Table 1. BSAI Groundfish Plan Team Recommendations for final OFL and ABC (metric tons) harvest specifications for 2011 and 2012.

		2010				2011			2012		
Species	**Area**	**OFL**	**ABC**	**TAC**	**Catch**	**OFL**	**ABC**	**TAC**	**OFL**	**ABC**	**TAC**
Pollock	EBS	918,000	813,000	813,000	809,238	2,450,000	1,270,000		3,170,000	1,600,000	
	AI	40,000	33,100	19,000	1,266	44,500	36,700		50,400	41,600	
	Bogoslof	22,000	156	50	131	22,000	156		22,000	156	
Pacific cod	BSAI	205,000	174,000	168,780	159,012	272,000	235,000		329,000	281,000	
Sablefish	BS	3,310	2,790	2,790	721	3,360	2,850		3,080	2,610	
	AI	2,450	2,070	2,070	1,049	2,250	1,900		2,060	1,740	
Yellowfin sole	BSAI	234,000	219,000	219,000	114,600	262,000	239,000		266,000	242,000	
Greenland turbot	Total	7,460	6,120	6,120	3,589	7,220	6,140		6,760	5,750	
	BS	n/a	4,220	4,220	1,706	n/a	4,590		n/a	4,300	
	AI	n/a	1,900	1,900	1,883	n/a	1,550		n/a	1,450	
Arrowtooth flounder	BSAI	191,000	156,000	75,000	38,098	186,000	153,000		191,000	157,000	
Kamchatka flounder	**BSAI**	**n/a**	**n/a**	**n/a**	**n/a**	**23,600**	**17,700**		**23,600**	**17,700**	
Northern rock sole	BSAI	243,000	240,000	90,000	53,111	248,000	224,000		243,000	219,000	
Flathead sole	BSAI	83,100	69,200	60,000	19,863	83,300	69,300		82,100	68,300	
Alaska plaice	BSAI	278,000	224,000	50,000	15,771	79,100	65,100		83,800	69,100	
Other flatfish	BSAI	23,000	17,300	17,300	2,179	19,500	14,500		19,500	14,500	
Pacific Ocean perch	BSAI	22,400	18,860	18,860	16,567	36,300	24,700		34,300	24,700	
	BS	n/a	3,830	3,830	2,267	n/a	5,710		n/a	5,710	
	EAI	n/a	4,220	4,220	4,033	n/a	5,660		n/a	5,660	
	CAI	n/a	4,270	4,270	4,033	n/a	4,960		n/a	4,960	
	WAI	n/a	6,540	6,540	6,234	n/a	8,370		n/a	8,370	
Northern rockfish	BSAI	8,640	7,240	7,240	4,039	10,600	8,670		10,400	8,330	
Blackspotted/Rougheye rockfish	BSAI	669	547	547	232	549	454		563	465	
	EBS/EAI	n/a	n/a	n/a	n/a	n/a	**234**		n/a	**240**	
	CAI/WAI	n/a	n/a	n/a	n/a	n/a	**220**		n/a	**225**	
Shortraker rockfish	BSAI	516	387	387	252	524	393		524	393	
Other rockfish	BSAI	1,380	1,040	1,040	676	1,700	1,280		1,700	1,280	
	BS	n/a	485	485	179	n/a	710		n/a	710	
	AI	n/a	555	555	497	n/a	570		n/a	570	
Atka mackerel	Total	88,200	74,000	74,000	68,643	101,000	85,300		92,200	77,900	
	EAI/BS	n/a	23,800	23,800	23,599	n/a	40,300		n/a	36,800	
	CAI	n/a	29,600	29,600	26,387	n/a	24,000		n/a	21,900	
	WAI	n/a	20,600	20,600	18,657	n/a	21,000		n/a	19,200	
Squid	BSAI	2,620	1,970	1,970	402	2,620	1,970		2,620	1,970	
Other species	**BSAI**	**88,200**	**61,100**	**50,000**	**21,783**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**
Skate	BSAI	n/a	n/a	n/a	16,419	37,800	31,500		37,200	31,000	
Shark	BSAI	n/a	n/a	n/a	47	1,360	1,020		1,360	1,020	
Octopus	BSAI	n/a	n/a	n/a	149	528	396		528	396	
Sculpin	BSAI	n/a	n/a	n/a	5,168	58,300	43,700		58,300	43,700	
Total	BSAI	2,462,945	2,121,880	1,677,154	1,331,222	3,954,111	2,534,729		4,731,995	2,911,610	

Notes: New (highlighted text) in 2011: 1) Kamchatka flounder category, 2) subarea specifications for Blackspotted/Rougheye rockfishes, and 3) separate Skate, Shark, Octopus, and Sculpin assemblage specifications replaces "Other Species" category; 2010 catches through November 6, 2010 from AKR Catch Accounting.

Council Recommendation on TACs with BSAI Plan Team proposed OFL and ABC recommendations (metric tons) for 2011-2012 (revised October 25, 2010)

		2010				2011			2012		
Species	Area	OFL	ABC	TAC	Catch	OFL	ABC	TAC	OFL	ABC	TAC
Pollock	EBS	918,000	813,000	813,000	787,027	1,220,000	1,110,000	1,107,000	1,220,000	1,110,000	1,105,000
	AI	40,000	33,100	19,000	976	39,100	32,200	19,000	39,100	32,200	19,000
	Bogoslof	22,000	156	50	52	22,000	156	75	22,000	156	75
Pacific cod	BSAI	205,000	174,000	168,780	128,510	251,000	214,000	207,580	251,000	214,000	207,580
Sablefish	BS	3,310	2,790	2,790	555	2,970	2,500	2,500	2,970	2,500	2,500
	AI	2,450	2,070	2,070	879	2,200	1,860	1,860	2,200	1,860	1,860
Atka mackerel	Total	88,200	74,000	74,000	43,008	76,200	65,000	65,000	76,200	65,000	65,000
	EAI/BS	n/a	23,800	23,800	13,549	n/a	20,900	20,900	n/a	20,900	20,900
	CAI	n/a	29,600	29,600	18,555	n/a	26,000	26,000	n/a	26,000	26,000
	WAI	n/a	20,600	20,600	10,903	n/a	18,100	18,100	n/a	18,100	18,100
Yellowfin sole	BSAI	234,000	219,000	219,000	94,144	227,000	213,000	213,000	227,000	213,000	213,000
Rock sole	BSAI	243,000	240,000	90,000	48,837	245,000	242,000	90,000	245,000	242,000	90,000
Greenland turbot	Total	7,460	6,120	6,120	3,201	6,860	5,370	5,370	6,860	5,370	5,370
	BS	n/a	4,220	4,220	1,386	n/a	3,700	3,700	n/a	3,700	3,700
	AI	n/a	1,900	1,900	1,815	n/a	1,670	1,670	n/a	1,670	1,670
Arrowtooth flounder	BSAI	191,000	156,000	75,000	34,267	167,400	139,300	60,000	167,400	139,300	60,000
Kamchatka flounder	BSAI					23,600	17,700	17,700	23,600	17,700	17,700
Flathead sole	BSAI	83,100	69,200	60,000	18,107	81,800	68,100	60,000	81,800	68,100	60,000
Other flatfish	BSAI	23,000	17,300	17,300	2,042	23,000	17,300	17,300	23,000	17,300	17,300
Alaska plaice	BSAI	278,000	224,000	50,000	13,402	314,000	248,000	40,000	314,000	248,000	40,000
Pacific Ocean perch	BSAI	22,400	18,860	18,860	12,465	22,200	18,680	18,680	22,200	18,680	18,680
	BS	n/a	3,830	3,830	873	n/a	3,790	3,790	n/a	3,790	3,790
	EAI	n/a	4,220	4,220	3,054	n/a	4,180	4,180	n/a	4,180	4,180
	CAI	n/a	4,270	4,270	3,352	n/a	4,230	4,230	n/a	4,230	4,230
	WAI	n/a	6,540	6,540	5,186	n/a	6,480	6,480	n/a	6,480	6,480
Northern rockfish	BSAI	8,640	7,240	7,240	2,116	8,700	7,290	7,290	8,700	7,290	7,290
Shortraker rockfish	BSAI	516	387	387	197	516	387	387	516	387	387
Blackspotted/Rougheye rockfish	BSAI	669	547	547	191	650	531	531	650	531	531
	BS						42	42		42	42
	AI						489	489		489	489
Other rockfish	BSAI	1,380	1,040	1,040	523	1,380	1,040	1,040	1,380	1,040	1,040
	BS	n/a	485	485	193	n/a	485	485	n/a	485	485
	AI	n/a	555	555	330	n/a	555	555	n/a	555	555
Squid	BSAI	2,620	1,970	1,970	65	2,620	1,970	1,970	2,620	1,970	1,970
Other species	BSAI	88,200	61,100	50,000	17,321						
Shark	BSAI				39	598	449	449	598	449	449
Skates	BSAI				13,080	35,900	30,000	30,000	35,900	30,000	30,000
Sculpin	BSAI				4,113	51,300	30,200	30,035	51,300	30,200	30,035
Octopus	BSAI				89	311	233	233	311	233	233
Total	BSAI	2,462,945	2,121,880	1,677,154	1,207,884	2,826,305	2,467,266	1,997,000	2,826,305	2,467,266	1,995,000

Sources: 2010 OFLs, ABCs, and TACs and 2011 OFLs and ABCs from harvest specifications adopted by the Council in December 2009; 2012 OFLs and ABCs equal 2011; individual other species from December 2009 SSC minutes, minor modifications from Council 2009 recommendations to other species and BSAI totals to conform to SSC other species recommendations; 2010 catches through September 11 from AKR Catch Accounting.

Minutes of the Bering Sea and Aleutian Islands Groundfish Plan Team

November 16-19, 2010
North Pacific Fishery Management Council
605 W 4th Avenue, Suite 306
Anchorage, AK 99501

Loh-Lee Low	AFSC, Chair	Yuk W. (Henry) Cheng	WDFW
Grant Thompson	AFSC, SSC liaison	Bill Clark	IPHC
Mike Sigler	AFSC, Vice-chair	Lowell Fritz	AFSC
Jane DiCosimo	NPFMC, Coordinator	Mary Furuness	AKRO
Kerim Aydin	AFSC	Dana Hanselman	AFSC
David Barnard	ADF&G	Alan Haynie	AFSC
Dave Carlile	ADF&G	Brenda Norcross	UAF
		Leslie Slater	USFWS

The BSAI Groundfish Plan Team convened on Tuesday, November 16, 2010, at 1:00 pm. All members contributed to assessment reviews. As many as 35 members of the public attended parts of the meeting.

Eastern Bering Sea Pollock

Jim Ianelli, senior author of the EBS walleye pollock assessment, presented an overview of this year's SAFE chapter. Major results include the following: Biomass estimates from both the bottom trawl survey and the acoustic-trawl survey were much higher this year than last year. Estimates of spawning biomass for recent years have gone up, and spawning biomass for 2011 is projected to be 25% above *BMSY*. Weights at age from the 2009 fishery were much larger than the recent 10-year average, meaning that fewer fish were harvested in 2009 than estimated in last year's assessment. The estimated strength of the 2006 year class has gone up, more in line with the estimate from the 2008 assessment than last year's assessment. The 2006 year class is estimated to comprise more than half of the total spawning biomass in 2010 (typically, no more than about 30% of the spawning biomass is contributed by a single year class). In addition, the 2010 acoustic-trawl survey showed signs of a strong 2008 year class. Because the large 2006 year class was produced when spawning biomass was low, the estimated slope of the stock-recruitment relationship has increased, which led to an increase in the estimate of *FMSY*. The estimate of *FMSY* would have increased even more, but the authors chose to ignore the 2008 and 2009 year classes in estimating the stock-recruitment relationship. The preliminary 2011 ABC as specified last year is 1.11 million t, and the authors are recommending a final 2011 ABC of 1.27 million t (a 14% increase) based on a five-year average harvest rate, which is well below the maximum permissible value of 2.15 million t. This stock is been managed under Tier 1.

In addition to the final model, the assessment included partial results from several other models. Some of these models were developed to examine which of the recent data had the largest impacts on results. Some of the data examined in this context were updated total catch, updated 2009 fishery average weights, updated age composition from the 2009 acoustic-trawl survey, and inclusion of annual estimates of relative precision for the acoustic-trawl time series. Of these, the assessment showed that the relative precision estimates had the largest impact on estimates of recent year class strengths. Other exploratory models included use of an ageing error matrix (last evaluated in the 2003 assessment) and an "acoustic vessels of opportunity" index which is intended to be used in next year's assessment to compensate for the lack of a 2011 acoustic-trawl survey.

Some other factors noted in the assessment include the following: Catch taken west of 170W has been increasing almost continuously since 1995. This was another cold year in terms of bottom temperature,

marking five years in a row of such conditions (compared to three years in a row for below-average surface temperatures). Euphausiid backscatter increased every year from 2004 through 2009, but was down slightly in 2010. Of the overall biomass estimated by the acoustic-trawl survey this year, only about 5% occurred in Russian waters (the percentage has been as high as 15% in previous years).

Team discussion focused on two issues. The first was the issue of whether the two most recent year classes should be ignored in estimating the stock-recruitment relationship. During the discussion of this issue, the following points were made (these are comments by individual Plan Team members and do not necessarily reflect Plan Team consensus):

1. If the recent year classes are excluded, this should be because the point estimates are too uncertain, not because they are large (i.e., consistency would require excluding recent year classes that are small and uncertain as well as those that are large and uncertain).
2. There are precedents for dropping the most recent recruitments from the time series in the case of Tier 3 stocks.
3. If the estimates of uncertainty associated with recent year classes are accurate, this uncertainty should propagate appropriately into the buffer between OFL and the maximum permissible ABC.
4. The confidence interval for 2010 spawning biomass estimated in last year's assessment does not include the point estimate from this year's assessment, indicating that uncertainty surrounding recent year classes may be underestimated by the model.
5. The desired level of conservatism, if any, should be built into the prior distribution for steepness rather than achieved by an *ad hoc* decision to ignore certain year classes.
6. Last December, the SSC cited several precautionary elements that are built into the EBS pollock assessment; if those precautionary elements are acceptable, perhaps the decision to ignore recent strong year classes when estimating the stock-recruitment relationship is also acceptable.
7. Perhaps there should be a policy that authors must always exclude some specified number of recent year class estimates when estimating the stock-recruitment relationship (or average recruitment, in the case of Tier 3 stocks).
8. Adoption of such a policy (see above) would require a decision as to whether the same year class estimates should be excluded from model projections.

After much discussion, the Plan Team decided to accept the model recommended in the assessment with the 2008-2009 year classes omitted in the estimation of the stock-recruitment relationship, without passing judgment on whether omission of these two year classes is appropriate. There were two main reasons for this decision:

In terms of harvest specifications, the choice of whether to include the 2008-2009 year classes affects only the OFL and the maximum permissible ABC. Even when the 2008-2009 year classes are excluded, the OFLs and the maximum permissible ABCs for 2011-2012 are all greater than the 2 million t OY cap for the overall groundfish fishery, meaning that the decision is largely academic for the present assessment.

The SAFE chapter does not include a complete set of results for the model with all year classes included, so there was really no other choice.

The Plan Team emphasized that this is a purely pragmatic decision for this year only and does not necessarily constitute a standing policy. The Plan Team also recalled its recommendation from last November that a workshop be held, or a working group be formed, to develop guidance regarding how to decide when a stock qualifies for management under Tier 1. The Plan Team believes that this recommendation should definitely be acted upon this year, with the terms of reference expanded slightly to develop guidance regarding which year classes to include in estimation of the stock-recruitment

relationship (for Tier 1 stocks) and which year classes to include in estimation of average recruitment (for Tier 3 stocks).

The other main item of discussion was the recommended ABC for 2011 and 2012. The assessment authors recommend setting ABCs for 2011 and 2012 below the maximum permissible level, specifically, at values corresponding to the average harvest rate over the most recent five complete years (0.332). Projected harvesting at this rate gives ABCs for 2011 and 2012 equal to 1.27 million t and 1.60 million t, respectively. Following discussion of the authors' recommendations and the maximum permissible ABCs, the Plan Team agreed with the authors' recommended ABCs. The Plan Team's primary reason for recommending ABCs well below the maximum permissible is the large hole in the age structure created by poor recruitments from the 2002-2005 year classes. While the Plan Team has recommended ABCs in excess of 2 million t in previous years when biomass was very high, the stock contained multiple large cohorts in those years, whereas about half of next year's catch is likely to come from a single year cohort (2006). Because recruitment is largely driven by environmental conditions, the Plan Team also felt that it would be advisable to take advantage of the present large biomass as a hedge against the possibility that the environment might return to the conditions that produced poor recruitment during the 2002-2005 period.

The Plan Team adopted the authors' values for 2011 and 2012 OFL, 2.45 million t and 3.17 million t, respectively. This stock is not being subjected to overfishing, is not overfished, and is not approaching an overfished condition.

In the context of ecosystem considerations, multiple sources of information indicate that EBS pollock biomass is increasing. Relative abundance of euphausiids, a key item in the diet of pollock, increased for several years through 2009. This indicates that pollock prey is generally abundant, while the slight downturn in euphausiid abundance observed in 2010 may indicate the beginning of top-down control resulting from increased pollock abundance. The current draft of the BiOp does not indicate that reductions in the EBS pollock ABC are necessary to avoid jeopardizing the recovery of species listed under the ESA.

Aleutian Islands Pollock

Steve Barbeaux presented an update of the Aleutian Islands pollock assessment. In 2003, Congress determined that the AI pollock TAC would be set at 19,000 mt or less and allocated to the Aleut Corporation by Congress and the CDQ groups. In 2010, only 55 t of pollock were taken in the directed fishery. About 1,000 mt of pollock were taken as incidental catch, primarily in the cod fishery.

New data for this year's assessment include a summer bottom trawl survey estimate, new age data and 2010 catch data. The author noted that Aleutian Island pollock otoliths are harder to read than Bering Sea pollock otoliths. Trawl survey biomass estimates indicate that over time pollock abundance has diminished in the western and central Aleutians, and increased in the eastern area.

The author presented two versions of the assessment model. One model was similar to models presented in previous assessments. The second version added an ageing error matrix. Biomass estimates for the most recent years are somewhat less than values estimated in the previous assessment, most likely due to the addition of the 2010 trawl survey biomass estimate. Biomass currently is at about 30% of the unfished value because recruitment has been low. Biomass has been increasing for about a decade and approaching the value expected with no fishing.

The Team accepted the revised assessment model with ageing error included. In general, the Team recommends inclusion of an ageing error matrix in the assessment model if ageing error information is available. The preference is known age comparison because a reader-tester comparison may underestimate the error rate and the statistical distribution of the error rate.

The Plan Team determined that there are no ecosystem considerations that would cause the Plan Team to recommend an ABC different from the author's recommendation for 2011 of 36,700 t.

Bogoslof Walleye Pollock

Steve Barbeaux presented a brief update of the Bogoslof pollock assessment. No survey was conducted in 2010. The ABC and OFL values are the same as last year. There is a Bogoslof survey planned for 2011.

Pacific cod

The joint Teams accepted the author's preferred Model B (see Joint Team Minutes). Therefore the remaining issue for the BSAI Team was the OFL and ABC recommendations and ABC area apportionments.

Mike Sigler accepted the model, but suggested that the values of natural mortality and trawl survey catchability were uncertain; he noted that the stock size estimates included a lot of small fish from incoming year classes. Bill Clark observed that the uncertainty of M and q were not very different from other assessments and had been fully discussed in September. Grant Thompson said that small fish were only a small part of the author's recommended ABC for 2011. The Team approved the author's recommended OFL and ABC, set according to the standard control rule for a Tier 3b stock. Still, because of the influence of the incoming 2006 and 2008 year classes on projected biomass, the Team notes that the 2012 estimate may be lower next year than projected this year.

Kerim Aydin observed that in the absence of an area apportionment between the Bering Sea and Aleutian Islands, the exploitation rate of cod in the Aleutian Islands continued to be about twice that in the Bering Sea (based on simple ratios of catch and survey abundance), and biomass continued to decline in the Aleutian Islands. A member of the public commented that for various reasons (including Steller sea lion mitigation measures) cod catches in the Aleutians were unlikely to increase and were very likely to decline in 2011. The Team is nonetheless still concerned about the disproportionate exploitation of cod in the Aleutian Islands and recommends the earliest possible implementation of separate area ABCs.

Applying the Kalman filter approach to the updated (through 2010) time series indicates that the best estimate of the current biomass distribution is 91% EBS and 9% AI, replacing the previous proportions of 84% and 16% respectively.

The author informed the Team of his plans to develop a separate AI Pacific cod assessment in the near future.

Yellowfin sole

Tom Wilderbuer summarized the results of the assessment, noting changes to the input data. In contrast to last year's gender specific model, this year's model incorporated both gender and time specific selectivities. Catch history was reviewed, noting the particularly high foreign catches during the early years of the fishery. Plots of cumulative weekly catch indicated the similar pace of the fishery over the last few years, with the exception of 2007 when there were a number of closures due to halibut bycatch. A progression of maps displayed monthly changes in commercial catch locations for yellowfin, with catches distributed broadly near the western edge of the shelf early in the year, and becoming more focused toward the southern end of the shelf, and to the east of the shelf edge, as the year progressed. In 2009, 95% of yellowfin sole was retained.

Tom highlighted the utility of a gender-specific model by showing plots of differential growth patterns for males and females, females becoming heavier at age than males. The bottom trawl survey biomass estimate for yellowfin sole increased 36% between 2009 and 2010. Age composition plots indicated generally greater proportions of older fish in the fishery, compared to the survey. Tom noted the large 2003 year class.

Alternatives for using three different stanzas of spawner-recruit data to define the S-R relationship were mentioned. As a precautionary measure, data from the 1978-2003 period were used in estimating the relationship. The benefit, and success, of using bottom temperatures to model catchability was emphasized. Nine alternative models were used to evaluate the influence of different approaches for determining natural mortality (M) and catchability (q). The authors recommended - and the Plan Team supported - the use of the 2010 BASE model in which M was fixed (0.12) and q estimated based on bottom temperature.

Tom elaborated on the use of a fixed vs. estimated M as part of the model evaluation. An alternative model, which allows M for males to be estimated with the M for females fixed, yielded a good fit to the observed sex ratio. But the observed sex ratio during the survey is influenced by spawning in inshore areas and fitting the model to these sex ratios may not provide the most representative indication of the actual sex ratio. Therefore, the preferred model estimates q from the relationship between bottom temperature and survey catchability, with M fixed (=0.12) for both males and females.

The estimated selectivity for 2010 was used to estimate the 2011 ABC. Mike Sigler suggested the possibility of estimating selectivity in 4-year blocks (as was done by Paul Spencer for the POP assessment), rather than annually. Grant Thompson mentioned that for EBS pollock, constraints were placed on annual estimates of selectivity, and Tom indicated that constraints were also used in estimating annual selectivity for yellowfin sole.

In examining the fit of the modeled to observed biomass it was noted that the model estimate below both the 2010 survey point, and lower bound of the interval, estimates. Estimated female spawning biomass continues to trend toward the B40% level. Addressing recruitment, the strength of the 1981 and 1983 year classes and their continued contribution to the fishery was noted, along with suggestion that the 2003 year class would hopefully be fairly strong.

The Plan Team discussed the potential merits and ramifications of different approaches to estimating time varying fishery selectivity. The author estimated time-varying selectivity on an annual basis. This was contrasted with the approach used for some other species, such as Pacific Ocean perch, in which fishery selectivity was estimated in 4-year blocks. For population projections, the selectivity from the most recent year was used by the author. One reason given for using the most recent year was that this approach provided the largest buffer between the OFL and the ABC. The merits of this approach versus alternatives such as using an average of years were discussed at some length. A few Plan Team members (Cheng, Clark, Sigler, Hanselman) suggested considering the use of a mean of selectivities from recent (e.g. 2-5) years. Dana Hanselman suggested that retrospective analyses, using different sets of years for average selectivity, might be useful in evaluating the merits of averaging selectivities. Grant Thompson pointed out that the use of average selectivities would not affect the buffer between OFL and ABC, although it would affect the projections.

The Plan Team concurred with the use of the authors-recommended model, OFL and ABC. No specific ecosystem considerations were noted.

Plan Team recommendations For the next yellowfin sole assessment the Plan Team recommends that the author investigate using averaging selectivities for purposes of making projections.

Greenland turbot

Jim Ianelli highlighted recent trends in Greenland turbot abundance indices, catch, and quota. Quotas and catches have been at low levels. Catches increased from 2008 to 2010 due largely to greater catch of Greenland turbot in the arrowtooth flounder fishery. Survey catches from the 2010 Bering Sea shelf and slope surveys increased, substantially on the shelf. The longline survey index and AI trawl survey estimates of abundance declined. The AI index is not used in the assessment but is used for apportioning the biomass.

The author reviewed how a previous version of the stock synthesis model accounted for the influence of high historical catches in the foreign fishery by introducing a single large recruitment. That feature was lost in subsequent versions of SS until the most recent version in which it is again incorporated.

The BS shelf trawl survey abundance increased markedly, apparently due to a very big recruitment, which is strongly suggested by a high proportion of small fish (most likely age 1 fish) from the survey. This greater abundance is also reflected in the percentage of survey tows which had Greenland turbot; this percentage has generally ranged around 15 to 20%, but increased to more than 35% in the 2010 survey.

The patchy and yearly variation in the distribution of Greenland turbot is probably influenced partly by the extent of the cold pool with a heavy concentration of fish along the 0 degree isotherm. In the AI most of the turbot biomass is concentrated in the eastern AI, as evidenced by higher bottom trawl survey CPUEs.

In contrast to last year's relatively conservative ABC recommendation, this year the author recommends a full Tier 3a ABC designation. The author highlighted the dual length frequency modes in the fishery attributable to growth differences between sexes. The differential growth of males and females is reflected in surveys, contributing to varying sex ratios among years. In recent years there have been more males in the trawl survey. The proportion of females in the catch has varied considerably over time with males more prevalent in trawl catch and females, in longline catch. More fish have been consistently caught in the EBS trawl surveys in the 400-600 m depths which may be attributable to sexual segregation of fish, with males aggregating in that depth range. Sex specific changes from year to year contributed to variability in the area swept survey results.

With reference to the apparently strong recruitment reflected in the age compositions, Mike Sigler asked whether there could be some smearing of strong year classes, with contribution from more than a single year class to the apparent strong recruitment. The author responded that this level of recruitment has not been seen in awhile so this is probably not a case of smearing of more than one age class. Jane DiCosimo called attention to the differing trends of the surveys, with the trawl surveys showing varying degrees of increase, while the longline survey continued to show declines and was at the lowest level on record. Given the trends in abundance, and other changes taking place in the AI noted by Kerim Aydin and Mike Sigler, Jane stressed the importance of having future surveys in the AI. Kerim commented that the changes in the AI noted during the discussion provided impetus for him to revisit a guild analysis for the area. Mary Furuness noted that the OFL was applied to the BS/AI while the ABCs were applied to separate areas – i.e., EBS and AI.

The Team noted updates of the model, including modifications to the SS3 version from last year. The main modification was a change from using individual recruitments during the 1960s, to applying an expected recruitment value to 1960-1969. It was noted that the ABC - similar to last year – was appropriate given the model results. The substantial increase in new recruits was again noted, along with the apparent influence of these recruits on overall increased abundance of Greenland turbot. The Team supported the author's recommendations for ABC and OFLs for 2011 and 2012.

Plan Team recommendations. The Team strongly recommended that the 2012 AI trawl survey be conducted.

Arrowtooth Flounder

Input data of the present assessment includes arrowtooth flounder only as this assessment is no longer for the *Atheresthes* complex. Input data were updated with the inclusion of fishery catch and discards through 15 Oct. 2010. New data also included 2010 shelf, slope and Aleutian Islands surveys size composition and biomass point-estimates and standard errors. Estimates of retained and discarded portion of the 2009 catch were added. The current model includes the Aleutian Islands, Bering Sea slope and Bering Sea shelf. The biomass is modeled with 76% of the stock on the shelf, 14% in the Aleutian Islands and 10%

on the Bering Sea slope. The author presented the same model as last year. There is no comment from Plan Team.

Kamchatka Flounder

Tom Wilderbuer presented the first stock assessment model of Kamchatka flounder with Tier 5 status. In the eastern part of their range, Kamchatka flounder overlap with arrowtooth flounder which are very similar in appearance and were not routinely distinguished in the commercial catches until 2007. Until about 1992, these species were also not consistently separated in trawl survey catches and were combined in the arrowtooth flounder stock assessment. However, managing the two species as a complex became undesirable in 2010 due to the emergence of a directed fishery for Kamchatka flounder in the BSAI management area. Since the ABC was determined by the large amount of arrowtooth flounder relative to Kamchatka flounder (complex is about 93% arrowtooth flounder) the possibility arose of an overharvest of Kamchatka flounder. ABC exceeded the Kamchatka flounder biomass. In addition, observers can distinguish between arrowtooth and Kamchatka flounders when they have it in hand. He proposed to use 7 years running average of biomass. Due to the high catch of Kamchatka flounder in a small area around the eastern AI, the Plan Team recommended the authors report the catch and exploitation rate of both EBS and AI in the next year stock assessment and explore the option of apportionment between the above two areas.

Northern Rock Sole

The 2009 fishery and survey age comps were added to the model. The survey biomass is 34% higher than last year. The catch last year was ~53,000, 25% of ABC, an exploitation rate of <0.04. Rock sole are heavily fished for roe in February and March. Catch is limited by the demand for row. Otherwise rock sole is bycatch of the yellowfin sole fishery.

An improvement to the model this year is the addition of time-varying length at age. Rock sole size stanzas were used. NRS were larger in 1982-91 and smaller in 1992-2003. There appears to be a density dependent component in the size changes. Length-at-age changes the model results. This is critical; it is important in the model and is only done for NRS and Pacific halibut. Weight changes at age 6-7, maturity. At that time females become larger than males. Bill Clark asked for an explanation of the length-at-age model. It is summarized as a plot of length converted back to age. There are a lot of small fish out there in both the fishery and the survey.

Author recommends Model 1, the base model fixes q=1.5. The split -sex model that was implemented last year is used. Sex ratio = 50:50 in survey. In summer during the survey, NRS are spread across shelf feeding, evenly distributed. In winter spawning is at the shelf break. There was good recruitment early 2000s and low recruitment late 1990s. Time varying changes in model for fishery selectivity makes the population estimate appear to go up 34%.

The SSC expressed concern over the narrow range between the ABC and OFL estimates in the past few years. They recommended convening a workshop to explore formal procedures to address the situation. A workshop has not yet been scheduled, but the authors addressed the issue through the use of a time-varying fishery selectivity, which increased the buffer between ABC and OFL from 1.4% in 2009 to 9.6% in 2010.

There are no ecosystem effects of concern. There is little to no information on availability of food, which is polychaetes; production levels are unknown. The team noted that there appears to be a density-dependent effect that caused length-at-age differences.

Flathead Sole

The flathead sole/Bering flounder stock assessment was presented by Buck Stockhausen. Recent trends in the fishery show catch has decreased slightly from 2008 and retention has increased. Prohibited species catches were similar to those in recent years. Additional information on bycatch of non-prohibited species and catch by gear type and statistical area were also presented.

Bill Clark asked about field identification of Bering flounder and was told gill raker count was the definitive characteristic. Color and shape are also used in areas away from species overlap. Current estimates of misidentification are about 1%. The patterns of fishery and survey catches do not match well. This may be due to the patchy distributions of both species, possibly an association with undersea canyons. Fishery size compositions showed little change in the pattern of sizes with no clear evidence of recruitment.

The 2010 Bering Sea survey included an extension into the northern Bering Sea. Bottom temperatures were slightly warmer than the last few surveys. The biomass estimate of just over 507,000t represents a 19% increase from 2009, possibly a temperature effect. There was about a 2% increase in biomass in the Aleutian Islands of which about 2% is Bering flounder. No flathead sole were observed in the northern Bering Sea and Bering flounder were most abundant west of St. Lawrence Island. There was little difference in age and size composition from the 2009 survey.

The base assessment model was the same as last year and the authors are developing a new model they hope to present next year. Data updates included updated 2009 and size compositions and the most recent 2010 age and size data, and data from the 2010 eastern Bering Sea and Aleutian Islands surveys. Four models were examined: 1) the base model from last year, 2) the base model without temperature-dependent catchability (TDQ), 3) the base model with a Ricker stock recruitment function, and 4) the base model with a Beverton-Holt stock recruitment function. Except differences in biomass estimates, all four models get near identical results. Generally, the base model which included TDQ gave the best fit and Buck recommended remaining in Tier 3.

The model results showed different size selectivity curves for the survey and fishery with the 50% selectivity occurring at a larger size in the fishery. The spawning biomass remained flat and there was a slight decrease in the total biomass. There appeared to be good recruitment from the 2007 year class. The current assessment differed little from recent past assessments. A five year projection of average fishing mortality indicated overfishing is not occurring. The authors recommend an OFL of 83,321t and an ABC of 69,348t for 2011.

Abundance of Bering flounder is trending down, but estimates from the northern Bering Sea are equal to the standard surveys which may help to offset the decline. Size compositions for Bering flounder indicated a possible recruitment from the 2010 year class which was absent otherwise. This recruitment event was present in all three survey areas.

Mike Sigler asked if there was a problem with average recruitment in the model relative to Tier 3. Kerim noted there were similarities with other flatfish. Buck pointed to differences in breaks in the time series.

The Plan Team agreed with remaining in Tier 3 and accepted with the author recommended OFLs and ABCs.

Alaska Plaice

Changes to the assessment this year are added shelf survey data and age composition. Because there is no fishery for Alaska plaice, there are no fishery data. The exploitation rate is <1%. The survey area in 2010 was expanded to include not only the standard EBS and the NW (Northwest) areas, but also the north Bering Sea (NBS) where 38% of the biomass was found. The total survey biomass estimate decreased slightly from last year.

Last year a split sex model was assessed. The SSC requested the authors to estimate sex-specific natural mortality. In the past, the authors always used 0.25 based on northern rock sole. AK plaice live long so that M should be lower. Wilderbuer tried to figure out what M really was by first examining literature values for M. numbers. Bill Clark asked if he fixed q to estimate M. Tom did not do that; he did profiling. The result was that M was revised downward from 0.25 to 0.13 for both sexes. This makes F lower, more like a flatfish. These fish live long and should have lower F.

In past assessments, the authors assumed there was a herding effect and q was changed to compensate for that. Last year q was 1.2. However, because 38% of the total survey biomass was in northern Bering Sea, they now assume the 2010 survey actually sampled all AK plaice distribution area. Everything is based on past estimates when they had to adjust for stock being outside of survey area. Bill Clark suggests that the stock is not mixed and because there is no fishery there is a huge unexploited component in the NBS. He suggested that the unexploited component should not be considered part of stock assessment.

Recruitment has been flat over recent years, not going up. There was good stock recruitment 2002-2003, coherent with yellowfin sole, northern rock sole and Greenland turbot. Cause unknown.

Grant Thompson said that the big F before (reference) not just because M was high, but because AK plaice mature ~5 years before recruit to fishery and have spawned a lot before caught. FOFL change to 0.19 from 0.77 because age comp estimate of M is now much lower. It now fits idea of a flatfish kind of species. Mike Sigler noted that trawl catchability is now reduced 1.2 to 1.0 and it does not matter because it is lightly fished. Now we know there appears to be a northward limit to distribution. Discuss if there are biological limits or catchability limits. This time it is balanced. Consider if the stock was being fished. AFSC plans to do expanded fishery survey to this northward area in 2013 so that will add more data to examine this concept. Henry Cheng believes M = 0.25 is really high; the new estimate of M is more realistic because of examining the growth parameters. Male k is estimated low, because t0 = -4. The team discussion whether to force it through 0.

Other Flatfish

This is a non-target species complex with an annual catch of ~2000 T captured as bycatch. From 1982 to 2009 there was change in trends of species caught. Originally it was composed mostly of longhead dab, but now it is mostly starry flounder. In the past the SSC expressed concern about catches of butter sole; the Plan Team determined it is not a concern. The exploitation rate of butter sole decreased from 0.31 in 2009 to 0.08 in 2010. An Aleutian Island survey was conducted in 2010.

The author showed data and plots on Sakhalin sole in northern Bering Sea. We pondered if they are moving north. Tom thinks they are a western species. There is little ecosystem knowledge about Sakhalin sole in the Bering Sea.

Pacific Ocean perch

Paul Spencer presented the BSAI Pacific ocean perch (POP) assessment results. Paul first showed a summary slide to show that the major model changes were an evaluation of time varying fishery selectivity, updating of growth curves, and recomputing the age/length conversion matrix. New data added were the 2010 AI survey biomass estimate and length composition, 3 years of fishery age composition, and a survey age composition. He then showed that there was a large increase in AI survey biomass (46%). Since 2002 there has been an increase in biomass estimates. This increase was seen in all areas of the AI. The largest area of increase was in the Southern Bering Sea. He showed that in the survey age compositions, there were signs of fairly consistent strong recruitment recently. He looked at three potential models where Model 1 is the 2008 model, Model 2 is time varying fishery selectivity in four year blocks, and Model 3 uses a constant fishery selectivity curve. He looked at the models based on the AIC and found that Model 2 performed best because of far fewer parameters. The patterns of time varying selectivity looked consistent between Models 1 and 2. POP are generally caught in deep water when they

are abundant. This is likely why there are changes in fishery selectivity over time as older fish are deeper. Grant Thompson asked why some assessments are doing different things, some use oceanographic regimes, constant increments or blocks, or annual varying. Paul does not think that is sensible to do this every year when the fishery is not likely changing every year. Bill Clark said that the goal is to best estimate catch-at-age, so in some cases annually varying can be good, but thinks this approach is good too. Paul next showed exploratory runs to evaluate the effect of new information. A total of six additional runs were conducted with different sets of data. Dave asked what the difference was between A1 and 2008 model. 2008 is the actual 2008 model run through 2008, A1 is run through 2010. The survey biomass estimate in 2010 does not change the catchability, but the age and length comps do. He is recommending Model 2 where the catchability goes down relative to the 2008 model value of 1.57. Dana Hanselman asked why there is no model excluding the 2010 length composition. Paul described that one of the reasons for the abrupt change in results was not having an AI survey in 2008. He said a 2008 biomass estimate might have mediated this change. He showed a time series of recruitment for Model 2 compared to the 2008 model where the whole series of recruitments shifted up with the addition of new data. He then showed the phase plane plot. He then showed summary table. Paul and his coauthor think that this increase is real based on age and length compositions and survey biomass increases. He then showed the apportionment and noted that the EBS increased pretty substantially. The apportionment is based only on the Aleutian survey, with no population status estimates from the EBS. Mike Sigler suggested we review the evidence for the big jump in ABC. Mike asked if the previous predicted biomass went above the historic points as it does now. Paul said he thought so. Dana asked about what new data supports the large increase in historic recruitment. Paul thought that while the model doesn't fit the new composition data perfectly, there is probably some information in there. Paul showed that when you compare the fishery and survey data from 2006, the same year classes show up. Jon Warrenchuk thinks the methodology for apportionment to the BS is looking at a small part of the BS that extrapolates over the whole Bering Sea. There is some concern that level of apportionment could lead to localized depletion in the northern Bering Sea. Second, this large increase in ABC could have potential impacts on EFH or other ecosystem analyses that did not consider this much take in the Aleutian Islands. Lastly, on the discussion of bycatch, this fishery catches a lot of Atka mackerel, which could be problematic due to the SSL Biological Opinion (BiOp). Mary Furuness said the unallocated bycatch is minimal. The SSL BiOp is likely to prevent retention of Atka mackerel, so there won't be targeting. She said it was still possible that an increase could occur. She thinks a lot of the incidental catch you see of Atka is actually topping off, not accidental bycatch in 543. Steve Whitney said that the historical catch of Atka in the POP fishery is not high. Mary said that bycatch from 2008 onward is the relevant data set because of changes in regulations. Paul corrected from earlier, the apportionment does not use the EBS slope survey to apportion catch. Mary said we did not open POP in the Bering Sea this year to the Amendment 80 fleet, and will probably do it again next year with this high of a TAC. Jane DiCosimo reiterated that if we had an AI survey in 2008, this might not have looked so abrupt. Paul presented that the average of survey projections until 2023 as an intermediate value. Grant suggested that we have used stair steps in the past. Dana said he would like to see some type of intermediate value based on the sensitivity of the model and the catchability estimate to one new survey biomass estimate and new compositional data. Henry said that there is either a problem with the survey or the model to predict such a large change for a long-lived species. Mike said that we would like to see a confirmatory survey to go to the full ABC. It was noted that it has been said that we are not supposed to give best estimates and not conservative estimates. Dana said that when a model gives you an answer that is outside the bounds of biology, then it is sometimes necessary to choose a different model or to make a temporary adjustment whether up or down. Grant said stair step numbers were one way to do this. Mike suggested a stair step to be flat for two years until we get an additional AI survey. Dana said to use the 2013 full ABC when doing specifications in 2011. The group agreed to a stair-step half-way to 2011 ABC for two years until we see a new 2012 AI survey.

Northern Rockfish

Paul Spencer presented the 2010 northern rockfish assessment; the last full assessment was presented in 2008 with an updated assessment in 2009. Changes to the current assessment relative to the 2008 assessment included data updates and some changes in methodology. Data updates were the 2010 catch, biomass and length composition for the 2010 Aleutian Islands (AI) survey, the 2006-2007 fishery age compositions, and the 2008-2009 fishery length compositions. Changes to the assessment methodology consisted of estimating the fishery selectivity curve without constraining the parameters to be similar to the survey selectivity curve, re-estimation of the growth parameters, and reducing the years in which recruitment for recent year classes is not estimated from 7 years to 3 years.

The 2010 AI survey biomass estimate of 217,319t was very similar to the 2006 estimate (217,975t), the spawning biomass has been slowly increasing over the past decade and F has been decreasing. The spatial pattern of the 2010 survey CPUE is similar to previous surveys. The age of 50% selectivity for the fishery is 12 years relative to 6.4 years for the survey. Changes in selectivity have resulted in increases in FOFL and FABC of 39% and 35%, respectively.

Bill Clark noted that the model consistently underestimates the early fishery age compositions and overestimates the age compositions for ages 20 and above. Paul responded that this discrepancy is due to the influence of the 23+ age group which is typically quite large.

Grant Thompson pointed out that the error bars for the estimated recruitment graph had the same height as the number of recruits for several years and asked about the window of exclusion. Mike Sigler noted that the CVs are consistent so all the data should be retained. Paul responded that the years of strong recruitment behave well in the model.

The Plan Team accepted the model which was similar to last year's model. Ecosystem considerations concerning the AI/Bering Sea split were noted. The author-recommended 2011 and 2012 OFLs and ABCs were accepted by the Plan Team.

Blackspotted/Rougheye rockfish complex

Given the uncertainty in recent recruitments and their influence on B40%, Spencer considered various options: i) adjusting the input weight on the 2009 fishery and 2010 survey length compositions; ii) adjusting the input variance of recruitment residuals; and iii) excluding recent high uncertain recruitment estimates from the computation of B40%. The Plan Team decided to use only the recruitment estimates of the 1977-1995 year classes in the calculation of B40% because the uncertainty of recruitment estimates after 1995 increases greatly. The Plan Team recommends that this stock qualifies for management under Tier 3 due to the availability of reliable estimates for B40%, F40%, and F35%. Because the female spawning biomass of 5,800 t is over B40%, (4,739 t, AI only), sub-tier "a" would be applicable, FFOL=0.041 and FABC=maxFABC=0.034., and is different from the sub-tier "b" adopted last year. The Plan Team recommends allocating the ABC to two areas: 1) Western and Central AI area and 2) Eastern AI and EBS area. The rationale for this recommendation is that the available information on stock structure for blackspotted rockfish indicates an 'isolation by distance' pattern without clear physical breaks in stock structure, and this division of the ABCs results in management areas that are more consistent with the available information on stock structure. Although the current pattern of harvest does indicate disproportionate harvesting within the western Aleutians, the Plan Team did not feel the scale of harvests in this area warranted a separate western AI ABC at this time.

Shortraker rockfish

Paul Spencer presented results from the 2010 shortraker rockfish assessment. He said there were no model changes for shortraker rockfish. He showed spatial maps of survey CPUE noting that it is patchy. The model is a Kalman filter fit of a surplus production model to the survey biomass estimates. The

survey biomass estimate increased about 50% from 2006. Estimated fishing mortality has been typically quite low, at about ½ of what you might expect F_{ABC} would be if it were managed under Tier 3. He thinks this would be a good candidate to look at for stock structure template because of the catch patterns in the Bering Sea versus the Aleutian Islands. The Plan Team approved the author's ABC and OFL recommendations.

Other rockfish

Paul Spencer presented other rockfish and proposed a new weighted average of the most recent surveys used to compute average biomass for apportionment which is similar to Gulf of Alaska apportionment using a 9:6:4 weighted average of the last three surveys. "Other rockfish" is all *Sebastes* and *Sebastelobus* species, except for Pacific Ocean perch, and rougheye, blackspotted, northern, and shortraker rockfishes. New data are 2010 estimates of survey biomass. The Aleutian Island biomasses decreased in 2010, while the slope survey increased. The largest proportion of both areas' biomass is short-spine thornyhead (SST). Both areas are on an upward trend overall. 0.03 is used for SST natural mortality and 0.09 for non-SST species. ABC and OFLS increased for 2010. The Plan Team endorses the ABCs and OFLs recommended by the authors.

Squid

Olav Ormseth presented an updated chapter, which included new information that described the seasonal pattern of incidental squid catches. The Plan Team agreed with the author's OFL and ABC recommendations, which were unchanged from last year.

Skates

Olav Ormseth presented an updated assessment. No changes were made to the Alaska skate assessment and other skate biomass was estimated from the three most recent surveys. The Bering Sea shelf has the lowest species diversity, the Aleutian Island area has mostly Aleutian and whiteblotched skates, and the slope has the highest species diversity. The Plan Team agreed with the author's OFL and ABC recommendations based on the sum of Tier 3 for Alaska skates and Tier 5 for other skates. The Plan Team scheduled a discussion of separate management of Alaska skates and "other skates" for September 2011.

Shark

During the joint Plan Team discussion the BSAI Team agreed to a Tier 6 rule with OFL set at the 90th percentile of the total shark catch. Later the Team agreed on a Tier 6 rule with OFL set at the maximum catch for octopus and decided to revisit the shark OFL. After some discussion the Team agreed that there was no good reason to use the maximum catch in one case and the 90th percentile in another, and that it would recommend OFL set at the maximum catch of all shark species. In the BSAI, the 90th percentile would have been 764 mt, taken in 2001. The maximum catch is 1,362 mt, taken in 2002. Since 2002, the annual shark catch has averaged 355 mt (Table 3 in the SAFE chapter). With OFL = 1,362 mt, ABC = 0.75*OFL = 1,022 mt.

The only species of concern in the BSAI is sleeper shark. Dogfish are rare this far north and caught in only small numbers. Salmon sharks are pelagic and therefore not vulnerable to most fisheries. Some are taken in the pollock fishery, but they constitute only about 10% of the total take. Sleeper sharks constitute 70% of the total catch, taken mainly in the pollock and Pacific cod fisheries. They are certainly vulnerable to those gears.

A Tier 5 OFL for sharks is not possible because sharks are rarely caught in trawl surveys except for the Bering Sea slope survey, where sleeper sharks are taken in about 10% of hauls. Salmon sharks are almost never seen in trawl survey catches. While the trawl survey estimates are not reliable, Henry Cheng suggested that it would be possible to calculate the average swept area estimate of absolute abundance

from all surveys (shelf, slope, Aleutians) to see whether it could provide the Tier 6 OFL. The average estimate is 10,000 mt (Table 12 of the SAFE chapter), almost all consisting of sleeper sharks. With M = 0.097, a Tier 5 OFL for sleeper sharks would be 970 mt, approximately equal to 70% of the OFL for all sharks. So while not usable for a Tier 5 determination, the survey data suggest that there is at least enough biomass to provide the OFL.

Sculpins

Olav Ormseth presented a straightforward update from last year, with revised catch data and 2010 survey results. The team endorsed the author's application of revised life-history information for separate M estimates for 7 species, and different M estimates for the EBS and AI. The Team accepted the author's recommendations.

Octopus

Liz Conners presented an update of the BSAI assessment. The author computed ABC and OFL values using tier 6 average and maximum 1997-2007 catch. The Plan Team felt that separating octopus into its own management category for 2011 provided sufficient conservation for this group at this point and that adopting an OFL based on average catch was not necessary given that this group is caught incidentally.

Adjourn The Team adjourned on Friday at 4:00 pm.

Minutes of the Joint Plan Teams for the Groundfish Fisheries of the Gulf of Alaska and Bering Sea Aleutian Islands

November 15-16, 2010
North Pacific Fishery Management Council
605 W 4th Avenue, Suite 306
Anchorage, AK 99501

The joint meeting of the BSAI and GOA groundfish Plan Teams convened Monday, November 15, 2010 at 9:00 am at the Alaska Fisheries Science Center in Seattle, Washington. Members of the Plan Teams present for the meeting are listed below.

Loh-Lee Low	AFSC REFM (BSAI chair)	Jim Ianelli	AFSC REFM (GOA co-chair)
Mike Sigler	AFSC (BSAI Vice chair)	Diana Stram	NPFMC (GOA co-chair)
Kerim Aydin	AFSC REFM	Sandra Lowe	AFSC REFM
Lowell Fritz	AFSC NMML	Chris Lunsford	AFSC ABL
David Carlile	ADF&G	Jon Heifetz	AFSC ABL
Alan Haynie	AFSC REFM	Mike Dalton	AFSC REFM
Jane DiCosimo	NPFMC (Coordinator)	Kristen Green	ADF&G
Yuk. W. Cheng	WDFW	Tom Pearson	NMFS AKRO Kodiak
Brenda Norcross	UAF	Nick Sagalkin	ADF&G
Mary Furuness	NMFS AKRO Juneau	Paul Spencer	AFSC REFM
Grant Thompson	AFSC REFM	Leslie Slater	USFWS
David Barnard	ADF&G	Nancy Friday	AFSC NMML
Leslie Slater	USFWS	Yuk. W. Cheng	WDFW
Dana Hanselman	AFSC ABL	Sarah Gaichas	AFSC REFM
Bill Clark	IPHC		

Absent GOA PT members: Bob Foy, Ken Goldman, Steven Hare

Agenda

The Teams adopted the proposed agenda.

Council update Jane DiCosimo summarized recent Council actions related to Observer Program restructuring and the Steller sea lion Biological Opinion and revised Reasonable and Prudent Alternatives. The Team concurred with a Council recommendation to add Observer Program staff to the Plan Teams. The Council also initiated a potential joint FMP amendment to move BSAI and GOA octopus into the ecosystem component category of the FMPs and/or set discard mortality rates for octopus. Diana Stram reported on final action on crab and scallop ACLs and the PIBKC rebuilding plan, which may limit incidental removals of crab in the groundfish fisheries.

Future Council Tasking Grant Thompson reported on his plans for development of a discussion paper to address groundfish scientific uncertainty under Annual Catch Limit requirements for SSC review in June 2011. He also addressed last year's recommendations by the joint Plan Teams to convene a working group to address determinations of when stock-recruitment relationships are reliable for Tier 1

determination. Diana reported that a crab modeling workshop is scheduled for February 2011 to discuss similar recurring issues for moving crab stocks to Tier 3. Jim Ianelli noted that a national work group (of which he is a member) on improving stock assessment methods plans to address this issue in 2011. Jim also reported on a March 2011 international meeting on stock/recruitment relationships. The results of these discussions will be reviewed by the joint Plan Teams in 2011, perhaps in conjunction with the September 2011 Plan Team meeting.

The Teams briefly discussed a separate work shop requested by the SSC in December 2009. The SSC suggested broadening the scope of the Plan Team workshop to develop approaches to quantify and incorporate uncertainty in stock assessments that estimate recruitment. Plan Team members will participate, if requested.

Plan Team meeting dates The Teams identified the dates for the September 2011 meeting as August 29 – September 2, to minimize conflicts with several other scientific meetings that will occur in September 2011. This earlier meeting timeline means that neither survey results nor ecosystem reports will be available for review. Authors are reminded of this earlier timeline when preparing any new assessments. A stock structure discussion may be scheduled for that meeting. Dates for the November 2011 meeting dates are November 14 -18.

Total catch accounting update: Jane DiCosimo summarized the recommendations from a Plan Team working group on Total Catch Accounting that met via conference call on November 3. The group focused on several issues: 1) Survey data: a) conversions from numbers to lb and b) time period for historical data; 2) Inside State waters harvests; and 3) Report out to Plan Teams. The group recommended that a subgroup be formed to develop draft conversion protocols for incomplete (size data) survey data sets. The group noted the decision for including historical data is not a technical issue, but the question of what historical time period should be included should be referred to policy makers (i.e., Council or NMFS). The working group concluded that inside water harvests should not be included in TCA since those populations are not included in the biomass estimate in the stock assessments. The TCA working group will meet again by teleconference on February 9, 10, or 11, 2011 (TBA) to review sub-group reports on conversion methodologies and the stock inventory. This topic may be addressed again during the May 2011 Joint Plan Team teleconference (to review Pacific cod model proposals).

Essential Fish Habitat

The Council is proceeding with FMP amendments that were reviewed by the Plan Teams last year, and that were documented in the 5 year review report (approved by the Council in April 2010). For the most part, the amendments will implement the recommended changes identified by the stock assessment authors that were reviewed by the Plan Teams. Council staff will coordinate with individual authors during December and January to finalize the FMP amendment language. If anything comes up that seems outside of the purview of what the Plan Teams already reviewed, staff will consult with the Plan Team chairs. Initial review of the amendment package is scheduled for February 2011.

The Council call for HAPC proposals on skate nurseries is ongoing. The NMFS proposal is being reviewed for economic and enforcement issues; the Plan Teams already reviewed it for ecological merit. The Council will decide in February 2011 whether to initiate an amendment to implement the areas as HAPCs, and whether any conservation management measures should be associated with those areas. The EFH 5 year review contained Plan Team recommendation for EFH conservation measures to protect sablefish. The Council requested further discussion, which will come up under the sablefish assessment (below).

Sablefish

Dana Hanselman presented the sablefish assessment, including overviews of the changes for this year, the abundance indices and data used in the model, comparisons of results from different model

configurations, projections and harvest recommendations, and future directions for the assessment. In addition, a separate report related to sablefish recruitment was presented at the request of the Council.

Following recommendations of the CIE reviewers and Plan Teams, the longline survey relative population weight (RPW) indices were removed from the sablefish assessment, and only the relative population number (RPN) indices were retained. The remaining data were reweighted to compensate for the relative change in weight on other components when the two RPW indices were removed. New data included updated 2009 catch and estimated 2010 catch, 2010 survey relative population numbers (RPN), 2009 fishery RPW, and 2009 ages for surveys and the longline fishery. In general, sablefish catch has dropped since 2004 (following the TACs which reflected a population decline). Normalized abundance indices also reflect this general decline although there are differences between longline survey, trawl survey, and the fishery time series. In particular, the 2010 longline survey shows a substantial increase over 2009; while the fishery index shows a large decline from 2008 to 2009 (data is not yet available for 2010). Details of these trends, as well as regional index trends and trends in whale depredation on the longline surveys, are presented in the assessment. Overall, the biggest increases in 2010 were in the EGOA and to a lesser extent the CGOA areas. In addition, the higher than average number of small age 3 sablefish sized 41-49 cm was a promising sign in the 2010 survey.

The assessment model does not fit the increased population numbers in 2010 very well, but does fit 2009 and the historical Japanese survey well. The model fits age compositions better than last year's model, but there were still some mismatches for 2009 fishery and dominant age classes in the survey. In past years the fishery was disproportionately relying on age 4-9 fish, but in the past two years the fishery catch appears to have moved back towards equilibrium for ages 4-9. The model is not fitting the 2009 fishery RPW data point which was way down from 2008, or the increase in surveys in 2010; it appears to split the difference. The model estimates the 2000 year class to comprise ~25% of spawning biomass, and to be slightly stronger than in past analyses.

At the request of the SSC, initial investigations into differences between gully stations and slope stations in the longline survey and evaluation of the IPHC surveys were completed. Gully stations trend in the same direction as standard stations, except in 2010 when the increase in slope stations was absent in gully stations. This despite the fact that gullies are thought to show trends earlier than the slope areas. The IPHC survey RPNs trends match the sablefish longline survey pretty well, although as expected they are more variable.

Dana described methods for reweighting the indices in detail, and selected the standardized deviation of normalized residuals (SDNR) method as an objective approach. The 2009 model was used for iterative reweighting, and then the variances were fixed based on that and used with updated 2010 information in this year's recommended model (Model 3). The reweighting will not be revisited for several years in the assessment model (but implications of reweighting would be explored in a proposed research version of the model). The reweighting in the recommended model also nearly eliminated a retrospective pattern that had existed in prior models, which was considered an advantage (if an unintended result).

The recommended model projects that 2011 biomass has moved closer to the B40% target, and is now at B37%. Biomass is still predicted to drop in coming years due to low incoming recruitment. The ABC recommendation is a 5% increase for 2010 and a big increase from last year's 2010 projection. The projection for 2012 will be modified by lots more data coming in next year. Apportionment in the EGOA increased; it was up 24% for West Yakutat where fishery and survey indices went up a lot in 2009 and survey in 2010. The WGOA and AI decreased, while the CGOA remained steady in the apportionment. Dana pointed out that these changes arise from changes in the data, not in the model, and that all were in response to requests and reviews.

Dana pointed out that several new hires at the lab may be able to work on new information related to the sablefish assessment. The plan is to develop a research model to explore upcoming issues and leave this

production model as is for assessment. Things to change in short term for the assessment will be data rather than the model: abundance indices and whale depredation specifically. Future steps for the assessment include addressing whale depredation, modeling the fishery index with help from industry to track abundance better, and looking at tagging data to try to get movement estimates, and apportionment methods improved.

The Plan Team discussed whether Model 3 should be used for the assessment. While there were some questions about whether standardized advice was being given to all assessment authors with respect to index reweighting, in general the Plan Teams felt the approach in Model 3 was a good one, and represented an improvement in the assessment. The Plan Teams accepted Model 3 as the assessment model, as well as the author's recommended ABC, OFL, and apportionments for all of Alaska.

As an aside, Jim Ianelli suggested that reweighting could be a proposal for a Stock Assessment Improvement workshop to be held at the national level.

Additional Plan Team and public discussion centered on research questions for sablefish. Brenda Norcross wondered if the recent increase in biomass in the EGOA was from movement alone. Dana responded that further research was necessary to evaluate these trends; it would have been expected that a large increase in biomass would appear first in the CGOA. Mike Sigler asked if the retrospective pattern affected projections, and whether this could explain the continued prediction that we are at a local maximum in biomass but will decrease next year (a phenomenon termed the "Sigler bump" by Dana). Dr. Low asked how upstream and downstream affects of fishing might be addressed in this assessment, similar to how the halibut assessment handles these spatial catch issues. This would be more in the ecosystem context of sablefish fishery management. Tory O'Connell and others asked about collaboration with the fishing industry and the potential for incorporating tagging data and comparing among regions, and investigating the fishery-observed migratory pattern of size from spring versus fall, which may result in different recruitment patterns. An audience member commented that the plot of proportion of age 4-9 in the fishery was helpful and could be used in TAC setting for improved economic performance of the fishery (e.g., backing off to let small fish grow). Another audience member commented that the Chatham Strait sablefish survey is up this year as well, similar to what is seen in full GOA longline survey.

There was some question on how the recent peak in abundance apparently shifts forward each year and the projection indicates that abundance will decrease. It maybe useful to examine whether this pattern of a peak followed by a projected decrease (the "bump") occurs in a formal retrospective analysis.

There was some question on when reweighting is needed. For example, it was unclear why removing a dataset would affect other data-weights if they were already "correct"? The response was that the weights are affected whenever there are inconsistencies between different datasets, and that the previous weights on compositional data were poorly determined.

The Plan Team agrees with the authors' recommended 2011 ABC of 16,040 t (combined BSAI and GOA areas). This represents a 5% increase from the 2010 ABC of 15,230 t. This increase is supported by a substantial increase in the domestic longline survey index that offset the prior year's decrease in the fishery abundance index. There is also a slight increase in estimates of incoming recruitment classes. Spawning biomass is projected to decline through 2013, and then is expected to increase, assuming average recruitment is achieved. Because of the lack of recent strong year classes, the maximum permissible ABC is projected to be 14,697 t in 2012.

The Team has used the same algorithm since December 1999 to apportion the recommended 2011 ABC and OFL, which is based on a 5-year exponential weighting of the survey and fishery abundance indices.

Sablefish recruitment processes

Dana Hanselman presented a document on sablefish recruitment processes which stemmed from the Sablefish EFH update. In the EFH update, it was noted that little was known about juvenile EFH, and that NMFS should consider research closures to try to learn more about effects of intense fishing in a multi-species context. The Council requested a document relating to all factors of sablefish recruitment, so this document reviews early life history and issues with estimating recruitment. Three critical stages were identified: 1) pelagic to nearshore, 2) young of year juveniles settling nearshore, and 3) then moving off to slope habitat. In stage one, eggs hatch at depth and larvae swim to the surface emerging sometimes as far offshore as 200 km. These young-of-the-year grow rapidly and move inshore as pelagics. In stage two, they overwinter and settle in nearshore bays, although it is not known what is special about certain bays. In stage three, 2 year old and older fish move to the shelf break. It is unknown whether there are particular spawning locations. Most data are from summer, and summer habitat is not the same as spawning habitat. It is unknown if there is a type of structure they want for spawning. It is hypothesized that the environment may be most important in stage 1, larval transport. Larvae are transported by currents, and there are persistent GOA offshore eddies that could influence the encounter of preferred habitat. Water column stability and plankton blooms would also affect this stage. In stage 2, competition is more important, and perhaps diet overlap of other predators or euphausiids. In stage 3, predation may be most important. Fishing could directly affect stage 3 by removals, and perhaps habitat degradation. However, there is low discard mortality of juvenile sablefish, so direct fishing effects may not be large. Several research projects are already underway which may address some of these processes, including a NASA funded project, a polar front FATE project, and the GOA-IERP which has sablefish among its 5 key species. The conclusion was that this research could guide next steps, and that we are not yet ready to suggest conservation measures. The authors do suggest that establishing unobtrusive closures in heavily fished areas are one way to learn about fishing effects on benthic habitats and potential affects on multiple fish species.

The EFH Sablefish recruitment update report will be appended to minutes for presentation to Council in December. The Team discussed how effects of fishing on habitat are considered for both sablefish and in the context of broader efforts at marine spatial planning, etc. The Teams commented on the need for small scale research through specific closures to look at effects of benthic habitat on recruitment and production in intensively fished areas. The Plan Team supports making better use of our current closed areas (perhaps by initiating monitoring there) and more coordinated efforts towards assessing the effects of fishing on habitat for multiple species.

Grenadiers

Chris Lunsford presented an update of the full grenadier assessment completed by Dave Clausen and Cara Rodgveller. Grenadiers were not included in recent amendments that in 2011 will eliminate the "other species" category, and move the component groups "in the fishery;" however the Council has initiated trailing ACL amendments that would consider adding grenadiers to the FMP, either in the fishery or under the ecosystem component category. The approved ACL amendments removed reference to nonspecified species (e.g., grenadiers) from the FMPs in 2011. As a result of these management actions, grenadiers will remain outside the FMP. Giant grenadier is the dominant species in the assemblage and is the world's largest-sized grenadier. Reliable biomass estimates are available from trawl surveys and relative biomass estimates from longline surveys. Giant grenadiers are commonly caught in longline fisheries, especially in the sablefish longline fishery, where grenadier catches are similar to the sablefish catches. The assessment authors computed ABC and OFL values using Tier 5 methods. The assessment authors recommend that grenadiers be classified as "in the fishery" because a large amount is presently taken as bycatch, market potential exists, and adequate assessment data is available for OFL and ABC determinations. As an alternative, the authors recommend consideration of moving grenadiers to the "ecosystem component" in the BSAI and "in the fishery" in the GOA.

The Plan Teams strongly recommends that the grenadier be included in the groundfish FMPs to regularly determine their status. The Plan Teams also strongly recommend that grenadiers be classified as "in the fishery" in the GOA. The Plan Teams identified the proposed FMP amendments as a high priority for Council action.

Halibut fishery incidental catch

Olav Ormseth summarized recommendations from the Halibut Incidental Fishery Catch Estimation working group. In December 2009, the SSC requested improvements to estimation methods of discard and continued monitoring of estimated bycatch in the halibut IFQ fishery (until the restructured Observer Program is implemented in 2013). Specifically, the SSC recommended monitoring at-sea discard of rockfish species, skates and sharks. Cindy Tribuzio organized a working group to respond to the SSC request. The group investigated quantitative methods to estimate incidental catches in the unobserved halibut IFQ fishery. The group consulted with the joint Plan Teams in September 2010 on planned approaches and received several recommendations; the SSC did not provide recommendations at its October 2010 meeting but may schedule additional discussion at its February 2011 meeting. The working group has focused on three topics: 1) estimation of variance for extrapolated survey catch and CPUE; 2) data filters of annual survey data to better represent commercial fishing behavior; and 3) ratio estimators to extrapolate survey catch to commercial effort.

In September 2010, the Joint Plan Teams discussed three options for filtering the survey data to more accurately represent commercial behavior: no filter, the top 1/3rd of survey stations (based on halibut CPUE within a strata) and a proportional filter where stations are weighted based on the proportion of commercial effort that occurs in that area . The joint Plan Teams recommended the working group "use the proportional to catch filtering method, which was considered most likely to reflect spatial differences in species composition while sacrificing little survey data compared with the top-third method." (Groundfish Plan Team minutes, September 2010). This proportional method retains more survey stations, broader spatial coverage than the top 1/3rd filter, and may more accurately represent commercial effort.

The Plan Teams endorsed the working group approaches; the Teams recommended that inside waters be filtered out of the estimation and to investigate the potential overlap of catch accounting between the halibut and groundfish fisheries. Catch estimates should be available for stock assessment authors for the next assessment cycle (Fall 2011).

The Teams recommended that for conservation purposes, a consistent approach should be applied for both biomass determination and total catch accounting. Working group members acknowledged that some double counting may occur between the Catch Accounting System and working group estimates, but the overlap is unknown (but believed to be minimal). Diana Stram reported that a similar approach was taken with the scallop assessments (the biomass estimate was increased to account for known discards.

Ecosystem Assessment

Stephani Zador presented the Ecosystem Considerations SAFE for 2011, with emphasis on topics that are new since the September Plan Team meeting. First, the new format was introduced along with the more searchable pdf document structure, which also will be applied to the website when it is updated in December. New Ecosystem Considerations SAFE sections added since September include the Eastern Bering Sea (EBS) Report Card, which summarizes the new synthetic EBS Ecosystem Assessment section. Also new this year is a "Hot Topics" section which highlights endangered species issues in the EBS. The EBS Report Card, Ecosystem Assessment and Hot Topics were assembled by an ecosystem synthesis Team using information from contributions submitted to the SAFE. The idea is to have distillation of information from most detailed to most synthetic: contributions—>assessment—>report card. The plan is to have a regional focus for each assessment and report card; this year the EBS was assessed, and in

subsequent years the other ecosystems will be evaluated. The Team met in September to cull indicators down to a list of the 10 most important to explaining ecosystem-level status and trends in production. They met again in October to analyze the 10 indicators and write a synthetic statement of ecosystem status for the EBS assessment. Another workshop is planned with stock assessment authors to determine appropriate stock-specific ecosystem indicators; this workshop will be scheduled in spring 2011.

Hot Topics overview: there are two sections, endangered species and early warnings.

1. Endangered species (and their potential to impact commercial fisheries activities, i.e., short-tailed albatross (STAL), Steller sea lion(SSL))
    a. **STAL**: bycatch occurred in 2010 on cod longliners along continental shelf break and 1 south of Unimak Pass area; these were first reported takes since 1998. The STAL Recovery Plan allows for a maximum of 4 bycatch mortalities in any 2-yr period; catching a 5th bird initiates Section 7 consultation that could lead other management actions, including possibly fishery closures. The time period for accounting for incidental takes resets in September 2011. The STAL population is increasing (6-7%/yr).
    b. Public comments indicated that the fishing industry looked at a lot of variables between the two takes. There were many differences between the takes (day/night etc.). The vessels with takes were employing the recommended seabird deterrence methods. The affected fishing industry may encourage consultation prior to another bird being caught. They recognize a need to do a better job of deterrence because more birds are out there. It is possible that consultation could result in increased expected take, given the increasing STAL population.
    c. **SSL:** sea lions feeding in EBS are breeding in eastern Aleutian Islands and Bering Sea (so likely dependent on a wider foraging area than previously known)
2. Early Warnings: some common GOA species have recently been observed for the first time in EBS surveys.

Stephani gave an overview of the ten EBS indicators selected by the ecosystem synthesis Team (see the assessment for the full list). She then summarized the findings including November 2010 stock assessment results (see the EBS report card submitted to the December Council meeting for the most up to date figure—this was presented at the PT meeting but was not available in time for the Plan Team review document).

Predictions/Summary of trends and findings for 2011 from EBS Report Card –

- La Nina conditions and above average sea ice predicted for next year
- Euphausiids and copepod recent biomass increase suggests good overall food availability for planktivores, potentially resulting in increased survival of zooplankton feeders
- Mobile epifauna guild is stable, but this masks a decline of commercial crab stocks
- Benthic foragers and fish apex predators guilds are stable
- Pelagic foragers guild is at a historic low, but outlook is improved by the current pollock assessment driving an increasing trend, as well as the increases in zooplankton biomass and the prediction of another above average sea ice year
- Thick-billed murre (TBMU) reproductive success has increased in recent years, along with the increase in zooplankton and consecutive cold years. Continued cold conditions are predicted so projections bode well for TBMU.
- Northern fur seal – long-term population decline; pup production showing no improvement so prediction is for continued population decrease.

The Plan Teams made positive comments about the new EBS report card and ecosystem assessment. The Teams suggested that the authors look at a standardized set of indicators each year; Stephani responded that this is the goal for each ecosystem. The Teams also suggested that the authors note which indicators might be under the control of fishery managers to change and which are not. It was suggested that a salmon index might be included if possible. The Teams asked whether qualitative or quantitative weights can be assigned to indices in an integrated framework. Stephani responded that this year the synthesis Team was given the assignment to pick the most representative indices to reflect system productivity; further refinement of weightings and statistical integration of indicators can happen for future assessments.

Stephani went on to describe the Ecosystem Status and Management Indicators section. Four new contributions and 41 updated contributions are included. Three of the four new contributions were outlined in September. The new contribution for November gives an overview of seabird population trends, hatch dates and reproductive success in the Pribilof Islands. Both islands show either decreasing or stable populations. Hatch dates were earlier for all species where trends were significant, indicating breeding earlier in season (this is thought to be related to prey availability).

Selected Trends and Summaries

Eastern Bering Sea:

- Increase groundfish biomass in BS/AI – pollock comprised largest group
- EBS King and tanner crab -- variable trends
    - red king population declined in last 3 years but within observed range
    - snow crab population gradually increasing
    - tanner crab recent increase in mid-2000s followed by decline in past few years
- Northern fur seals are decreasing at St. Paul (-6%/year); increasing at St George and Bogoslof (+20% at the latter, immigration has to account for part of increase as does summer forage habitat quality). The Teams asked about the adult population; Lowell Fritz (the contribution author) responded that there was no indication that adult numbers are declining, but there is no dataset for adults, so in reality, answer is unknown.
- Summer EBS bottom and sea surface temperatures: below long-term mean; cold pool extent similar to other cold years
- EBS and AI HAPC biota (sea pens/ whips/ anemones/ corals/ sponges): derived from CPUE (relative to largest in time series). Trend analysis difficult due to taxon uncertainty, variable field identification, variable CPUE
- EBS Zooplankton: no trend across domains prior to 1999; decrease from 2000-04/5 (period of relatively warm water); increase after 2004/05. Recent increase in populations of large copepods (thought to be due to cold pool extent); increase in Pseudocalanus since 2006.
- EBS and AI Forage species: sandfish generally low, stichaeids and sand lance higher in recent years (had been low since 1999)
    - Eulachon: little change
    - Capelin: population remains low
    - Arctic cod: higher in cold years (presumed to be due to intrusion from Arctic)
- EBS Jellyfish: CPUE in 2010 similar to 2009 but relatively low between 2000-08
- EBS Poachers, etc.: trends similar within this group. Unknown if noted change due to population change or survey gear selectivity; middle shelf shows increase.

Aleutian Islands:

- AI Water temperatures (Aleutian Islands): warmest in 1997, coolest in 2000; 2010 intermediate
- SST across the Aleutians: warm near Amukta (this is the correct spelling; typo on slide) and region west of Buldir

- AI Rockfish distribution: no definitive trends by position or depth, but increase since 2000 in mean-weighted distribution
- AI HAPC biota: sea pens more likely to be caught in eastern Aleutians
- AI Capelin and pricklebacks dominant in eastern Aleutians; as a general rule, are rarely caught
- AI Miscellaneous species – echinoderms caught often, jellyfish most abundant in 2004 and 2006, many species not sampled well, eelpout numbers high in central and eastern AI since 1991, poacher trends unknown
- AI Fishing and fisheries trends – no alarming or outstanding trends

All three ecosystems:

- Fishing Effort: all at or below long-term average
- Fish stock sustainability index – Ecosystem Report indicates that no commercial fish stocks are overfished or subjected to overfishing. However, blue king crab (in general) and tanner crab (in the southern Bering Sea) are overfished.

[Please see the ecosystem summary section of the GOA Introduction to the SAFE report for recent trends in the GOA ecosystem; this was a survey off-year there so fewer contributions were updated for the GOA.]

The Teams discussed the contributions. A Team member reiterated a comment from September that the fishing effort time series were should be examined more carefully noting that simply basing the effort on observer records may not reflect changes in actual effort. While the editors noted that the gear types had been poorly described in the September figures and that had been corrected, the Team member suggested that the Science Center have input into the effort time series contribution.

Another Team suggestion was that the indicator time series could be treated differently in future chapters: in particular, 'differencing of 1' for standardized plots. This would make the time series stationary so we could see the real trend for analysis. There was a public comment that some trends, in particular for forage fish and poachers may be meaningless because surveys were not designed to catch them. Therefore, he suggested that these indices be dropped. The Teams responded that there is information in these indices and that caveats are listed, so they would prefer to leave them in the chapter and reader can judge whether they are useful for different purposes. In addition, another Team member pointed out that these apparently noisy time series do show correlations with diet trends for well sampled groundfish, so there may be more signal there than is apparent from viewing the indices in isolation.

Sharks

Joint Team Shark Minutes

Jon Heifetz presented both the BSAI and GOA sharks to the joint Plan Teams. In the past sharks have been included in the other species complex but sharks will now be broken out as a separate complex beginning in 2011. The authors continue to recommend managing sharks under Tier 6 (OFL = average catch 1997-2007 and ABC = 0.75OFL) for both the BSAI and GOA. There is a substantial amount of shark catch not accounted for in the halibut fishery, which was presented previously by the non-target working group. The authors do not recommend a biomass based calculation of OFL/ABC (i.e., based on survey biomass estimates) until catches in the halibut fishery are accounted for. The catch accounting system (CAS) is not accounting for shark catch accurately because more sharks are being discarded at-sea than are estimated. The CAS uses observer data for at-sea discard rates and the IFQ halibut fishery is not required to have observer coverage. In addition to the author recommendations, alternative Tier 6 options were presented which included OFL recommendations based on different percentiles of catch history, OFL = maximum catch, and for the GOA two alternatives that would place spiny dogfish in Tier 5 based on GOA bottom survey biomass estimates.

Jon pointed out that the public suggested an alternative approach to the percentile calculations; instead of taking the percentiles by individual species the percentiles could be computed based on the complex as a whole. With this method the catches for individual species are summed before applying the percentile.

The author-recommended OFL and ABC have the potential to constrain fisheries in 2011. This led to discussion of how the unaccounted-for halibut fishery bycatch will be applied when a catch estimate is derived. Tom Pearson commented that the current CAS estimates are based on incidental catch in other groundfish fisheries so he recommended not including not including harvests from the halibut fishery due to lack of estimates. An alternative would be to not deduct estimated halibut fishery catches of sharks from the federal TAC until a new total catch accounting procedure is approved by the SSC and those catches are available.

A member of the public initiated Tier 5 considerations by asking for clarification on the obstacles for moving GOA spiny dogfish to Tier 5. The Team and the author concurred that there appears to be a minimum biomass estimate for the GOA dogfish. Thus, moving dogfish up to Tier 5 is a possibility. Jon pointed out that sleeper shark catches are trending down but it is not known if this is related to abundance.

Another member of the public addressed the percentile approach and requested that the Teams consider using the percentiles for the complex rather than by summing percentiles for individual species. He also stated that the halibut fishery extrapolations in the BSAI are not comparable to the GOA extrapolations because the halibut fishery operates differently in the two regions. His final point was that the percentile approach summed by complex is appropriate because the fishery has big annual spikes in individual species catch. The complex approach is likely to buffer these spikes.

Another member of the public supported the above percentile estimation procedure. This would result in a more conservative BSAI shark OFL of 763 t instead of 1,067 t. This approach would relieve the concern that the OFL could be exceeded 3 out of 10 years. This approach reduces the impacts of outliers. Since sharks are managed as a complex, then calculating the percentiles by the complex is most appropriate.

Mike Sigler felt the 90% approach was acceptable and emphasized he thought the GOA and BSAI Teams should be consistent in making their decisions. Managing each complex is already a more conservative determination that when the complexes were summed under the other species category. The 90% percentile approach for the complex was recommended over the average catch approach.

The Teams agreed that biomass estimates in the GOA are available and should be considered but that in the BSAI the percentile approach based on the complex was preferable. The BSAI Team tentatively decided to go with the Tier 6 90% percentile approach applied to the complex and not individual species. This is different than what was recommended by the assessment authors.

Octopus

Liz Conners provided a summary of the octopus assessments for both areas. The author clarified that the halibut discard mortality rates presented in the assessments were not appropriate to be implemented in regulations, as proposed under the Council's current range of alternatives for revising management of octopus. The teams reviewed assessment results in their separate meetings.

Pacific cod

Grant Thompson presented the BSAI and GOA assessments, both of which used essentially the same three models. The models were chosen in the course of two rounds of trials and reviews by the Teams and the SSC (in May/June and September/October). Model A was the 2009 preferred model, whose main features were:

(i) Natural mortality M = 0.34 fixed externally.

(ii) Length-specific commercial selectivities, estimated in blocks of years, some forced to be asymptotic. Commercial age compositions fitted where available, length compositions where not. Commercial CPUE not fitted.

(iii) Age-specific trawl survey selectivity with annually varying left limb. Trawl survey age composition and CPUE fitted. The product of catchability and selectivity of 60-80 cm fish required to be 0.47 based on a small set of data from archival tag recoveries.

(iv) IPHC longline survey length compositions (not CPUE) fitted.

(v) Cohort-specific growth parameters, with the standard deviation of length at age estimated externally.

(vi) Aging bias of +0.4 years at all ages estimated by profiling and accounted for.

(vii) Input standard deviations of a number of parameters estimated iteratively so as to match output standard deviations.

Model B was the same as Model A with some incremental modifications, viz:

(i) Smaller length bins (1 cm instead of 3 and 5) to make full use of the length data.

(ii) Five fishery seasons were modeled instead of 3.

(iii) A single growth schedule was fitted.

(iv) The few fishery length-at-age data were left out.

(v) IPHC survey length data were left out.

(vi) Parameter values estimated iteratively in the 2009 assessment were carried over to Model B.

Model C was the same as Model B but all age composition and length-at-age data were left out because of concern about aging bias.

Recent survey results affected all model fits. GOA survey abundance increased by 200% in 2009 and EBS survey abundance by 100% in 2010.

Convergence was an issue for almost all models. In fitting the models, first a best estimate was located by perturbing ("jittering") the parameter vector at successive local minima. Reproducibility of the best estimate was then tested by jittering the best estimate and refitting many times. The best estimate was seldom relocated. The CV of the present biomass estimate in these trials was about 3% for Model A in the EBS and 10-20% for Models B and C in the EBS and all models in the GOA.

All model fits to EBS survey abundance were good, and to GOA survey abundance similar. All models fitted the catch length compositions well. Models A and B fitted the age compositions well.

Model A approximated the modes in EBS survey length frequencies reasonably well, but Model B less well. Model C matched the modes very closely but at ages that were high by a year because the fitted growth schedule was permitted to be negative at age one. Grant explained that this could happen because there were no age or size-at-age data whatsoever in the model, so the model could fit the data with length-at-age (and survey selectivity at age) shifted relative to Models A and B. This anomaly could easily be fixed.

All models estimated produced similar estimates of EBS trawl survey selectivity. In the GOA the survey selectivity estimates from Models A and B were extremely variable, to the point of being hardly believable. The estimates for Model C were also quite variable but much less so.

Historical abundance estimates for all models were similar in the EBS. In the GOA Models A and B were similar but Model C estimated very high levels of abundance in the 1970s, which Grant thought were impossible.

Grant adopted a number of criteria for choosing a best model, according to which Model B was better than Model A (better bin and season structure, more parsimonious), and Model C was disqualified because of the anomalous length-at-age in the EBS and the impossible abundance estimates in the GOA. Both Teams agreed with Grant's choice of Model B and his rationale.

Grant previewed upcoming developments in the cod assessment: the option in Stock Synthesis of fitting a Richards growth schedule (with positive lengths at age one) instead of the von Bertalanffy, the possibility of estimating aging error internally, a CIE review in March/April, and possibly an Aleutian Islands assessment. In view of the impending CIE review, the Teams did not attempt at this meeting to formulate any requests for modeling work. But we do want the Teams and the SSC to review the CIE recommendations (and any public submissions) in the May/June period before Grant settles on a program of work for the September/October meetings. We would ask REFM to schedule the CIE review accordingly.

Adjourn

The Joint Plan Team meeting adjourned at approximately 5:30 pm on November 16.

TABLE 7a–PROPOSED 2011 AND 2012 APPORTIONMENT OF PROHIBITED SPECIES CATCH ALLOWANCES TO NON-TRAWL GEAR, THE CDQ PROGRAM, AMENDMENT 80, AND THE BSAI TRAWL LIMITED ACCESS SECTORS

PSC species	Total non-trawl PSC	Non-trawl PSC remaining after CDQ PSQ[1]	Total trawl PSC	Trawl PSC remaining after CDQ PSQ[1]	CDQ PSQ reserve[1]	Amendment 80 sector		BSAI trawl limited access fishery
						2011	2012	
Halibut mortality (mt) BSAI	900	832	3,675	3,349	393	2,375	2,325	875
Herring (mt) BSAI	n/a	n/a	1,974	n/a	n/a	n/a	n/a	n/a
Red king crab (animals) Zone 1[1]	n/a	n/a	197,000	175,921	21,079	93,432	87,925	53,797
C. opilio (animals) COBLZ[2]	n/a	n/a	8,310,480	7,421,259	889,221	3,875,381	3,647,549	2,385,193
C. bairdi crab (animals) Zone 1[2]	n/a	n/a	830,000	741,190	88,810	331,608	312,115	348,285
C. bairdi crab (animals) Zone 2	n/a	n/a	2,520,000	2,250,360	269,640	565,966	532,660	1,053,394

[1] Section 679.21(e)(3)(i)(A)(2) allocates 326 mt of the trawl halibut mortality limit and § 679.21(e)(4)(i)(A) allocates 7.5 percent, or 67 mt, of the non-trawl halibut mortality limit as the PSQ reserve for use by the groundfish CDQ program. The PSQ reserve for crab species is 10.7 percent of each crab PSC limit.

[2] Refer to § 679.2 for definitions of zones.

TABLE 7b-PROPOSED 2011 AND 2012 HERRING AND RED KING CRAB SAVINGS SUBAREA PROHIBITED SPECIES CATCH ALLOWANCES FOR ALL TRAWL SECTORS

Fishery categories	Herring (mt) BSAI	Red king crab (animals) Zone 1
Yellowfin sole	195	n/a
Rock sole/flathead sole/other flatfish [1]	33	n/a
Greenland turbot/arrowtooth/sablefish[2]	16	n/a
Rockfish	12	n/a
Pacific cod	33	n/a
Midwater trawl pollock	1,737	n/a
Pollock/Atka mackerel/other species[3,4]	247	n/a
Red king crab savings subarea non-pelagic trawl gear[5]	n/a	49,250
Total trawl PSC	2,273	197,000

[1]"Other flatfish" for PSC monitoring includes all flatfish species, except for halibut (a prohibited species), arrowtooth flounder, flathead sole, Greenland turbot, Kamchatka flounder, rock sole, and yellowfin sole.

[2]"Arrowtooth flounder" for PSC monitoring includes Kamchatka flounder.

[3]Pollock other than pelagic trawl pollock, Atka mackerel, and "other species" fishery category.

[4]"Other species" for PSC monitoring includes sculpins, sharks, skates, and octopuses.

[5]In October 2009 the Council recommended that the red king crab bycatch limit for non-pelagic trawl fisheries within the RKCSS be limited to 25 percent of the red king crab PSC allowance (see § 679.21(e)(3)(ii)(B)(2)).

TABLE 7c–PROPOSED 2011 AND 2012 PROHIBITED SPECIES BYCATCH ALLOWANCES FOR THE BSAI TRA LIMITED ACCESS SECTOR AND NON-TRAWL FISHERIES

BSAI trawl limited access fisheries	Prohibited species and area[1]				
	Halibut mortality (mt) BSAI	Red king crab (animals) Zone 1	C. opilio (animals) COBLZ	C. bairdi (animals) Zone 1	C. bairdi (animals) Zone 2
Yellowfin sole	167	47,397	2,247,639	293,234	1,005,879
Rock sole/flathead sole/other flatfish[2]	0	0	0	0	0
Turbot/arrowtooth/sablefish[3]	0	0	0	0	0
Rockfish April 15-December 31	5	0	3,821	0	848
Pacific cod	453	6,000	95,523	50,816	42,424
Pollock/Atka mackerel/other species[4]	250	400	38,209	4,235	4,242
Total BSAI trawl limited access PSC	875	53,797	2,385,193	348,285	1,053,394

Non-trawl fisheries	Catcher processor	Catcher vessel
Pacific cod-Total	760	15
January 1-June 10	380	10
June 10-August 15	190	3
August 15-December 31	190	2
Other non-trawl-Total		58
May 1-December 31		58
Groundfish pot and jig		Exempt
Sablefish hook-and-line		Exempt
Total non-trawl PSC		832

[1] Refer to § 679.2 for definitions of areas.

[2] "Other flatfish" for PSC monitoring includes all flatfish species, except for halibut (a prohibited species), arrowtooth flounder, flathead sole, Greenland turbot, Kamchatka flounder, rock sole, and yellowfin sole.

[3] "Arrowtooth flounder" for PSC monitoring includes Kamchatka flounder.

[4] "Other species" for PSC monitoring includes sculpins, sharks, skates, and octopuses.

STATE OF ALASKA

DEPARTMENT OF FISH AND GAME

Division of Commercial Fisheries

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November 17, 2010

Mr. Chris Oliver, Executive Director
North Pacific Fishery Management Council
604 West 4th Avenue, Suite 306
Anchorage, AK 99501-2252

Dear Chris:

This letter provides an estimate of the 2011 spawning biomass of Pacific herring (*Clupea pallasii*) in the eastern Bering Sea for the purposes of establishing bycatch caps per Amendment 16A of the Bering Sea/Aleutians Islands Groundfish FMP. The department's estimate of the 2011 biomass is 250,521 short tons, equivalent to 227,269 metric tons. This estimate is the sum of the spawning location estimates contained in the attached table.

Sincerely,

Doug Woodby
Chief Marine Fisheries Scientist

Table 1. Projections of Pacific herring spawning biomass for spawning aggregations in the eastern Bering Sea, Alaska in 2011.

Spawning area	short tons	metric tons
Norton Sound	42,477	38,534
Cape Romanzof	5,538	5,024
Nunivak Island	3,322	3,014
Nelson Island	5,252	4,765
Cape Avinof	2,393	2,171
Goodnews Bay	36,810	33,393
Security Cove	13,119	11,901
Togiak	140,860	127,786
Port Moller/Port Heiden	750	680
	250,521	227,269

cc: Jane DiCosimo, NPFMC
John Hilsinger, ADF&G