North Pacific Fishery Management Council

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REPORT
of the
SCIENTIFIC AND STATISTICAL COMMITTEE
to the
NORTH PACIFIC FISHERY MANAGEMENT COUNCIL
December 3rd – December 5th, 2012

The SSC met from December 3rd through December 5th at the Hilton Hotel, Anchorage AK.

Members present were:

Pat Livingston, Chair
NOAA Fisheries—AFSC

Robert Clark, Vice Chair
Alaska Department of Fish and Game

Jennifer Burns
University of Alaska Anchorage

Henry Cheng
Wash. Dept. of Fish and Wildlife

Alison Dauble
Oregon Dept. of Fish and Wildlife

Anne Hollowed
NOAA Fisheries—AFSC

George Hunt
University of Washington

Gordon Kruse
University of Alaska Fairbanks

Seth Macinko
University of Rhode Island

Steve Martell
International Pacific Halibut Commission

Franz Mueter
University of Alaska Fairbanks

Jim Murphy
University of Alaska Anchorage

Lew Queirolo
NOAA Fisheries—Alaska Region

Terry Quinn
University of Alaska Fairbanks

Kate Reedy-Maschner
Idaho State University Pocatello

Farron Wallace
NOAA Fisheries—AFSC

Members absent were:

Sherri Dressel
Alaska Department of Fish and Game

Kathy Kuletz
US Fish and Wildlife Service

Miscellaneous issues addressed
A brief presentation was provided to the SSC by Tara Jones and Stephen Grabacki from the Alaska Sea Life Center on their programs, research perspectives, and the Alaska Ocean Leadership Award.

B-1(c) Plan Team nominations

The SSC reviewed the Plan Team nominations of Ian Stewart to the Gulf of Alaska Groundfish Plan Team, and Martin Dorn and William "Buck" Stockhausen to the Crab Plan Team. The SSC finds all three individuals to be well qualified, with appropriate expertise that will assist each of the Plan Teams. The SSC recommends that the Council approve these nominations.

C-1 (a) GOA pollock (salmon excluder) EA and EFP

Diana Stram (NPFMC) presented the draft Environmental Assessment (EA) for issuing an exempted fishing permit (EFP) for testing a salmon excluder device in the Central Gulf of Alaska. John Gauvin

(Gauvin and Associates, LLC) and Katy McGauley (Alaska Groundfish Data Bank) gave an overview of the planned testing and current development stage of a salmon excluder device. Julie Bonney (Alaska Groundfish Data Bank) gave public testimony.

The purpose of the project is to adapt the salmon excluder device developed in the Bering Sea to the Gulf of Alaska pelagic trawl groundfish fishery. This gear engineering work is needed due to the smaller size and horsepower of trawl vessels in the Gulf of Alaska and differences in habitats trawled from those experienced in the Bering Sea where excluder devices have been employed for some time. The experiment would be conducted during the A, B, and D seasons of 2013 and 2014 in the Central Gulf. The proposed experiment is not expected to have any significant negative environmental impacts. The SSC commends the investigators for their efforts to test and develop gear modifications that have the potential to significantly reduce PSC rates in the GOA pollock fishery. The EA appears to be reasonably complete and the application is well-written. **The SSC recommends that the Council approve the EFP application.** The SSC suggests that, to the extent possible, captured Chinook salmon be sampled for genetic tissues and scanned for coded-wire tags to gain additional information on stock-of-origin. As the experiment proceeds, we would anticipate that sample size considerations for precisely estimating the proportions of Chinook salmon and pollock excluded will become clearer. The SSC recognizes that the number of experimental tows may possibly need to be modified to address these considerations.

C-1 (b, c) GOA and BSAI specifications and SAFE report

The SSC received a presentation by Mike Sigler (NMFS-AFSC) on Plan Team recommendations for BSAI groundfish OFL and ABC. Jim Ianelli (NMFS-AFSC) presented the BSAI pollock stock assessment. Gulf of Alaska Plan Team recommendations were summarized by Diana Stram (NPFMC) and Jim Ianelli.

Stock Structure Template

The SSC was asked by the Plan Team to comment on how to proceed with the stock structure template and its implementation in the Council process. The SSC recommended that additional members be added to the stock structure workgroup, comprising members with more management and implementation expertise. The enhanced workgroup would work to provide further enhancements to the template that might provide additional indicators relating to management and implementation issues. In addition, the SSC would look forward to the development of a more detailed proposal by the workgroup of the proposed timeline and process for using the expanded template. This could then be reviewed and discussed by the Plan Teams and SSC.

General SAFE Comments

The SSC reviewed the SAFE chapters and 2011 OFLs with respect to status determinations for BSAI and GOA groundfish. **The SSC accepts the status determination therein, which indicated that, with the exception of BSAI Octopus, no stocks were subject to overfishing in 2011. Also, in reviewing the status of stocks with reliable biomass reference points (all Tier 3 and above stocks and rex sole), the SSC concurs that these stocks are not overfished or approaching an overfished condition.**

The SSC recommends that the authors consider whether it is possible to estimate M with at least two significant digits in all future stock assessments to increase validity of the estimated OFL. The SSC encourages assessment authors of stocks managed in Tier 5 to consider the recommendations found in the draft survey averaging workgroup report.

Table 1. SSC recommendations for Gulf of Alaska groundfish OFLs and ABCs for 2013 and 2014, shown with 2012 OFL, ABC, TAC, and catch amounts in metric tons (2012 catches through November 3rd, 2012 from AKR catch accounting system). None of the SSC recommendations differed from the GOA Plan Team recommendations.

Stock/ Assemblage		2012				2013		2014	
	Area	**OFL**	**ABC**	**TAC**	**Catch**	**OFL**	**ABC**	**OFL**	**ABC**
Pollock	W (61)		30,270	30,270	27,893		28,072		25,648
	C (62)		45,808	45,808	45,050		51,443		47,004
	C (63)		26,348	26,348	25,589		27,372		25,011
	WYAK		3,244	3,244	2,380		3,385		3,093
	Subtotal	143,716	105,670	105,670	100,912	150,817	110,272	138,610	100,756
	EYAK/SEO	14,366	10,774	10,774		14,366	10,774	14,366	10,774
	Total	158,082	116,444	116,444	100,912	165,183	121,046	152,976	111,530
Pacific Cod	W		28,032	21,024	17,703		28,280		29,470
	C		56,940	42,705	34,901		49,288		51,362
	E		2,628	1,971	338		3,232		3,368
	Total	104,000	87,600	65,700	52,942	97,200	80,800	101,100	84,200
Sablefish	W		1,780	1,780	1,390		1,750		1,641
	C		5,760	5,760	5,248		5,540		5,195
	WYAK		2,247	2,247	2,028		2,030		1,902
	SEO		3,176	3,176	3,188		3,190		2,993
	Total	15,330	12,960	12,960	11,854	14,780	12,510	13,871	11,731
Shallow-water flatfish	W		21,994	13,250	153		19,489		18,033
	C		22,910	18,000	3,322		20,168		18,660
	WYAK		4,307	4,307			4,647		4,299
	EYAK/SEO		1,472	1,472			1,180		1,092
	Total	61,681	50,683	37,029	3,475	55,680	45,484	51,580	42,084
Deep-water Flatfish	W		176	176	8		176		176
	C		2,308	2,308	246		2,308		2,308
	WYAK		1,581	1,581	5		1,581		1,581
	EYAK/SEO		1,061	1,061	3		1,061		1,061
	Total	6,834	5,126	5,126	262	6,834	5,126	6,834	5,126
Rex sole	W		1,307	1,307	215		1,300		1,287
	C		6,412	6,412	1,972		6,376		6,310
	WYAK		836	836			832		823
	EYAK/SEO		1,057	1,057			1,052		1,040
	Total	12,561	9,612	9,612	2,187	12,492	9,560	12,362	9,460
Arrowtooth Flounder	W		27,495	14,500	1,331		27,181		26,970
	C		143,162	75,000	18,213		141,527		140,424
	WYAK		21,159	6,900	53		20,917		20,754
	EYAK/SEO		21,066	6,900	140		20,826		20,663
	Total	250,100	212,882	103,300	19,737	247,196	210,451	245,262	208,811
Flathead Sole	W		15,300	8,650	277		15,729		16,063
	C		25,838	15,400	1,613		26,563		27,126
	WYAK		4,558	4,558			4,686		4,785
	EYAK/SEO		1,711	1,711			1,760		1,797
	Total	59,380	47,407	30,319	1,890	61,036	48,738	62,296	49,771

Table 1. continued.

Stock/		2012				2013		2014	
Assemblage	**Area**	**OFL**	**ABC**	**TAC**	**Catch**	**OFL**	**ABC**	**OFL**	**ABC**
Pacific ocean perch	W	2,423	2,102	2,102	2,452		2,040		2,005
	C	12,980	11,263	11,263	10,741		10,926		10,740
	WYAK		1,692	1,692	1,682		1,641		1,613
	W/C/WYAK					16,838		16,555	
	SEO		1,861	1,861		2,081	1,805	2,046	1,775
	Total	19,498	16,918	16,918	14,875	18,919	16,412	18,601	16,133
Northern Rockfish[1]	W		2,156	2,156	1,817		2,008		1,899
	C		3,351	3,351	3,210		3,122		2,951
	E								
	Total	6,574	5,507	5,507	5,027	6,124	5,130	5,791	4,850
Shortraker Rockfish	W		104	104	110		104		104
	C		452	452	361		452		452
	E		525	525	402		525		525
	Total	1,441	1,081	1,081	873	1,441	1,081	1,441	1,081
Dusky rockfish	W		409	409	435		377		354
	C		3,849	3,849	3,558		3,533		3,317
	WYAK		542	542	2		495		465
	EYAK/SEO		318	318	6		295		277
	Total	6,257	5,118	5,118	4,001	5,746	4,700	5,395	4,413
Rougheye and blackspotted rockfish	W		80	80	39		81		83
	C		850	850	389		856		871
	E		293	293	236		295		300
	Total	1,472	1,223	1,223	664	1,482	1,232	1,508	1,254
Demersal rockfish	Total	467	293	293	178	487	303	487	303
Thornyhead Rockfish	W		150	150	186		150		150
	C		766	766	340		766		766
	E		749	749	217		749		749
	Total	2,220	1,665	1,665	743	2,220	1,665	2,220	1,665
Other Rockfish	W		44	44	255		44		44
	C		606	606	724		606		606
	WYAK		230	230	37		230		230
	EYAK/SEO		3,165	200	24		3,165		3,165
	Total	5,305	4,045	1,080	1,040	5,305	4,045	5,305	4,045
Atka mackerel	GOA-wide	6,200	4,700	2,000	1,187	6,200	4,700	6,200	4,700
Big Skate	W		469	469	60		469		469
	C		1,793	1,793	1,596		1,793		1,793
	E		1,505	1,505	38		1505		1,505
	Total	5,023	3,767	3,767	1,694	5,023	3,767	5,023	3,767
Longnose Skate	W		70	70	28		70		70
	C		1,879	1,879	656		1,879		1,879
	E		676	676	78		676		676
	Total	3,500	2,625	2,625	762	3,500	2,625	3,500	2,625
Other Skates	GOA-wide	2,706	2,030	2,030	1,110	2,706	2,030	2,706	2,030
Sculpins	GOA-wide	7,641	5,731	5,731	802	7,614	5,884	7,614	5,884
Sharks	GOA-wide	8,037	6,028	6,028	595	8,037	6,028	8,037	6,028
Squid	GOA-wide	1,530	1,148	1,146	18	1,530	1,148	1,530	1,148
Octopus	GOA-wide	1,941	1,455	1,455	368	1,941	1,455	1,941	1,455
Total	Total	747,780	606,048	438,159	227,196	738,676	595,920	723,580	584,094

[1] Note that for management purposes the ABC for Northern rockfish in the Eastern GOA is combined with Other Rockfish

Table 2. SSC recommendations for BSAI Groundfish OFLs and ABCs for 2013 and 2014 are shown with the 2012 OFL, ABC, TAC, and Catch amounts in metric tons (2012 catches through November 3 from AKR Catch Accounting include CDQ). Recommendations are marked in **bold** where SSC recommendations differ from those of the BSAI Plan Team.

		2012				2013		2014	
Species	**Area**	**OFL**	**ABC**	**TAC**	**Catch**	**OFL**	**ABC**	**OFL**	**ABC**
Pollock	EBS	2,474,000	1,220,000	1,200,000	1,202,560	*2,550,000*	*1,375,000*	*2,730,000*	*1,430,000*
	AI	39,600	32,500	19,000	972	45,600	37,300	48,600	39,800
	Bogoslof	22,000	16,500	500	79	13,400	10,100	13,400	10,100
Pacific cod	BSAI	369,000	314,000	261,000	223,939	359,000	307,000	379,000	323,000
Sablefish	BS	2,640	2,230	2,230	717	1,870	1,580	1,760	1,480
	AI	2,430	2,050	2,050	1,180	2,530	2,140	2,370	2,010
Yellowfin sole	BSAI	222,000	203,000	202,000	137,716	220,000	206,000	219,000	206,000
Greenland turbot	*Total*	11,700	9,660	8,660	4,401	2,540	2,060	3,270	2,650
	EBS	n/a	7,230	6,230	2,744	n/a	1,610	n/a	2,070
	AI	n/a	2,430	2,430	1,657	n/a	450	n/a	580
Arrowtooth flounder	BSAI	181,000	150,000	25,000	22,227	*186,000*	*152,000*	*186,000*	*152,000*
Kamchatka flounder	BSAI	24,800	18,600	17,700	9,558	16,300	12,200	16,300	12,200
Northern rock sole	BSAI	231,000	208,000	87,000	75,806	241,000	214,000	229,000	204,000
Flathead sole	BSAI	84,500	70,400	34,134	11,011	81,500	67,900	80,100	66,700
Alaska plaice	BSAI	64,600	53,400	24,000	16,124	67,000	55,200	60,200	55,800
Other flatfish	BSAI	17,100	12,700	3,200	3,452	17,800	13,300	17,800	13,300
Pacific ocean perch	*Total*	35,000	24,700	24,700	21,837	41,900	35,100	39,500	33,100
	EBS	n/a	5,710	5,710	3,280	n/a	8,130	n/a	7,680
	EAI	n/a	5,620	5,620	5,519	n/a	9,790	n/a	9,240
	CAI	n/a	4,990	4,990	4,800	n/a	6,980	n/a	6,590
	WAI	n/a	8,380	8,380	8,238	n/a	10,200	n/a	9,590
Northern rockfish	BSAI	10,500	8,610	4,700	2,474	12,200	9,850	12,000	9,320
Blackspotted/Rougheye	*Total*	576	475	475	204	**462**	**378**	**524**	**429**
	EBS/EAI	n/a	231	231	74	n/a	**169**	n/a	**189**
	CAI/WAI	n/a	244	244	130	n/a	**209**	n/a	**240**
Shortraker rockfish	BSAI	524	393	393	305	493	370	493	370
Other rockfish	*Total*	1,700	1,280	1,070	924	1,540	1,160	1,540	1,160
	EBS	n/a	710	500	191	n/a	686	n/a	686
	AI	n/a	570	570	733	n/a	473	n/a	473
Atka mackerel	*Total*	96,500	81,400	50,763	47,755	57,700	50,000	56,500	48,900
	EAI/BS	n/a	38,500	38,500	37,237	n/a	16,900	n/a	16,500
	CAI	n/a	22,900	10,763	10,323	n/a	16,000	n/a	15,700
	WAI	n/a	20,000	1,500	195	n/a	17,100	n/a	16,700
Skate	BSAI	39,100	32,600	24,700	22,338	45,800	38,800	44,100	37,300
Sculpin	BSAI	58,300	43,700	5,200	5,469	56,400	42,300	56,400	42,300
Shark	BSAI	1,360	1,020	200	81	1,360	1,020	1,360	1,020
Squid	BSAI	2,620	1,970	425	678	2,620	1,970	2,620	1,970
Octopus	BSAI	3,450	2,590	900	132	3,450	2,590	3,450	2,590
Total	BSAI	3,996,000	2,511,778	2,000,000	1,811,939	4,028,465	2,639,317	4,205,287	2,697,498

Final 2012 OFLs, ABCs, and TACs from 2012-2013 final harvest specifications; total catch updated through November 3, 2012.

Italics indicate where the Team differed from the author's recommendation.

BSAI Pacific cod

Public testimony was provided by Dave Fraser on behalf of Adak Development Corporation. He re-iterated their long-standing support for an area split for Pacific cod, but questioned model assumptions with respect to survey catchability in the Aleutians. Based on his fishing experience there are times (particularly under low-density conditions) when a low-opening net is most efficient, while at other times, a high-opening trawl is more efficient to target off-bottom concentrations. He recommended that the effectiveness of the survey trawl in the Aleutians under different conditions be closely examined.

Following review of the preliminary assessment by the Plan Team in September and SSC in October, four models were selected for this year's final assessment. Model 1 is last year's accepted model, updated with new information (catch data, fishery and survey size compositions, survey abundances, survey age compositions, and fishery CPUE data); Model 2 is identical to model 1 but estimates the survey catchability coefficient as a free parameter; Model 3 is identical to model 1, but does not include age composition data in the likelihood function; Model 4 is an exploratory model that incorporates a number of author-suggested changes.

The authors, as always, have been very responsive to Plan Team and SSC recommendations and the models brought forward in the final assessment were selected based on Plan Team and SSC recommendations. There was insufficient time to consider some other recommended modifications such as time varying survey catchability (SSC, Oct-12) or selectivity parameters estimated by time block, gear, and season (Plan Team, Sep-12). A retrospective analysis was included as requested by the Plan Team and SSC and 'other' removals were included in an appendix but not incorporated in the assessment.

The authors and Plan Team recommend Model 1, which is last year's accepted model. **The SSC concurs with the choice of Model 1 for stock status determinations in 2013** in spite of a good fit for Model 4, which incorporates some desirable features but has not been fully vetted. The data and models suggest a relatively high and increasing biomass in recent years, putting the stock in Tier 3a. The SSC agrees with the current expansion of the biomass estimated for the EBS to the BSAI area based on the updated Kalman filter estimates for biomass distribution between the two areas (93% EBS and 7% AI). In spite of concerns over the status of the stock in the Aleutians as noted below, **the SSC agrees with the Plan Team that there is no compelling reason to reduce the ABC from the maximum permissible value under Tier 3a as summarized below in metric tons. The SSC supports the following ABCs and OFLs for 2013 and 2014 (in metric tons):**

Stock/		2013		2014	
Assemblage	**Area**	**OFL**	**ABC**	**OFL**	**ABC**
Pacific cod	BSAI	359,000	307,000	379,000	323,000

The SSC re-iterates continuing concerns over the best value for the catchability coefficient, which by long-standing practice is either tuned to experimental results or fixed at a previously tuned value to keep it close to the experimental results (currently fixed at 0.77 in Model 1). Based on exploratory models estimating q, catchability may be much higher. The SSC expects to receive a report prior to next year's assessment about a comparison of the standard EBS trawl with a high-opening trawl conducted during the 2012 field season. Very preliminary results suggest that catchability is higher than the currently used value because catch rates in both trawls were not substantially different.

A second concern is the strong retrospective pattern that suggests consistent over-estimation of biomass in the most-recent year, relative to the current assessment. The SSC would like to see a similar analysis of retrospective patterns for a model with an alternative estimate for q (internally estimated or updated value from field experiment) in next year's assessment.

In combination, the above concerns suggest the possibility that biomass may be substantially lower than the current model suggests. However, biomass has increased in recent years in large part to above-average year classes in 2006, 2008, and 2010 and the possibility of another strong year class in 2011 (based on limited 2012 survey data).

The results for Model 4 suggest that several of the new features represent an improvement over the current base model and the SSC recommends bringing forward a similar model next year that retains at least some of these promising features such as the Richards growth curve, newly parameterized seasonal changes in weight-at-length, selectivity modeled as a function of length, and estimating log-scale standard deviations for recruitment internally rather than fixing them. The appropriate treatment of selectivity remains to be determined but the simplifications introduced in Model 4 (i.e. combining gear types), in combination with the other changes, appears to provide a very reasonable fit to the age composition data and other data components.

Aleutian Islands:

The author continued to explore an age-structured model for the Aleutian Islands but did not bring forward a full assessment. Model 1 for the AI is similar to Model 1 for EBS Pacific cod, except that it assumes a single season and fishery per year, does not include age data, and the catchability coefficient is tuned to a higher value (because of the difference in survey net configurations between the two areas, Nichol et al. 2007). Model 2 is similar to Model 1, except that it allows temporal variability in two of the growth parameters. Model 3 is identical to Model 1, except that all input sample sizes for length composition data are multiplied by 1/3 in response to a Plan Team request to use a smaller average sample size. Model 4 differs from Model 1 in that it: 1) excludes US-Japanese joint survey data from before 1990 because of concerns over their reliability, 2) allows survey catchability to vary randomly among surveys, 3) forces selectivity to be asymptotic for the survey but not for the fishery, 4) estimates input sample sizes for length composition data iteratively, 5) allows several selectivity parameters to vary randomly, and 6) estimates the standard deviation for log-recruitment internally.

All models except Model 4 overestimate survey abundances substantially and result in relatively poor fits to the fishery size composition data, particularly in early years when sample sizes were low. All of the models achieved a reasonable fit to the survey size composition data. Recruitment deviations differed considerably for Model 4 and, as the authors noted, the recruitment deviations are very different from those in the eastern Bering Sea and Gulf of Alaska models, while recruitment in the latter two regions is highly synchronous. It is unclear whether that reflects a true difference in recruitment dynamics or suggests a problem with the exploratory AI assessment models.

A number of issues and data gaps were identified by the author that may need to be resolved before the present model can be adopted for stock status determinations for AI Pacific cod. In particular, the authors question whether the data to support an age-structured assessment for AI Pacific cod are adequate given large survey CVs and small sample sizes for length composition data. The SSC encourages further model development but had no specific suggestions beyond those identified in plan team discussions and the possibility of obtaining additional age composition data from archived otoliths.

While these models are still exploratory, the range of models examined appears to provide strong evidence for a substantial decline in biomass in the Aleutian Islands since the early 1990s. This decline, unlike in the Eastern Bering Sea, has continued in recent years and is consistent with observed declines in fishery CPUE in the AI for both longline and trawl fisheries (Fig. 2.3b of the assessment). The model estimates of maxABC ranged from 2,990 to 8,690 for the four exploratory models fit to the AI data and were substantially below the actual catches taken in recent years (29,000 t in 2010, 10,862 t in 2011, and 12,991 t through Nov 3). Therefore the current approach of setting a single ABC for the entire BSAI area raises potentially serious conservation concerns for Pacific cod in the AI. As noted in the SAFE introduction, the SSC has put the Council on notice for some time that it expects to adopt an area-specific ABC and OFL for the Aleutians. Given the heightened conservation concern, the SSC intends to set separate ABC/OFL for EBS Pacific cod and AI Pacific cod for the 2014 fishing season based on the best available information at that time, regardless of whether the age-structured model is adequate for stock status determinations. **Therefore, the Council should initiate preparation of any background supporting documents such as a supplemental NEPA document that may be required for specification of separate ABCs/OFLs in 2014.**

GOA Pacific cod

Public testimony was provided by Julie Bonney (Alaska Groundfish Data Bank) expressing concerns about the significant drop in ABC/OFL due to model changes and about implementing a change in area apportionments prior to adopting the new Kalman filter approach across stocks.

For this assessment cycle the 2011 model (with and without "tail compression") was updated with new data, including catch for 2011, preliminary catch for 2012, catch-at-length for 2011, seasonal and gear-specific catch for 1991-2012, and age composition and mean size-at-age for the 2011 NMFS bottom trawl survey data. In addition, five new models (Models 1-5) were explored to examine the effects of different combinations of the survey '27 cm – plus' and 'sub-27 cm' length groups on model fit. The sub-27 survey data are highly variable and there is considerable uncertainty in the catchability and selectivity of sub-27 cm fish in the trawl survey. In addition, variants of three of the models fixed catchability at 1.04 (2011 value) instead of 1.00.

The SSC agrees with the author's and Plan Team recommendation to use Model 2 for the purposes of specification. This model excludes all of the sub-27cm data, yet estimated a length at age-1 that was more consistent with the observed value than estimates from other models. The biomass estimates were similar to other model configurations. The plan team noted, and the SSC concurs, that Model 4 had much better fits to other data components and encourages the authors to further explore a model that omits or down-weights the mean-length at age data for the 27cm-plus group.

The Pacific cod stock in the Gulf of Alaska has benefitted from relatively strong recruitment from 2005 to 2009, hence stock abundance is expected to be stable or increase in the short term. The projected spawning stock biomass based on Model 2 is 110,000 t in 2013, which is well above the $B_{40\%}$ reference point of 93,900 t and puts the stock in Tier 3a. **The SSC agrees with the Plan Team that there is no reason to reduce the ABC from maximum permissible and the standard control rule results in the OFL and ABC estimates for the total GOA shown in the table below**.

The Plan Team discussed two options for area apportionments using either the established approach or a new Kalman filter approach that has been recommended by a recent working group on the issue. The SSC agrees with using the recommended new approach, resulting in apportionments of 35% in the Western GOA, 61% in the Central GOA, and 4% in the Eastern GOA and the ABC splits shown below (in metric tons):

Stock/		2013		2014	
Assemblage	Area	OFL	ABC	OFL	ABC
Pacific Cod	W		28,280		29,470
	C		49,288		51,362
	E		3,232		3,368
	Total	97,200	80,800	101,100	84,200

With respect to further development of the model, the SSC has the following concerns and recommendations:

- Omitting mean size-at-age data for the 27+ group (Models 3 & 4) had a large effect on biomass estimates (estimating substantially higher biomass levels in the 1980s) and a strong impact on model fits. The Plan Team recommended, and the SSC concurs, to consider down-weighting rather than omitting the mean size-at-age data to more appropriately reflect the effective sample sizes associated with the data. It would also be informative to explore how the exclusion of the size-at-age data in models 3 & 4 interacts with other features of the model to result in these apparently inflated biomass estimates.

- The estimated fishery selectivities-at-length are extremely peaked for most fisheries and the resulting low selectivities for larger size classes imply high abundances of "cryptic" large Pacific cod. While similar patterns are seen in the EBS and Aleutians there is continuing large uncertainty about how to appropriately parameterize selectivity. We encourage the authors to carefully evaluate the impact of the chosen form for selectivity curves on model results and to examine how changes in selectivity interact with the treatment of growth and inclusion of mean size-at-age data.
- Of particular concern is the time varying pattern of dome-shaped selectivity with age in the survey based on very little data prior to the 1990s (Fig. 2.11). It is doubtful that age-based selectivity for the early time period can be reliably estimated if only age data from 1990-2011 was used in the model (as indicated in Table 2.7, where data from 1987 were omitted). It was not clear from the documentation if there were any composition data to inform the first time-block of selectivity for the trawl survey. The SSC encourages the author to develop a model with length-based survey selectivity to take advantage of available length data from all survey years.
- While there are legitimate concerns about the high variability of the sub-27 group, omitting the data may not be consistent with using the best available information. However, using time varying catchability with an index that primarily reflects variability due to incoming year classes is clearly not appropriate.
- To improve fits to the size data, the author may also want to consider using the Richards growth curve to parameterize growth as in Model 4 in the EBS Pcod assessment.

GOA – BSAI Sablefish
This year the authors provided a routine update of the stock assessment model that incorporated relative abundance and length data from the 2012 longline survey, relative abundance and length data from the 2011 longline and trawl fisheries, age data from the 2011 longline survey and 2011 fixed gear fishery, and updated 2011 catch and projected 2012 catch.

Results of the revised stock assessment show that the stock is expected to decline slightly in 2013 and 2014. The 1997 and 2000 year classes are entering into the spawning population.

Projected female spawning biomass for 2013 was 97,193 t, which is 37% of $B_{100\%}$. The stock is slightly below the estimate of $B_{40\%}$ (106,506 t), placing this stock in Tier 3b. The authors' recommended ABC and OFL are set at the maximum permissible levels under the NPFMC harvest strategy. **The SSC agrees that this stock falls in Tier 3b and accepts the Plan Team recommendations for a combined BSAI-GOA ABC and OFL in 2013. The SSC also accepted the author and Plan Teams' projected ABC and OFL for 2014 in the table below (in metric tons).** The GOA and BSAI Plan Teams accepted the author's recommendation for 2013 area apportionments based on a 5-year exponential weighting of the survey and fishery abundance indices. This area apportionment includes the adjustment for the 95:5 hook-and-line:trawl split in the Eastern Gulf of Alaska.

The authors responded to the SSC's request to examine the degree of overlap between the Catch Accounting System (CAS) and Halibut Fishery Incidental Catch Estimate (HFICE). They determined that evaluating this overlap is not possible with the available data. The SSC accepts this conclusion and agrees that, after the Observer Program restructuring is implemented, data may become available that will allow evaluation of this overlap.

The authors reported that fishery CPUE (from observer data) shows a steep drop in 2012, and the average depth fished in the fishery was deeper than previous years. The SSC encourages the authors to investigate whether these changes are due to changes in the fishing behavior (e.g., targeting larger fish) or shifts in the spatial distribution or abundance of the stock. **The SSC supports the following ABCs and OFLs for 2013 and 2014 (in metric tons):**

Sablefish GOA

Stock/ Assemblage	Area	2013 OFL	2013 ABC	2014 OFL	2014 ABC
Sablefish	W		1,750		1,641
	C		5,540		5,195
	WYAK		2,030		1,902
	SEO		3,190		2,993
	Total	14,780	12,510	13,871	11,731

Sablefish BSAI

Stock/ Assemblage	Area	2013 OFL	2013 ABC	2014 OFL	2014 ABC
Sablefish	BS	1,870	1,580	1,760	1,480
	AI	2,530	2,140	2,370	2,010
	Total	4,400	3,720	4,130	3,490

As requested, the authors showed retrospective plots based on the Plan Team retrospective working group recommended format. These plots of female spawning stock biomass and relative retrospective change show the model may be slow to respond to changes in biomass. In the upcoming year, the SSC encourages the authors to continue to explore model changes that may address this issue. Specifically, with recent shifts to deeper water to catch larger, more valuable (per pound) fish, a penalized random walk in selectivity may be more appropriate to model changes in selectivity over time.

The authors reported that they are hoping to formalize a process that would encourage the incorporation of new knowledge of recruitment processes and ecosystem influences (e.g., environmental variables and the Gulf of Alaska Project) in the Ecosystem Considerations section of the species specific SAFE chapters. The SSC looks forward to receiving updates on the progress of this effort. In particular, the SSC encourages the authors to develop a capability to project future year-class strength. These projections can be compared against realized recruitment to evaluate the forecast skill of proposed mechanistic linkages between environmental forcing and recruitment. For example, the new paper by Shotwell *et al.* (2012) appears to hold promise as a projection framework for sablefish.

The authors reported on their efforts to update and evaluate tagging data, and to revise the movement model for BSAI/GOA sablefish. The authors plan to submit a manuscript for publication of the updated movement model and tagging results. In response to questions during the November Plan Team meeting, the authors reported that additional collections of biological samples may be required to support a movement model. The SSC continues to encourage the development of a spatial assessment model for research purposes and supports the additional collection and analysis of biological samples needed to support a movement model.

GOA SAFE and Harvest Specifications for 2013/14

GOA Walleye Pollock

This assessment included changes recommended by the July 2012 CIE review. The authors addressed recommendations that would not require major methodological changes: (1) age 1 data added, (2) a change to how initial abundance-at-age is treated in the first year, (3) a change to the survey biomass likelihoods, (4) removal of pre-1984 data, (5) setting up 6 selectivity blocks according to fishery epochs to reduce the number of estimated selectivity parameters, (6) a change in the weightings for fishery age composition data, and (7) a change in the starting year from 1961 to 1964. In addition, new data from 2011 and 2012 were included. The acoustic biomass index went down, while the ADF&G survey went up in 2012.

Three models were brought forward, including the base model (Model BASE) described in the previous paragraph. Model LY is a model with last year's configuration updated with the new data. For contrast, Model BQ estimates bottom trawl catchability with a Bayesian prior. This maximum likelihood estimate turned out to be 0.72, which is lower than the median prior of 0.85.

The SSC concurs with the Plan Team and authors that Model BASE should be used for specifications. Model BASE results were similar to Model LY but the results were more informative (lower variance). Model BQ simply scaled the biomass estimates upward by 30% but did not change the trend in abundance or the magnitude of stock productivity. Model BQ did not fit the data better than Model BASE.

Results from Model BASE were somewhat more optimistic than in the past. Biomass is near $B_{35\%}$ and the probability of dropping below the $B_{20\%}$ threshold is 0 in each of the next five years. Projections of biomass are generally flat, and there are no major retrospective patterns in biomass.

The SSC concurs with the Plan Team and authors that the stock remains in Tier 3b, because biomass is less than $B_{40\%.}$ **For the last decade, ABC has been reduced from the maximum permissible by a constant buffer (see page 72 of the SAFE). The SSC continues to recommend this approach.** After deductions for the Prince William Sound fishery and an expected pollock catch from an experimental fishing permit, ABCs for 2013 and 2014 and the corresponding OFLs are as summarized in the table below. Apportionments to management areas follow a detailed seasonal and regional approach described in Appendix C.

The Southeast Alaska pollock component is recommended to be in Tier 5, with harvest specifications calculated from the 2011 bottom trawl survey and natural mortality, resulting in the values summarized below (in metric tons).

Stock/ Assemblage	Area	2013 OFL	2013 ABC	2014 OFL	2014 ABC
Pollock	W (61)		28,072		25,648
	C (62)		51,443		47,004
	C (63)		27,372		25,011
	WYAK		3,385		3,093
	Subtotal	150,817	110,272	138,610	100,756
	EYAK/SEO	14,366	10,774	14,366	10,774
	Total	165,183	121,046	152,976	111,530

The SSC appreciates the thorough and thoughtful expositions about ecosystem considerations (starting at page 75) and stock structure (Appendix E).

Research recommendations

1. The SSC agrees with the Plan Team to continue to explore temporal variation in fishery selectivity. In particular, the author should explore whether there is a tradeoff between parsimony and introduction of retrospective error when using time blocks versus a penalized random walk for time varying selectivity.
2. The SSC also agrees with the Plan Team that the authors should investigate splitting off one year-olds in the survey, as is done in the Bering Sea. The rationale is that a large pulse of age 1 fish can dominate the likelihood.
3. The authors should explore if there are variations in female relative abundance that may explain variations in spatial distributions by management areas.

GOA Atka Mackerel

This is an off-year for the GOA Atka mackerel assessment and therefore only an executive summary was prepared. **The SSC concurs with the Plan Team and the stock assessment authors that GOA Atka mackerel harvest specifications should remain in Tier 6, with OFL and ABC for both 2013 and 2014 as shown in the table below (in metric tons).**

Stock/ Assemblage	**Area**	**2013 OFL**	**2013 ABC**	**2014 OFL**	**2014 ABC**
Atka mackerel	GOA-wide	6,200	4,700	6,200	4,700

GOA Flatfish

Shallow-water Flatfish Complex

The shallow-water complex includes yellowfin sole, butter sole, starry flounder, English sole, sand sole and Alaskan plaice (all Tier 5 stocks). This complex also includes northern and southern rock sole; an independent assessment for northern and southern rock sole was conducted and listed as a Tier 3a.

There is no change in the assessment methodology for the Tier 5 stocks and biomass estimates are rolled over for the 2011 survey. Catch for this complex continues to be below the ABC values.

There were several changes to this year's assessment model for northern and southern rock sole, and 8 alternative model configurations were presented. Estimated trends in abundance for southern rock sole were relatively insensitive to alternative model configurations. Trends in the early time period of the northern rock sole differed considerably from the southern rock sole. Model 3 was arbitrarily chosen as it presented an intermediate estimate of biomass during the mid-1970's to mid-1980s for the northern rock sole. The SSC recommends that more formal criteria for model selection be developed and used for northern and southern rock sole.

The SSC supports the author and Plan Team recommendations for ABC and OFL in 2013 and 2014 and area apportionments using combined Tier 3 and Tier 5 calculations for this stock complex (see table at end of flatfish section).

Deepwater Flatfish Complex

The deepwater complex is comprised of Dover sole, Greenland turbot, and deepsea sole. There were no changes to the assessment methodology. The assessment authors used the survey abundance estimate from 2011 rather than a survey averaging approach to determine biomass; next year a survey averaging approach will be used. This stock complex is assessed as Tier 5 (Dover sole) and Tier 6 (other species). The Dover sole was a Tier 3a assessment, but was moved to Tier 5 in 2011.

In September 2012, the assessment author presented progress on the development of a new Dover sole model that is planned to be implemented in the coming year. The SSC looks forward to seeing the results of this new model.

The SSC supports the author and Plan Team recommended 2013 and 2014 ABC and OFLs and area apportionments (see table at the end of the flatfish section).

Rex Sole

The Plan Team adopted a Tier 5 approach using a model estimated biomass for rex sole as would be done for Tier 3 stocks. This is an off-year for the rex sole assessment and only an executive summary was presented for this stock. There were no changes to the assessment model.

The SSC supports the author and plan team recommended ABC and OFLs for 2013 and 2014 (see table at the end of the flatfish section).

Arrowtooth Flounder

New data for arrowtooth flounder only includes updated catch for 2011 and estimated 2012 catch. There were no new survey data for arrowtooth flounder. Therefore, the assessment model was not re-run and ABC recommendations are based on parameter estimates from last year's assessment. The single-species projection model was re-run using only new catch data, with no other underlying changes to the model from the previous year. Arrowtooth flounder is a Tier 3a stock.

Recent trends in estimated age 3+ arrowtooth biomass have stabilized since 2006 and the stock is currently estimated to be just over 2 million t. **The SSC supports the Plan Team and author recommended ABC and OFLs and area apportionments for 2013 and 2014 (see table at the end of the flatfish section).**

Flathead Sole

Flathead sole are a Tier 3a stock that is assessed on a biennial basis and this year is an off-year. Catch for the 2012 fishery was 1,890 t, which is less than the ABC for 2012.

The SSC supported the author and Plan Team's OFL and ABC and area apportionment recommendations for 2013 and 2014 (see table below in metric tons).

Stock/		2013		2014	
Assemblage	**Area**	**OFL**	**ABC**	**OFL**	**ABC**
Shallow-Water Flatfish	W		19,489		18,033
	C		20,168		18,660
	WYAK		4,647		4,299
	EYAK/SEO		1,180		1,092
	Total	55,680	45,484	51,580	42,084
Deep-Water Flatfish	W		176		176
	C		2,308		2,308
	WYAK		1,581		1,581
	EYAK/SEO		1,061		1,061
	Total	6,834	5,126	6,834	5,126
Rex sole	W		1,300		1,287
	C		6,376		6,310
	WYAK		832		823
	EYAK/SEO		1,052		1,040
	Total	12,492	9,560	12,362	9,460
Arrowtooth Flounder	W		27,181		26,970
	C		141,527		140,424
	WYAK		20,917		20,754
	EYAK/SEO		20,826		20,663
	Total	247,196	210,451	245,262	208,811
Flathead Sole	W		15,729		16,063
	C		26,563		27,126
	WYAK		4,686		4,785
	EYAK/SEO		1,760		1,797
	Total	61,036	48,738	62,296	49,771

GOA Rockfish

Pacific ocean perch

The author presented an off-year POP executive summary and 2013-2014 projection models. An updated catch for 2011-2012 was included in the projection model. The 2012 catch was estimated by expanding the October 1, 2012 official catch by a factor of 1.05. Julie Bonney (AGDB) gave public testimony in support of the Plan Team recommendation on the new apportionment of W, C and WYAK areas. **The SSC concurs with the Plan Team and the assessment authors' recommendation that it is a Tier 3a stock. The SSC also accepts the Plan Team's recommended apportionment of ABCs among Western, Central, West Yakutat, and SEO areas in 2013-2014 with revised OFLs for the fished (W/C/WYAK) and lightly fished (SEO) areas (see table below in metric tons).**

Stock/ Assemblage	Area	2013 OFL	2013 ABC	2014 OFL	2014 ABC
Pacific Ocean Perch	W		2,040		2,005
	C		10,926		10,740
	WYAK		1,641		1,613
	W/C/WYAK	16,838		16,555	
	SEO	2,081	1,805	2,046	1,775
	Total	18,919	16,412	18,601	16,133

POP are long lived, as are most rockfish species. Once overfished, long lived fish species may take decades to rebuild or recover. In Figure 9A1 in the SAFE, there is an increasing trend of catch from 1995 to 2011, but the survey biomass trend from 1995 to 2011 is level as shown in Figure 9A2. The SSC is concerned with these two trends. The SSC recommends that close attention be paid in the coming years to whether overages are occurring in the ABCs. If these are occurring, this may warrant revisiting the apportionment scheme in coming years because genetic studies of POP indicate there is an isolation by distance.

Northern Rockfish

The authors provided an updated chapter and executive summary. **The SSC concurs with the Plan Team and the authors' recommendation that it is a Tier 3a stock and the estimated OFL and ABC and apportionments to west, central, and east GOA as shown in the below table (in metric tons).**

Stock/ Assemblage	Area	2013 OFL	2013 ABC	2014 OFL	2014 ABC
Northern rockfish	W		2,008		1,899
	C		3,122		2,951
	E				
	Total	6,124	5,130	5,791	4,850

Shortraker

The SSC reviewed the off-year assessment of the shortraker rockfish. **The SSC accepts the author's and Plan Team's recommended 2013 Tier 5 designation, ABC and OFL for GOA shortraker rockfish as well as the area apportionments for this stock complex. The SSC also accepts the author's and Plan Team's projected 2014 ABC and OFL (in metric tons).**

Stock/ Assemblage	Area	2013 OFL	2013 ABC	2014 OFL	2014 ABC
Shortraker	W		104		104
	C		452		452
	E		525		525
	Total	1,441	1,081	1,441	1,081

Other rockfish (Combination of Slope rockfish and Pelagic shelf complex species)
The SSC reviewed the off-year assessment of the other rockfish. **The SSC accepts the author's and Plan Team's recommended 2013 Tier designation (Tier 4 for sharpchin and Tier 5 for all others), ABC and OFL for GOA other rockfish as well as the area apportionments for this stock complex. The SSC also accepts the author's and Plan Team's projected 2014 ABC and OFL (see table below in metric tons).** The authors noted that the ABCs for Other Rockfish in the western and central GOA were substantially exceeded in 2012, and the 2012 catch of harlequin rockfish in the central GOA was 38% larger than the average over recent years. The SSC concurs with the GOA Plan Team recommendation to examine the fishery catch records in more detail to determine which areas, species, and target fisheries are contributing to the higher catch levels.

Assemblage /Stock	Area	2013 OFL	2013 ABC	2014 OFL	2014 ABC
Other Rockfish	W		44		44
	C		606		606
	WYAK		230		230
	EYAK/SEO		3,165		3,165
	Total	5,305	4,045	5,305	4,045

Dusky rockfish
The SSC reviewed the dusky rockfish update and projections provided in this off-year assessment. The authors updated the catch in the projection model. **The SSC accepts the author's and Plan Team's recommended 2013 Tier designation (Tier 3a), ABC and OFL for GOA dusky rockfish, as well as the area apportionments for this stock. The SSC also accepts the author's and Plan Team's projected 2014 ABC and OFL (see table below in metric tons).** The authors noted that if area specific OFLs were in place they would have been exceeded in the western GOA. The SSC encourages the authors to continue to track this in future years.

Assemblage /Stock	Area	2013 OFL	2013 ABC	2014 OFL	2014 ABC
Dusky rockfish	W		377		354
	C		3,533		3,317
	WYAK		495		465
	EYAK/SEO		295		277
	Total	5,746	4,700	5,395	4,413

Rougheye and blackspotted rockfish
The SSC reviewed the rougheye and blackspotted update and projections provided in this off-year assessment. The authors updated the projection model with observed and projected catch of rougheye and blackspotted rockfish. **The SSC accepts the author's and Plan Team's recommended 2013 Tier designation (Tier 3a), ABC and OFL for GOA rougheye and blackspotted rockfish as well as the area apportionments of ABC for this group of stocks. The SSC also accepts the author's and Plan Team's recommended 2014 projected ABC and OFL for this group of stocks (see table below in metric tons).**

Assemblage /Stock	Area	2013 OFL	2013 ABC	2014 OFL	2014 ABC
Rougheye/ Blackspotted Rockfish	W		81		83
	C		856		871
	E		295		300
	Total	1,482	1,232	1,508	1,254

Demersal Shelf Rockfish (DSR)

Demersal shelf rockfish biomass is estimated from a habitat-based stock assessment focused on yelloweye rockfish densities estimated from visual line transects conducted from submersibles. A submersible survey has not been conducted since 2009. New information for the biomass projections are average weights and catches from all management areas. Exploitable biomass for 2013 (14,588 t) increased slightly from 2012 (14,307 t).

As in previous assessments, the SSC agrees with the authors and Plan Team to apply precautionary measures in establishing allowable harvests, including: 1) using the 90% lower confidence bound, and 2) using a harvest rate lower than maximum under Tier 4 by applying F=M=0.02 to survey biomass. The SSC agrees with the resulting OFL and ABC for 2013 and 2014, expressed in metric tons in the table below.

Stock/ Assemblage	Area	2013 OFL	2013 ABC	2014 OFL	2014 ABC
Demersal rockfish	Total	487	303	487	303

Due to problems with availability of the submersible, a pilot ROV survey was conducted in 2012 with the hope that the ROV survey could supplant the submersible surveys for biomass estimation. The submersible was not available for comparison with the pilot ROV survey, hampering a straightforward transition from the submersible to the ROV for surveys. We look forward to a full analysis of the pilot ROV survey data and a revised survey design applicable to this assessment as soon as practical during the next assessment cycle. We also look forward to seeing a report on the age structured model for this stock that has been under development for some time. The SSC requests the authors provide a summary of all sources of yelloweye mortality in the GOA including a rationale for which source of mortality may be included in the assessment. We continue to encourage the investigation into alternative surveys (e.g., IPHC longline survey) in the assessment.

Thornyhead Rockfish

The SSC supports the rollover of last year's Tier 5 calculations for thornyheads in the Gulf of Alaska, using the most recent trawl survey biomass estimate from 2011. The SSC agrees with the Plan Team's recommendation for the Gulf-wide OFL and ABC for 2013 and 2014, and the area apportionments of the ABC for both years, expressed in metric tons in the table below.

Stock/ Assemblage	Area	2013 OFL	2013 ABC	2014 OFL	2014 ABC
Thornyhead Rockfish	W		150		150
	C		766		766
	E		749		749
	Total	2,220	1,665	2,220	1,665

The SSC agrees with the Plan Team recommendation that trawl surveys extend to 500 m in order to more completely cover available thornyhead habitat and that a Kalman filter approach to estimating biomass be used in the next assessment.

Sharks

The SSC reviewed the off-year assessment of the GOA sharks. **The SSC accepts the author's and Plan Team's recommended 2013 Tier designations, ABC and OFL for GOA sharks. The SSC also accepts the author's and Plan Team's recommendations for 2014 ABC and OFL for this complex (see table below in metric tons).**

As in previous years, biological reference points for GOA sharks are calculated as the sum of estimates from a Tier 5-like calculation that has been accepted as an alternative Tier 6 assessment approach used for spiny dogfish and a traditional Tier 6 approach for Pacific sleeper shark, salmon shark, and other/unidentified sharks. The authors indicated that they plan to develop length-based and surplus production models for the 2013 assessment. The SSC supports this development and will review the results at its October 2013 meeting.

Stock/		2013		2014	
Assemblage	Area	OFL	ABC	OFL	ABC
Sharks	GOA-wide	8,037	6,028	8,037	6,028

GOA Skates

The GOA skate complex is managed as three stock groups. Big skates (*Raja binoculata*) and longnose skates (*Raja rhina*) each have separate harvest specifications, with ABCs specified for each GOA regulatory area (western, central, and eastern). There is also an "other skates" complex with GOA-wide harvest specifications. The authors presented an executive summary with updated catch data. The SSC encourages the assessment author to explore ways to estimate natural mortality directly from data or life history characteristics, if possible. **The SSC agrees with the Plan Team and assessment author's recommendation to continue management of GOA skates as Tier 5, with the 2013-2014 OFL and ABCs, shown in the below table in metric tons.**

Stock/		2013		2014	
Assemblage	Area	OFL	ABC	OFL	ABC
Big Skate	W		469		469
	C		1,793		1,793
	E		1,505		1,505
	Total	5,023	3,767	5,023	3,767
Longnose Skate	W		70		70
	C		1,879		1,879
	E		676		676
	Total	3,500	2,625	3,500	2,625
Other skates	GOA-wide	2,706	2,030	2,706	2,030

GOA Sculpins

The author presented an executive summary on GOA sculpins. The status quo approach to estimating average survey biomass was retained, using the four most recent survey years. The full assessment in 2013 will apply the Kalman filter as recommended by the Joint Plan Team in September 2012. The SSC requests that the author present the results of mean average, weighted average, the Kalman filter approach, and other author recommended methods for estimating biomass used in determination of ABC and OFL for comparison in next years' stock assessment.

The SSC concurs with the Plan Team and assessment author's recommendation that GOA sculpins be managed as a Tier 5 stock with M=0.22 to be applied to the stock as an aggregate. Under Tier 5, the estimated OFL and ABC in 203 and 2014 are shown in the table below in metric tons.

Stock/		**2013**		**2014**	
Assemblage	**Area**	**OFL**	**ABC**	**OFL**	**ABC**
Sculpins	GOA-wide	7,614	5,884	7,614	5,884

GOA Squid

This is an off-year for the GOA squid assessment and therefore only an executive summary was prepared. In 2012, squid catch reported to date is the lowest for which data are available (1990-2012). The author updated catch and retention data with complete 2011 and partial 2012 data.

The SSC agrees with the continuation of an alternative Tier 6 approach for this complex, with OFL set equal to the average catch from 1997-2007 and ABC set equal 75% of OFL, as shown in the table below in metric tons.

Stock/		**2013**		**2014**	
Assemblage	**Area**	**OFL**	**ABC**	**OFL**	**ABC**
Squid	GOA-wide	1,530	1,148	1,530	1,148

GOA Octopus

A new methodology was introduced in the Bering Sea in 2011 to estimate octopus biomass based on the consumption of octopus by Pacific cod. The assessment presents the application of this methodology for GOA octopus, in addition to the status quo method, which uses an alternative Tier 6 approach that employs a Tier 5-like calculation of OFL with an average of the three most recent survey biomass estimates. A third approach was presented, another alternative Tier 6 approach that used the maximum historical (1997-2007) catch to set harvest specifications. The authors recommended the alternative Tier 6 approach based on Pacific cod octopus consumption. However, the Plan Team recommended the status quo method that uses the alternative Tier 6 approach that employs a Tier 5-like assessment methodology and the SSC concurs. The SSC noted, as did the Plan Team, that the use of a natural mortality of 0.53 in the assessment was relatively conservative.

The SSC agrees with the GOA Plan Team recommendation and supports the estimate of OFLs and ABCs under Tier 6, as shown in the table below (metric tons).

Stock/		**2013**		**2014**	
Assemblage	**Area**	**OFL**	**ABC**	**OFL**	**ABC**
Octopus	GOA-wide	1,941	1,455	1,941	1,455

BSAI SAFE and Harvest Specifications for 2013/14

AI Assessment Author recommendations: The SSC requests that all assessment authors of AI species evaluate AI survey information to ensure that the same standardized survey time series is used.

EBS Walleye Pollock

Ed Richardson (PCC) provided public testimony. He supported the Plan Team's ABC of 1.375 million t, suggested that having female spawning biomass between 2 to 3 million t usually resulted in acceptable

recruitments, and felt that the decision table in the assessment was not appropriate for a fast-growing species like pollock.
This is a straightforward update of the stock assessment from last year, involving only new data (2011 fishery catch at age and weight at age, and 2012 preliminary catch and catch at age, acoustic trawl survey abundance at age, and bottom trawl survey abundance at age). There were no model changes.

Both the bottom trawl and acoustic trawl surveys showed increases from last year. Age composition data show strong 2006 and 2008 year-classes. This is confirmed by estimates of recruitment, but the 2006 year-class has a lower recruitment estimate (at age 1) than in last year's assessment and the opposite occurs for the 2008 recruitment estimate. Spawning biomass has increased 44% since the recent low point in 2008 and is slightly above B_{MSY}, and projected biomasses in 2013 and 2014 are projected to be about 20% above B_{MSY}.

Items of concern or observations contributing to uncertainty include: (1) about 22% of survey biomass occurred in Russian waters and was subject to their exploitation, (2) one of the largest cold pools on record occurred in 2012 and pollock have tended to avoid the cold pool in the past (but not this year), (3) retrospective patterns that suggest that strong year-classes can be overestimated, (4) the high CV of the 2008 year-class, (5) larger fishing mortalities on older pollock, and (6) a lack of 1 year olds in the acoustic trawl survey.

New in this year’s assessment is a decision table comparing seven alternative harvest options with respect to 12 decision metrics related to biomass, harvest rate, population age-composition, fishing effort, and salmon PSC. Both the Plan Team and SSC encourage further work on this approach, but felt it was premature to use this method for specifications. The authors and Plan Team objectives this year focused on considerations of long-term or short-term averages of biomass, fishing mortality and age diversity as desirable management levels (comparable to targets). The SSC prefers standard status determination criteria such as $B_{35\%}$, $F_{35\%}$, $B_{40\%}$, $F_{40\%}$, and $B_{100\%}$.

The SSC continues to place EBS pollock in Tier 1a, due to the wealth of information and the presence of a credible spawner-recruit curve and pdf for F_{MSY}. This results in the maximum permissible ABC in 2013 of 2.31 million t, which is about 0.4 million t higher than any annual catch on record. The authors, Plan Team, and SSC all agree that a reduction from the maximum permissible ABC is warranted, given the concerns listed above, in the stock assessment document, and the Plan Team summary and minutes. The authors came up with a 2013 ABC of 1.2 million t, based on a decision table entry corresponding to a 50% probability of reaching the long-term average female spawning biomass in 5 years. Because this is a new criterion based on a long-term average that may not be meaningful, the Plan Team and SSC recommend staying with the same criterion as last year: constraining fishing mortality to the most recent 5-year average. This is conservative because biomass has been increasing, which would normally produce an increase in fishing mortality. This results in the following specifications (in metric tons):

Stock/ Assemblage	Area	2013 OFL	2013 ABC	2014 OFL	2014 ABC
Pollock	EBS	2,550,000	1,375,000	2,730,000	1,430,000

<u>Research consideration</u>
The SSC notes that the adjustment from the maximum permissible of almost 0.9 million t is very large and encourages the authors and the Plan Team seek approaches that help inform the desirable reductions based on the amount of uncertainty.

In the longer term, the SSC encourages the authors to consider explicitly including predation in the assessment model to estimate reference points that better reflect the importance of walleye pollock as a key forage species in the eastern Bering Sea. For example, the approach of Moustahfid et al. (2009) or similar approaches previously pursued by the lead author could be used.

Aleutian Islands Walleye Pollock

The Aleutian Islands pollock assessment is a routine update of the stock assessment model used previously. A new bottom trawl survey was performed this year, so that the information for this assessment should be improving. Spawning biomass has steadily increased since its recent low in 1999 and has reached $B_{34\%}$.

The SSC affirms that this stock belongs in Tier 3b. This results in the following specifications (in metric tons):

Stock/ Assemblage	Area	2013 OFL	2013 ABC	2014 OFL	2014 ABC
AI Pollock	AI	45,600	37,300	48,600	39,800

Bogoslof Walleye Pollock

The Bogoslof survey resulted in the lowest estimate of biomass (67,100 t) since the survey started in 1988. The SSC affirms that this stock belongs in Tier 5. Specifications (in metric tons) are calculated from survey biomass and natural mortality M = 0.20, resulting in:

Stock/ Assemblage	Area	2013 OFL	2013 ABC	2014 OFL	2014 ABC
Bogoslof Pollock	Bogoslof	13,400	10,100	13,400	10,100

Research consideration

This stock has not been fished for a long enough time that catch curve analysis could be used to estimate recent natural mortality. This would be a useful check on the assumed value.

BSAI Atka Mackerel

A number of changes to the assessment model were implemented in the current assessment. These include: (1) The authors estimated the recruitment variance, which in the past assessment was fixed at a value of 0.6, (2) The prior penalty of the parameter determining the degree of dome-shape for fishery selectivity was fixed at 0.30, while it was fixed at 0.10 in the past, and (3) The current fishery selectivity-at-age vector used for projection differs slightly (higher selectivity for ages 3-6 and lower selectivity after age 7) from the fishery selectivity pattern estimated with last year's model configuration. The projected 2013 female spawning biomass is 103,034 t, which is lower than $B_{40\%}$=111,385 t. The Plan Team and the stock assessment authors recommended changing the harvesting specification from Tier 3a to Tier 3b. The projected age 3+ biomass at the beginning of 2013 is estimated at 288,936 t, down about 29% from last year's estimate for 2012. The assessment authors assume 64% of the BSAI-wide ABC is likely to be taken under the implemented Steller Sea Lion Reasonable and Prudent Alternatives (SSL RPAs). This percentage was applied to the 2013 maximum permissible ABC, and that amount was assumed to be caught in order to estimate the 2014 ABCs and OFL values. **The SSC agrees with the Plan Team recommendations for ABC and OFLs as well as area apportionments in the table below (in tons).**

Stock/ Assemblage	Area	2013 OFL	2013 ABC	2014 OFL	2014 ABC
Atka Mackerel	EAI/BS		16,900		16,500
	CAI		16,000		15,700
	WAI		17,100		16,700
	Total	57,700	50,000	56,500	48,900

The SSC observes there is a 10-12 year cycle in estimated biomass, but it disappeared in the past 10 years. SSC recommends that the authors:

i) estimate *M* and *q* directly in the model and report the correlation between these two estimates from the variance-covariance matrix of the final model, or
ii) conduct a sensitivity analysis between various input *M*s around 0.20-0.40 and estimated *q*'s.

BSAI Flatfish

<u>Yellowfin Sole</u>
No changes were made to the assessment methodology. Last year, the SSC supported the Plan Team's suggestion of examining simpler or non-parametric alternative growth models. The assessment authors indicated that an alternative growth model designed to smooth the empirical weight at age data should be implemented in next year's assessment. The SSC appreciates these efforts and looks forward to the results of this analysis.

The EBS yellowfin sole stock has been gradually declining for the past 10 years and is currently just below the $B_{40\%}$ level and 1.5 times B_{msy}. **The SSC support the authors' and Team's OFL and ABC recommendations for 2013 and 2014 using Tier 1 (in metric tons).**

Stock/ Assemblage	Area	2013 OFL	2013 ABC	2014 OFL	2014 ABC
Yellowfin sole	BSAI	220,000	206,000	219,000	206,000

<u>Greenland Turbot</u>
The SSC received public testimony by John Gauvin (Alaska Seafood Cooperative) and Chad See (Freezer Longline Coalition) expressing concerns about the significant changes in OFLs and ABCs associated with changes implemented in this year's assessment. Concerns were expressed about the effects of occasional extremely large recruitments on the assessment model and estimation of reference points. The use of mean recruitment, versus median recruitment, was questioned as an appropriate measure for calculating SB_{100} for this stock that appears to have episodic recruitment.

The Greenland turbot stock assessment has undergone many changes in the past year. These included changes in the method for parameterizing sex-specific selectivity curves, changes in the prior distributions for survey catchability, a re-examination of the weight-length relationship, a new method to weight annual fishery length compositions, and changes in the way that recruitments were estimated in the early years of the series. There were also a number of changes in the input data, including dropping pre-2002 slope survey biomass estimates and weighting the haul-by-haul fishery length composition data proportional to catch. The SSC received a progress report on these changes at the October 2012 meeting.

There were marked changes in both stock status and biological reference points since last year's assessment. Estimated female spawning biomass dropped 51% from 2012 owing to major revisions in the stock assessment model. Female spawning biomass is projected to increase from 23,500 t in 2013 to 26,500 t in 2014 as two strong year classes begin to recruit to the spawning stock. Estimated biomass reference points are larger, whereas fishing mortality reference points are lower, than those estimated in last year's assessment. **In addition to changes in the assessment model and data, input errors in the 2009-2011 projection models were discovered that resulted in large underestimates of all biomass reference points.** For instance, last year's projected stock status for 2012 was $B_{88\%}$ whereas this year's estimate of stock status is only $B_{21\%}$. As a result, the stock now falls under Tier 3b instead of Tier 3a.

Four models were considered. Model 1, the reference model fit to new datasets and weight-at-length estimates, was rejected based on unrealistic selectivity curves. The choice between Models 2-4 was more difficult, but the assessment authors and Plan Team considered Model 2 to be the preferred reference model. Model 3 was identical to Model 2, except that recruitment was modeled with an autocorrelation parameter. Model 3 was determined to be the best fitting model, but it was not selected because of the novelty of the autocorrelation approach and the sensitivity of reference points to the assumed autocorrelation parameter. It is notable that the stock would be determined to be in an overfished condition if model 3 was adopted.

The SSC appreciates the significant efforts of the assessment authors to improve this year's assessment of Greenland turbot. The SSC also appreciates the insights by the authors and Plan Team concerning the alternative models.

The SSC agrees with the selection of Model 2 and application of Tier 3b to establish OFLs and ABCs in this year's assessment. The result is a significant reduction in ABC and OFL for this fishery. It was indicated that this reduction would likely prevent the conduct of a directed fishery for Greenland turbot. In response to an SSC question about bycatch of Greenland turbot in the Kamchatka flounder fishery, it was indicated that there are areas of the slope where Kamchatka flounder could be harvested with low Greenland turbot bycatch. Clearly, the bycatch of Greenland turbot will need to be closely monitored.

For next year's assessment, the SSC provides the following recommendations:

1. The SSC requests further exploration of an alternative model structure to try and resolve the extreme 1965 cohort. This may include estimating average recruitment for the initial age-structure and associated deviates, and an average recruitment for subsequent years with average deviates and a shared sigma R value. There is some concern that the estimates of average recruitment (which defines the SB_{100} value) are potentially biased due to confounding between scaling parameters (R_o, q_{shelf}) and selectivity parameters in the survey.
2. Show the parameter correlation between parameters that describe the descending limb of the survey selectivity curve and the catchability coefficient for q_{shelf}. Consider one model alternative in which early years without data are excluded from the model. The SSC noted some similarities with the eastern Bering Sea Tanner crab assessment. The impacts of the foreign catch and the change in the trawl selectivity are very dramatic.
3. Examine the amount of cryptic biomass (i.e., resulting from dome-shaped selectivity) in the survey data. There is a concern that the survey, which samples small fish on the shelf, is more of a noisy recruitment index with large observation errors.
4. Retain Model 3 as an alternative model and undertake additional evaluation of the autocorrelation feature of this model. The authors might consider whether any environmentally driven mechanisms might help justify a selection of this model in future years.

The SSC supports the following ABC and OFL recommendations for 2013 and 2014 (in metric tons):

Stock/ Assemblage	Area	2013 OFL	2013 ABC	2014 OFL	2014 ABC
Greenland turbot	BS		1,610		2,070
	AI		450		580
	Total	2,540	2,060	3,270	2,650

Arrowtooth Flounder

No significant changes were made to assessment methodology, but several input data sets were updated or revised. The most significant change in input data appears to be replacement of Zimmerman's (1997) female size at maturity data with more recent information from Stark (2008). Because size at 50% maturity is larger in the latter study (46 cm) than the earlier study (42.2 cm), estimates of female spawning biomass are significantly lower in this year's assessment compared to last year's assessment. The Plan Team had concerns about switching from one maturity schedule to the other and also had concerns about the statistical method used to estimate maturity parameters in this year's assessment.

The authors and Plan Team both agreed that the stock should be managed under Tier 3a. The Plan Team did not accept this year's assessment model because of the aforementioned issues with the maturity schedule. Thus, the Team recommended rolling over last year's projected ABC and OFL for 2013 for use in this year's specifications for 2013 and 2014. **Because of the concerns about the use of maturity data in this year's assessment, the SSC agrees with the Plan Team's advice to roll over last year's ABC and OFL specifications.**

In next year's assessment, the SSC requests more detailed information to be presented about the sampling for arrowtooth flounder maturity by Zimmerman (1997) and Stark (2008). In particular, the samples used to estimate both maturity curves should be considered with respect to location of sampling and possible environmental and density-dependent effects to the extent possible. For instance, changes in size at maturity might be expected under different thermal histories of the cohorts sampled and under large shifts in arrowtooth flounder density over time. This additional detail may be helpful to decisions about how to best combine results to estimate maturity for the stock assessment.

However, as both Zimmerman (1997) and Stark (2008) estimated size at maturity for arrowtooth flounder from the Gulf of Alaska, the most obvious shortcoming is the lack of maturity estimates for arrowtooth flounder from the eastern Bering Sea. Major differences in size at maturity exist for other species (e.g., Pacific herring, red king crab) between the Gulf of Alaska and eastern Bering Sea. **The SSC requests the Plan Team to include collection and analysis of maturity data of arrowtooth flounder from the eastern Bering Sea as a research priority.**

The SSC supports the following ABC and OFL recommendations for 2013 and 2014 (in metric tons):

Stock/ Assemblage	Area	2013 OFL	2013 ABC	2014 OFL	2014 ABC
Arrowtooth flounder	BSAI	186,000	152,000	186,000	152,000

Kamchatka Flounder

Kamchatka flounder have been managed under Tier 5 using an estimate of natural mortality (M) and 7-year averages of trawl survey biomass from the Bering Sea shelf and slope and Aleutian Islands. A provisional sex-specific length-based assessment model under Tier 3 was reviewed by the Plan Team in

September 2012 and the SSC in October 2012. Given the extensiveness of the advice by both the Plan Team and SSC, a revised model will be considered in next year's assessment cycle.

The current Tier 5 assessment was updated with the latest survey data from the Aleutian Islands and the Bering Sea slope and shelf. Also, natural mortality (M) was re-evaluated using four methods, resulting in a new estimate of 0.13 compared to 0.20 in last year's assessment. Using the same method as last year, biomass was estimated to be 109,000 t. **The SSC supports the author's and Plan Team recommendations OFL and ABC recommendations using Tier 5.** The SSC looks forward to next year's assessment at which time Kamchatka flounder will be reconsidered for Tier 3 status.

The SSC supports the following ABC and OFL recommendations for 2013 and 2014 (in metric tons):

Stock/ Assemblage	Area	2013 OFL	2013 ABC	2014 OFL	2014 ABC
Kamchatka flounder	BSAI	16,300	12,200	16,300	12,200

Northern Rock Sole

Assessment methodology for northern rock sole was unchanged from last year's assessment; only input data were updated. In last year's assessment, alternative models were explored in which survey catchability (q) was set as a function of bottom temperature. Although there was evidence of a relationship, the estimated mean value for q was unrealistically high. The SSC had requested that alternative model formulations be evaluated this year in which q was constrained to realistic values. The assessment authors implemented the SSC's recommendations from last year and considered Model 1 and six alternatives (Model 7 included a relationship between q and temperature). The assessment author noted that results of Model 7 were very close to those of Model 1, but elected to implement Model 1 for purposes of this year's assessment noting that further testing was needed for Model 7.

The Plan Team endorsed the use of Model 1 and management of northern rock sole under Tier 1a, as spawning biomass is estimated to be 264% of B_{msy} in 2013. **The SSC supports the author's and Plan Team's recommendations for this year and looks forward to further evaluation of the potential effect of temperature on survey q in next year's assessment. The SSC recommends standardizing bottom temperature to mean of 0 and standard deviation of 1.0 (d_t), and model survey q as $q_t = \bar{q}$ exp(lambda * d_t), and estimate the correlation coefficient (lambda) internally in the model.**

The SSC supports the following ABC and OFL recommendations for 2013 and 2014 (in metric tons):

Stock/ Assemblage	Area	2013 OFL	2013 ABC	2014 OFL	2014 ABC
Northern rock sole	BSAI	241,000	214,000	229,000	204,000

Flathead Sole

There was no change in the assessment model from last year other than updated input survey and fishery data. **The SSC supports management of the flathead sole fishery under Tier 3a for the current assessment, as recommended by the assessment authors and Plan Team. However, for next year's assessment, the SSC request that the authors prepare an alternative assessment of flathead sole under Tier 1.** The fitted stock-recruit model (Figure 9.29) suggests that Tier 1 status may be appropriate as with yellowfin sole.

The SSC supports the following ABC and OFL recommendations for 2013 and 2014 (in metric tons):

Stock/ Assemblage	**Area**	**2013 OFL**	**2013 ABC**	**2014 OFL**	**2014 ABC**
Flathead sole	BSAI	81,500	67,900	80,100	66,700

<u>Alaska Plaice</u>

There were no changes in the assessment methodology from last year's assessment; only fishery and survey data were updated. **The authors and Plan Team recommend continued management of the Alaska plaice stock under Tier 3a and the SSC agrees with this approach.**

A survey in 2010 found that 38% of the biomass of Alaska plaice resides in the northern Bering Sea. A challenge to this assessment is how to incorporate this information into the assessment. Biomass estimates from the northern Bering Sea survey are not included in the current assessment, because that area has only been surveyed once and there are no current plans to resurvey this northern area. The SSC appreciates this difficulty and cannot offer meaningful advice except to advocate for additional surveys in the northern Bering Sea. The Alaska plaice assessment is also unique in that it incorporates survey information prior to 1982 into the assessment.

The SSC understands that the assessment authors indicated that they will remove the pre-1982 survey data from next year's assessment. The SSC agrees that this is likely to be prudent, given the reported differences in survey catchability for other groundfish species associated with the switch from the 400 eastern to the 83-112 trawl in 1982. **When this is done, the SSC requests retaining a model fit with full data in next year's assessment so that the effect of this change can be evaluated.**

The SSC supports the following ABC and OFL recommendations for 2013 and 2014 (in metric tons):

Stock/ Assemblage	**Area**	**2013 OFL**	**2013 ABC**	**2014 OFL**	**2014 ABC**
Alaska plaice	BSAI	67,000	55,200	60,200	55,800

<u>Other Flatfish</u>

No changes in assessment methodology were implemented from last year's assessment. Survey and fishery data were updated with recent estimates. In recent years, starry flounder and rex sole have accounted for most of the "other flatfish" catch. Exploitation rates for these two species have been low (<5% during 1997 to 2012). The exploitation rates of butter sole have exceeded 14% in some years and catches exceeded survey biomass estimates in 2008. However, the assessment authors made the case that such estimates are an artifact of survey sampling. Other species in this group (Dover sole, Sakhalin sole, and English sole) occur at the edge of their distributions in the eastern Bering Sea. **The SSC recommends monitoring of survey biomass estimates (and confidence intervals) of these other flatfish species into the future.**

The assessment authors and Plan Team recommended continued management of Other Flatfish as Tier 5 based on species-specific estimates of M and biomass estimates. **The SSC supports the authors' and Plan Team's recommendations below (in metric tons) for OFL and ABC.**

Stock/ Assemblage	**Area**	**2013 OFL**	**2013 ABC**	**2014 OFL**	**2014 ABC**
Other flatfish	BSAI	17,800	13,300	17,800	13,300

BSAI Rockfish
The authors made a significant effort to improve the POP, northern and rougheye stock assessment models. They re-estimated the ageing error matrix and conducted a sensitivity analysis on how the age and length plus groups affect the fit to various model components. The SSC notes that a CIE review of rockfish assessments will be conducted at NMFS-AFSC in Juneau, April 9-11, providing for an independent evaluation of rockfish modeling to aid in future development of these models. The SSC looks forward to receiving the report from this review.

<u>Pacific Ocean Perch (POP)</u>
There were a number of changes to input data in this year's assessment including: 1) updated catch time series, 2) 2012 AI survey biomass estimate and length composition, 3) the 2009 and 2011 fishery age compositions and 2010 fishery length composition, and 4) biased fishery ages from 1977-1980 were removed from the model and replaced with fishery lengths. The model now incorporates a revised maturity curve that is fitted to two sets of new maturity data inside the model. The new curve estimates fish reaching maturity at a younger age than previously thought.

A series of models were run to evaluate how the age plus group affects fits to various model components and to derive the appropriate set of age bins. The author evaluated total likelihood and likelihood for the age compositions, and the standard deviation of normalized residuals for the age and length composition data. Based on this analysis, the plus group was increased from 25 to 40 years, which required updating the age-length conversion matrix and the aging error matrix. These changes improved overall model fit to the data although the model estimate of survey biomass still does not match the high 2010 and 2012 survey biomass estimates very well. Results also indicate that the model does not fit the plus age group very well and greatly under-estimates the 2010 and 2012 survey biomass. Further, based upon the MCMC integration, the posterior distribution for *M* shows little overlap with the prior distribution, indicating that the prior distribution may constrain the estimate. The available data indicate that the estimate of M would be higher if a larger CV was used for the prior.

The SSC recommends that the author further investigate this result by conducting a sensitivity study in which (1) the prior distribution is not used, and (2) the mean and variance of the prior are varied. In addition, there should be a section in the methods that describes how the prior distributions were chosen.

The survey biomass estimates in the Aleutian Islands and the Bering Sea slope in 2012 and 2010 were the highest since 1980. Estimated age 3+ biomass for 2013 is up substantially from the 2013 estimate projected a year ago and spawning biomass is projected to be 274,000 t in 2013 and to decline slightly to 258,000 t in 2014.

The projected OFL increased significantly since the last assessment as a result of: 1) the upward trend in survey biomass, 2) change in maturity curve, and 3) change in the plus group age. **The SSC endorses Plan Team and authors' recommendations below (in metric tons) for OFLs and area splits using maximum permissible ABC. Pacific ocean perch qualify for management under Tier 3 and spawning biomass for 2013 (274,000 t) is projected to exceed $B_{40\%}$, thereby placing POP in sub-tier "a" of Tier 3.**

Stock/ Assemblage	**Area**	**2013 OFL**	**2013 ABC**	**2014 OFL**	**2014 ABC**
Pacific ocean perch	EBS		8,130		7,680
	EAI		9,790		9,240
	CAI		6,980		6,590
	WAI		10,200		9,590
BSAI	Total	41,900	35,100	39,500	33,100

The SSC offers the following advice to assessment authors:

- Explore alternative selectivity patterns
- Evaluate alternative selectivity time periods
- Provide model sensitivity to Q and M
- Explore lack of fit to the plus age group
- Fit to the maturity data should be evaluated for potential bias from excess data consisting of 100% and 0% maturity because the logistic model cannot predict 0 and 1.
- Consider use of other parametric and non-parametric estimation of the uncertainties of unknown parameters such as bootstrapping and jackknife. This may result in different variance-covariance matrices although asymptotically the same.

Northern Rockfish

New data in this year's assessment include: 1) updated catch time series, 2) 2012 AI survey biomass estimate and length composition, and 3) 2008, 2009 and 2011 fishery age compositions and 2010 fishery length composition. The maturity curve was also re-estimated based on recent data from the Aleutian Islands. There are also several changes to model structure that include a revised maturity curve fitted to two sets of new maturity data inside the model. The new curve estimates fish to be reaching 50% maturity at a younger age by nearly 4 years.

A model sensitivity analysis was conducted to evaluate how the age and length plus groups affect the fit to various model components. Based on this analysis, the age and length plus groups were expanded to 40 years and 38cm that represent a tradeoff between model parsimony and improved fits to the age composition data. Given changes in bins for size composition data, the age error matrix was recomputed to better account for aging error within the plus group. These changes greatly improved model performance, especially with respect to the age composition data.

Age 3+ biomass has been on an upward trend since 2002 and spawning biomass has been slowly increasing since 1977. **The SSC endorsed the Plan Team and authors' recommendations for setting the maximum permissible ABC and OFL for the Bering Sea/Aleutian Islands combined. This stock qualifies for management under Tier 3. Since female spawning biomass of 84,700 t exceeds $B_{40\%}$, sub-tier "a" is applicable, with maximum permissible $F_{ABC} = F_{40\%}$ and FOFL = $F_{35\%}$.**

The SSC offers the following advice to assessment authors:

- Explore alternative selectivity patterns
- Evaluate alternative selectivity time periods
- Evaluate model sensitivity to Q and M
- Fit to the maturity data should be evaluated for potential bias from excess data consisting of 100% and 0% maturity because the logistic model cannot predict 0 and 1.

The SSC supports the following ABC and OFL recommendations for 2013 and 2014 (in metric tons):

Stock/		2013		2014	
Assemblage	**Area**	**OFL**	**ABC**	**OFL**	**ABC**
Northern rockfish	BSAI	12,200	9,850	12,000	9,320

Shortraker Rockfish

A simple surplus production model was used to model the shortraker rockfish population and the Kalman filter provided a method of statistically estimating the parameter values. The model is updated with the 2012 survey biomass and shortraker rockfish biomass is an estimated 16,400 t, which is a reduction of 1,100 t from the 2010 estimate.

Reliable estimates of biomass and natural mortality exist for shortraker rockfish, qualifying the species for management under Tier 5. **The SSC agrees with the Plan Team and author recommendations setting F_{ABC} at the maximum permissible level under Tier 5, which is 75 percent of *M*. The accepted value of M for this stock is 0.03, resulting in a maxF_{ABC} value of 0.025**. The biomass estimate for 2013 is 16,400 t for shortraker rockfish.

The SSC supports the following ABC and OFL recommendations for 2013 and 2014 (in metric tons):

Stock/ Assemblage	Area	2013 OFL	2013 ABC	2014 OFL	2014 ABC
Shortraker rockfish	BSAI	493	370	493	370

The AI biomass has been slowly decreasing over the entire time period in this assessment. The SSC requests that authors provide discussion on the potential causes for this trend.

Blackspotted and Rougheye Rockfish Complex

This assessment includes rougheye rockfish (*Sebastes aleutianus*) and blackspotted rockfish (*Sebastes melanostictus*). Current information on these two species is not sufficient to support species-specific assessments. Since 2008, an age-structured model has been applied to the Aleutian Islands portion of the population whereas the EBS portion of the population are assessed with Tier 5 methods applied to survey biomass estimates.

Changes in input data in this year's assessment includes: 1) updated catch time series, 2) 2012 AI survey biomass estimate, 3) 2009 and 2011 fishery age compositions and 2010 fishery length composition, and 4) the 2010 survey age composition and 2012 survey length composition. A model sensitivity analysis was conducted to evaluate how the age and length plus groups affect the fit to various model components. Based on the analysis, the authors set the age for the plus group at 45 and recomputed the age error matrix to better account for aging error within the plus group.

The general trend in survey biomass is fit by the model indicating a gradual increase since 1999 to 13,751 t in 2010. Over this period, spawning biomass has increased from 5,382 t to 6,488 t in 2012, and the total biomass has increased from 15,109 t to 27,040 t. The increase in population size was seen in both the 2010 and 2012 assessments and is mostly due to the considerable model estimates of the 1998 and 1999 cohorts, which are increasing in age and size. These strong year classes are observed in both the survey data and in the recent harvest of immature fish, which suggests that increased abundance rather than a temporal shift in fishing selectivity is responsible for the increasing population trend. The estimated total biomass of the 1998-1999 cohorts is larger in the 2012 assessment, and currently comprises 34% of the estimated 2013 total biomass. The increase in ABC for 2012 is based largely on the estimated increase in abundance of the 1998-1999 cohorts.

The Plan Team had considerable discussion on whether it was appropriate to include model estimates of these two year classes. The Plan Team recommended that these year classes should be excluded from computation of $B_{40\%}$ because $B_{40\%}$ is based on spawning biomass for an equilibrium stock and the 1998 and 1999 year classes have not reached the age of 50% maturity. The Team believes that it is inappropriate to include them in the spawning biomass reference point when they are not yet part of the spawning biomass.

The SSC does not support Plan Team recommendations to exclude estimated recruitment of the 1998-2009 time period for calculation of OFLs and ABCs. Including the 1998-2009 recruits results

in recalculation of ABC and OFLs. For the Aleutian Islands, this stock qualifies for management under Tier 3b because the projected female spawning biomass of 6,848 t is less than $B_{40\%,}$ (10,502 t).

The SSC supports the following ABC and OFL recommendations for 2013 and 2014 (in metric tons):

Stock/ Assemblage	Area	2013 OFL	2013 ABC	2014 OFL	2014 ABC
Blackspotted/	EBS/EAI		**169**		**189**
Rougheye	CAI/WAI		**209**		**240**
BSAI	Total	**462**	**378**	**524**	**429**

The SSC offers the following advice to assessment authors:

- Evaluate priors on survey catchability and natural mortality.
- Explore alternative selectivity patterns
- Evaluate alternative selectivity time periods
- Evaluate/compare mean vs. median recruitment and which time period should be used for estimating fishery bench marks and provide rationale
- A t_0=-4.7 may not be realistic and t_0=0 should be evaluated; this may improve the validity of other parameters, e.g., K, M and q, because they are highly correlated.

<u>Other Rockfish Complex</u>
This assessment incorporates updated catch and fishery lengths, biomass estimates from the 2012 AI trawl survey and the 2012 EBS slope survey, as well as CPUE and lengths from the 2012 AI trawl survey. There were no changes in the assessment methodology and stock biomass is similar to the 2010 assessment.

The SSC concurs with the Tier 5 approach recommended by the Plan Team and author of setting F_{ABC} at the maximum allowable under Tier 5 (F_{ABC} = 0.75M) and for setting OFL. Multiplying these rates by the best biomass estimates of shortspine thornyhead and other rockfish species in the "other rockfish" complex yields 2013 and 2014 ABCs of 686 t in the EBS and 473 t in the AI. This assessment uses a three survey weighted average to estimate biomass using similar methodology used in the Gulf of Alaska rockfish assessments. **The SSC agrees with Plan Team and author recommendation that OFL be set for the entire BSAI area.**

The SSC supports the following ABC and OFL recommendations for 2013 and 2014 (in metric tons):

Stock/ Assemblage	Area	2013 OFL	2013 ABC	2014 OFL	2014 ABC
Other rockfish	EBS		686		686
	AI		473		473
	Total	1,540	1,160	1,540	1,160

BSAI Sharks
The SSC reviewed a full assessment of the BSAI sharks. **The SSC accepts the authors' and Plan Team's recommended 2013 Tier designations, ABC and OFL for BSAI sharks. The SSC also accepts the author's and Plan Team's projected 2014 ABC and OFL for this complex. The SSC supports the following ABC and OFL recommendations for 2013 and 2014 (in metric tons):**

Stock/ Assemblage	Area	2013 OFL	2013 ABC	2014 OFL	2014 ABC
Shark	BSAI	1,360	1,020	1,360	1,020

The SSC continues to encourage authors to pursue studies to collect life history information for sharks and to identify methods for estimating abundance of species that are rarely captured in standard surveys. The SSC remains concerned that the LL RPNs for Pacific sleeper shark stock remain low.

The SSC encourages the authors to explore the possibility of advancing Pacific sleeper shark to a Tier 5 status. To accomplish this, the authors need to understand the absence of mature Pacific sleeper sharks in the surveys and fishery observations.

The authors developed a stock structure template for the BSAI shark complex. This assessment reveals the difficulty of evaluating the need for additional spatial or temporal management when data are limited. The complex includes a mix of species with different life history characteristics. For example, while knowledge of key life history parameters for Pacific sleeper sharks is lacking, the authors expect that this species has a long generation time and is slow growing. However, salmon sharks have a much shorter generation time compared to the other sharks in the complex. Little information is available regarding reproductive behavior, seasonality, and critical habitat (i.e., nursery areas) in the GOA or BSAI. There are no known growth differences among regions in the GOA or BSAI, and data are sparse in the BSAI region. No information is available regarding spawning movements although some seasonal or large-scale movement patterns have been elucidated for salmon sharks and spiny dogfish. Genetic studies have not yet evaluated whether genetic stock structure exists within Alaska.

The authors concluded that, because sharks are a non-target species complex with bycatch-only status, there is no obvious conservation need to apportion catch to areas smaller than the FMP level. The SSC agrees with this conclusion. The SSC places a high priority on continued efforts to address the data limitations revealed by the stock structure evaluation including: efforts to address inadequate catch estimation, unreliable biomass estimates, lack of size frequency collections, and a general lack of life history information for Pacific sleeper sharks throughout Alaska and also for dogfish and salmon sharks in the BSAI region.

BSAI Skates

The SSC concurs with the author and the Plan Team that the Alaska skate stock should be managed as a Tier 3a stock and the other skates complex as a Tier 5 stock. The stock assessment model has been substantially modified with updated data and changes to the growth function, selectivity functions, spawner-recruit function, maximum age, and length bins. Four candidate models were evaluated following Plan Team and SSC suggestions at the September/October meetings. T**he SSC agrees with the author and Plan Team that Model 3 is the best model for Alaska skates**. This model uses only the most recent length-at-age data and estimates growth parameters within the model. **The SSC accepts Plan Team recommendations for ABC and OFL (in metric tons):**

Stock/ Assemblage	Area	2013 OFL	2013 ABC	2014 OFL	2014 ABC
Skate	BSAI	45,800	38,800	44,100	37,300

As a research possibility, it might be fruitful to explore other measurement variables for size, e.g., IOW (inter-orbital width), in field data collection. It may be easier to measure and have smaller measurement error, particularly for large skates.

BSAI Sculpins
The author presented a new estimate of OFL and ABC for 2013 and 2014. The assessment incorporated new biomass estimates from the 2011 and 2012 Bering Sea shelf survey, the 2012 Bering Sea slope survey and the 2012 Aleutian Islands survey, in addition to partial 2012 catch and retention data. Catch data from 2003-2012 was updated as a result of changes to the Catch Accounting System. Length compositions from the 2011 and 2012 Bering Sea shelf survey were also added.

The SSC agrees with the BSAI Plan Team recommendations and supports the estimate of OFLs and ABCs for under Tier 5, as shown in the table below (metric tons).

Stock/		2013		2014	
Assemblage	**Area**	**OFL**	**ABC**	**OFL**	**ABC**
Sculpin	BSAI	56,400	42,300	56,400	42,300

BSAI Squid
This assessment included updated catch from 2011 and partial 2012 data, and added 2012 EBS slope survey biomass estimates and AI survey estimates. The author also included additional discussion of patterns in length compositions, and additional data and analyses to improve the understanding of squid biology and interaction with fisheries.

The SSC agrees with the continuation of Tier 6 management for this complex, with OFL set equal to the average catch from 1978-1995 and ABC set equal 75% of OFL, as shown in the table below in metric tons.

Stock/		2013		2014	
Assemblage	**Area**	**OFL**	**ABC**	**OFL**	**ABC**
Squids	BSAI	2,620	1,970	2,620	1,970

BSAI Octopus
The authors recommended setting harvest specifications using a predation-based estimate of octopus mortality from Pacific cod diet data from the 1984-2008 surveys, as was originally developed for the 2011 BSAI octopus assessment. The Plan Team continued to support the use of this approach for the development of 2013-2014 harvest specifications. The current assessment presented an expanded discussion of the methodology and its associated uncertainty. Survey data has also been updated in this assessment, as well as incidental catch rates.

The SSC agrees with the BSAI Plan Team recommendations and supports the estimate of OFLs and ABCs under an alternative Tier 6 approach, as shown in the table below (metric tons).

Stock/		2013		2014	
Assemblage	**Area**	**OFL**	**ABC**	**OFL**	**ABC**
Octopus	BSAI	3,450	2,590	3,450	2,590

The giant Pacific octopus is the most abundant on the Bering Sea shelf survey and commercial catch of at least seven octopus species found in the BSAI. The SSC encourages the exploration of aging techniques for this octopus species, which would help to construct a growth curve. This will help to determine a more reasonable natural mortality, and with the potential for a more reliable population estimate, a Tier 5 assessment could be considered in the future. The SSC notes the difference between the GOA and BSAI octopus stock assessment methodologies and tiers.

Groundfish SAFE Appendices

GOA – BSAI Grenadiers (currently outside the FMP)

Grenadiers are presently considered "nonspecified." Jane DiCosimo (NPFMC) reported that in 2013 the Council will consider amendments to the BSAI and GOA FMPs to change the management designation ("ecosystem species" or "in the fishery") of this species group. The authors developed a grenadier assessment as an appendix to the SAFE to provide updated information that could be used in development of the amendment packages.

This year's update included the following new data available for this assessment: 1) updated catch estimates for 2003-2012: 2) trawl survey results for the eastern Bering Sea (EBS) slope in 2012; 3) a time series of Aleutian Island (AI) biomass and variance estimates using a new estimation method for 1996-2012; 4) NMFS longline survey results for 2011 and 2012; and 5) observer data on giant grenadier length and sex in the commercial fishery for 2011 and 2012.

Given the historical catch and evidence of a potential market for grenadiers in the GOA, the SSC supports the development of an amendment package to consider alternative management of grenadiers. The SSC agrees that if this stock is moved into the fishery, that data is available to manage this stock in Tier 5.

The authors introduced a new method for determining AI biomass and variance estimates. This new method utilizes the ratio of "shallow" biomass estimates from the trawl survey (1-500 m) to "shallow" relative population weights (RPWs) from the AFSC longline survey (1- 500 m) to extrapolate total biomass from longline survey RPWs for 1-1000 m. The SSC cautions that this is an uncertain extrapolation method. The catchability and size selection of longline surveys is known to differ from the trawl survey. This method assumes that the ratio between longline and trawl surveys in shallow water will be the same for the ratio of longline and trawl surveys in deep water. The SSC encourages the authors to verify whether this assumption is valid.

In response to SSC comments, the authors included a Kalman filter model for estimating biomass. The Kalman filter estimates miss the most recent trawl biomass estimate in the GOA resulting in a substantially lower biomass estimate. For future assessments, the SSC encourages continued exploration of the Kalman filter method and we ask the authors to consider the recommendations in the Plan Team survey averaging work group.

GOA – BSAI Forage fish

The SSC would like to commend the author's efforts to expand the GOA forage species report. The SSC feels that this 2012 report is a significant improvement and is supportive of the new approach being taken to incorporate regular updates to the forage species report into the stock assessment cycle.

The authors have been very responsive to SSC comments from December 2011. However, it appears that many of the SSC suggestions have been put off until a future date. The SSC encourages continued effort towards addressing these comments, including the development of forage fish chapters for the EBS and AI SAFEs.

The forage species included in the GOA report have expanded beyond the forage fish group listed in the GOA FMP, and now include Pacific herring, certain juvenile groundfish species, and salmon, shrimps, and squid. The emphasis of the report has been clarified to focus on development of information to describe the distribution, abundance and availability of the forage base. The report now includes information on bycatch and conservation issues. The SSC supports the Plan Team recommendations regarding the GOA forage species report that were put forward in their minutes.

It would be helpful to include a “data gaps and research priorities” section, similar to those in traditional stock assessments. Currently, this information is scattered throughout the report. For forage fish in each region (EBS, AI, GOA), it would be useful to provide a table or graph depicting the importance of forage species in the diets of their major predators, including fish, marine mammals and seabirds. This information would provide a clear picture of the importance of forage species in each of the managed ecosystems, and would be beneficial for fishery management.

Economic SAFE

The SSC recognizes that preparation of the Economic SAFE is undergoing a transition, with new staff assignments. As such, it appears that there is a learning curve at play, and this is reflected in this year’s draft Economic SAFE. For example, the narrative sections would greatly benefit from a careful proof-read, and use of standard nomenclature (e.g., mixed and confused references to “thousand-million” and “billion” units). The SSC will provide specific editorial recommendations to the Economic SAFE authors.

The document’s introductory text mentions that economic measures are to be interpreted as “gross-level impacts”, but does not label tables and figures as such, which is a deficiency, given the Economic SAFE’s typical use as a historical data reference document (i.e., users may use figures and tables without first thoroughly reading the introductory narrative.

The presenters noted that the Plan Teams incorporate summary statements of the “economic effects and trends” associated with the draft groundfish Biological SAFE. This economic trend summary is not presently, but should be, replicated in the introduction to the Economic SAFE. This would assure internal consistency within these separate elements of the respective-area integrated Groundfish SAFE.

The SSC found the inclusion of new graphic presentations mapping performance (catch, price, value) trends and patterns, by groundfish species, gear, sector, product form, etc., to be a nice addition. The presentation of indices in Chapter 5 should have a list of acronyms.

The document would benefit from a more focused narrative that highlights key changes and trends in each fishery, and to the extent practical, provides insights about the potential causes of these changes. In particular, statements that simply identify the presence of certain tables and figures are unnecessary (e.g., the last two paragraphs on page 8 essentially just note that Tables 20 through 22 exist without any discussion or analysis). In addition, although statements that simply reiterate data contained within the tables may be useful in guiding some readers through the report, it would be more beneficial to include analyses that provide insights about the economic behavior and performance of these fisheries , as well as key factors driving these (e.g., policy changes, exogenous economic shocks or trends, etc.).

The ongoing Research Projects and Data Collection efforts of the AFSC that are listed at the end and the economic and social science publications are very informative. However, it would be useful to know when and how the public may expect incorporation of many of these efforts into the Economic SAFE. There is, for example, a well-developed index-based approach for understanding market changes, and it appears that social indicators are being developed to address community dependency, sociocultural attributes, resilience, and trends. These indicators would strengthen understanding of the human environment and how human communities would be expected to respond to fishery- induced change. The SSC looks forward to the future integration of these indicators into the Economic SAFE.

The changes referenced above cannot, in all likelihood, be anticipated in this iteration of the Economic SAFE, but are recommended for future versions. **That notwithstanding, the present draft must undergo a careful proof-read and edit before public release.**

Ecosystem considerations

While the overall structure of this chapter is maturing, the presentation of this section to the SSC was hindered by the absence of the lead author (editor), and the abbreviated presentation on the status of a select group of indicators. In the future, it would be very helpful if the presentation of the Ecosystem Considerations chapter could emphasize the implications that suites of indicator values have on managed fish stocks, rather than on the status of the indicators themselves. **The SSC requests that the Chapter editor present the significant issues that might affect our determinations of harvest specifications or ecosystem status prior to the review of the individual species assessments and the setting of ABCs and ACLs.** There are several reasons for this request. The SSC realizes that one of the most widely respected aspects of our Council process is our effort to assess the individual species in the context of the marine ecosystems in which they exist. The presentation of the necessary synthesis can best be done by an individual who has a deep understanding of the ecosystem-related issues and who has participated in their synthesis. The editor is in a much better position to answer questions posed by the SSC, and to receive feedback on improvements suggested by the SSC than are Plan Team leaders, who are focused on the assessments and the setting of individual species harvest specifications. Finally, there is value in a separation of presentations on the ecosystem considerations and the presentation of the individual species' assessments. The presence of the Ecosystem Considerations chapter editor is especially essential if there is any evidence of an issue that could or should affect the SSC's deliberations on ABCs and ACLs.

Overview of the Ecosystem Considerations chapter

The SSC appreciates the responsiveness of the authors to the 2011 SSC requests for improving the Ecosystem Considerations chapter. The chapter continues to improve in quality of presentation and relevance of the information presented. The reorganization of the presentations, both the "taxonomic order" and the subjects covered within the individual presentations on Ecosystem Status and Management Indicators, have improved the transfer of information. The inclusion of the Implications section is especially useful, though not all individual authors have done so. The start on the new Arctic section was excellent.

Two possible additional structural changes might be considered. For the reader to get the clearest view of the North Pacific as a whole as well as the four management regions under consideration (Gulf of Alaska, Aleutians, eastern Bering Sea, and Arctic), it might be helpful to separate the individual reports in the Ecosystem Status and Management Indicators section by management area. That would help the reader see the big picture for each area and would assist users in finding the indicator reports of greatest relevance to their needs.

A second structural change that would be helpful would be to develop brief, integrated summaries of indices that are otherwise included in several reports. For example, the four reports on climate (Overland, Lauth, Eisner, and Bond) should be integrated. Similarly, the three reports that address flows into the Bering through the Aleutian Passes should be integrated and disparate findings resolved to reduce confusion. Likewise there are three reports on bottom temperatures on the eastern Bering Sea shelf that have some redundancies and call for a synthesis, as is also true for eastern Bering Sea zooplankton. If the individual report writers are unable to collaborate before turning in their report, perhaps the editor can add a brief synthesis after a group of reports on similar subjects to tie them together.

As the various indices become more established with solid time series behind them, effort should be made to test their skill in predicting recruitment, or forecast ecosystem responses.

Where appropriate and possible, it would be useful to include error measures on all tables and graphs so the reader has a means of assessing the significance of the change being discussed (e.g., Fig. 38, Fig. 50, Table 4, Fig. 53, Fig. 54)

In Table 12, page 199, the total under Overfished, Undefined should be 26, not 16.

Arctic Assessment

Overall, this assessment is very well done, although brief. It will be important to develop additional ecosystem indicators: these could include data such as ice cover over the Chukchi and Beaufort seas shelves, George Divoky's information on black guillemots, a measure of subsistence hunter harvest rates and CPUE, and the condition of polar bear and other harvested species.

Relative to the presentation given, the SSC notes that the unusual mortality event (UME) for marine mammals is more extensive than just walrus. Unusual skin lesions and lethargy have been noted in a variety of arctic marine mammals (seals, walrus, polar bears) and is an area of active investigation. In addition, as ice cover is reduced, many different populations of marine mammals will be impacted (e.g. walruses crowding together on shore, changes in whale abundance and distribution, potential impacts on ice seals). These potential impacts are driving petitions to list several species of ice seals.

Eastern Bering Sea

The section on the EBS is strong, but in several areas could be strengthened by integrating different data streams. For example, in the consideration of top-down effects, it may be time to begin modeling the potential impact of great whales on zooplankton and forage fish stocks, including age-0 and age-1 pollock.

In discussing Bering Sea large zooplankton (page 10), there is no mention of *Themisto libellula*. What is the status of this amphipod, and what are implications of changes in its biomass, if any?

If the non-specified catch increase in the Bering Sea (page 14) is primarily due to increased catches of capelin and eulachon, is this the result of an increase in these species? Please tie in these findings with the forage fish CPUE, page 129, also mentioned on page 11 and 191.

If there is a tie between forage fish abundance and mushy halibut syndrome in the Gulf of Alaska, is there any evidence of a connection between the survival of Chinook salmon in the Bering Sea and the distribution and/or abundance of forage fish there (page 54)? What might be the expected lag between a change in forage fish abundance and returns of Chinook to the Yukon River?

On page 55, there is a suggestion to examine selected indices by domain. This seems like a good idea, if feasible. Given the upcoming synthesis of the Bering Sea Project, which will attempt to work at the level of the BEST/BSIERP areas, it might be good to see whether the scale at which they hope to work might be appropriate.

On the middle of page 56, there is a reference to the need for research on the spatio-temporal distribution of Steller sea lions and their prey. It would be good to include the spatio-temporal distribution of sea lion predators as well.

On page 56, middle, would it be possible to use industry CPUE as an index of fishery performance?

On page 111, the graph indicates very low primary production in the summer/fall of 2007. That year produced a particularly weak year-class of pollock. Can any synthesis be pulled together that would help tie together the events and findings for 2007? (see also page 115, 118, 129, 132).

On page 194, the decrease in HAPC catch is discussed. Is it possible that the decrease is because of prior destruction of the HAPC? Relate to the catch of HAPC in the bottom trawl survey.

Aleutian Islands
In the western Aleutians dusky/rougheye rockfish are being caught in unusually high numbers (western ecoregion, hot topic, page 4). How does this relate to recent stock assessments for these fish in this area?

On page 62, where there is a recap of fish stocks in the Aleutians, it would be good to mention the status of Pacific cod. What is the role of cod in sea lion diets? Many years ago, cod may have been a principal prey.

Page 64: Is there a time series of puffin chick survival or growth available? Prey switching without some independent measure of availability or abundance could mean the increase of prey A rather than the decrease of prey B.

Gulf of Alaska
The SSC looks forward to the development and inclusion of a Report Card section for the Gulf of Alaska.

The SSC expressed concern about the AFSC GOA ichthyoplankton survey going from an annual effort to a biennial effort. Long-term (>25 years) continuous ichthyoplankton surveys are extremely rare, and effort should be made to ensure the survey continues at as frequent intervals as possible. The value of these studies of larval fish would be enhanced if there were some analyses of the relationships between larval abundance (and condition) and subsequent recruitment.

On page 152, there is no mention of how well the index of larval abundance does at predicting recruitment. Ongoing evaluations of how predictions are performing over time are critical to continue.

On page 173, is there any idea why there was a jump in the bycatch of seabirds 2011? Are the birds habituating to the streamers, and beginning to ignore them? Or is this due to increase in TAC? Scaling bycatch to hooks set might be useful.

In the Gulf of Alaska, there has apparently been a decline in forage fish and an increase in mushy halibut syndrome. Forage fish are also prey for Chinook salmon. Can any connections among these three factors be identified? It would also be appropriate to examine how changes in the abundance of humpback whales and zooplankton may be impacting forage fish availability or abundance.

C-2 (b) Initial review BSAI chum salmon PSC management measures
Diana Stram (NPFMC), Jim Ianelli (NMFS-AFSC), Alan Haynie (NMFS-AFSC), and Scott Miller (NMFS-AKR) presented details from the initial review draft Environmental Assessment (EA) and Regulatory Impact Review (RIR) concerning analysis of alternatives and assessment of potential impacts of addressing chum salmon bycatch (PSC) in the BSAI groundfish fisheries. Public testimony was provided by Roy Ashenfelter (self), Donna Parker (Arctic Storm), James Mize (Phoenix Processor), John Gruver (United Catcher Boats), Carl Halflinger (Sea State), Ed Richardson (PCC), and Glenn Reed (Pacific Seafood Processors Association).

In June 2011, the SSC reviewed a prior draft for initial review and recommended that it be released for public review. Because of changes to the suite of alternatives, the SSC has been asked to comment on a revised document. The SSC commends the analysts for their efforts in addressing a complex suite of alternatives with limited information about area-of-origin, industry costs, and impacts to subsistence users. The SSC also acknowledges the thoughtful and constructive participation of the industry in this process. Public comments were extremely helpful in assessing this analysis.

The SSC finds itself in a bit of a quandary. On the one hand, this is the third time this package has come before us for “Initial Review.” These three iterations reflect a huge investment in time, resources, and staff expertise. It is clear that this process needs resolution. On the other-hand, this document remains full of extraneous and distracting information, incomplete and conflicting arguments, ambiguous results, and unnecessary complexity. These should be excised, as previously recommended by the SSC.

Fundamentally, the draft analysis before us appears to provide a small number of key preliminary findings that are at the core of this management action. Stripped of all the extraneous details, one may identify the following (granted preliminary) conclusions, which should become the foci of subsequent revisions:

- Chinook salmon PSC and chum salmon PSC are of real, legitimate, and significant concern to U.S. citizens;
- Reductions of Chum salmon PSC in AFA fisheries that result in increases in Chinook PSC in these fisheries are not desirable;
- Chum PSC savings of the size anticipated from the proposed action, do not appear to have the potential to substantially impact Western Alaska chum catches, either subsistence or commercial (based upon the best available stock identification data);
- In combination, actions to reduce chum and Chinook PSC may cause significant foregone pollock; but the amount is difficult to estimate given the potential changes in fleet behavior.
- As we await critical source-of-origin data for Western Alaska salmon stocks, retention of maximum management flexibility in regulation designed to address chum PSC in the AFA fisheries seems to be a least-cost strategy in the face of uncertainty.

These elements speak directly to the Council's Problem Statement, historical policy, and obligations under the Magnuson Act. We suggest that these should inform efforts to revise this document package.

Additionally, the SSC reiterates its long-standing concerns about the lack of pollock industry cost data that are critical to estimating impacts on industry net performance. The RIR does acknowledge that estimates of potentially foregone gross revenues may have no meaningful relationship to the economic performance, viability, or profitability of these commercial fisheries. The document asserts that the reason for this lack of data is that collection is too expensive even in a best case scenario (page 78). This assertion should be deleted from the document. There are a host of reasons why these data do not exist, and to the extent that costs are a factor, these must be weighed against the potential benefits from collecting these data. The term "expensive" is relative and subjective; given the significance of the pollock fishery and the frequency with which Council actions are related to this fishery, the potential benefits from collecting these data are likely to be large.

It is unclear whether the retrospective analysis accounts for possible interactions with the recently implemented hard cap for Chinook PSC. How would increases in Chinook PSC caused by chum management impact the pollock fleet?

Similarly, there are inconsistencies in the document with respect to impacts on subsistence. On page 22 there is a statement that ADF&G managers assert that the low PSC rates for Western Alaska would have no impact on management considerations. On page 67, however, there is a discussion of how management restrictions would affect subsistence. While it is useful to include a discussion of how subsistence might be impacted if management restrictions were implemented, this should be accompanied by a qualitative discussion of the extent to which these impacts are likely to occur.

With respect to community impacts, the analysts have included the best available information to characterize western Alaskan communities in the descriptions of potentially affected salmon fisheries. These descriptions are clearly not comparable to the pollock industry impact analysis, but the SSC agrees that community impacts cannot be assessed beyond speculation because we cannot know to which streams chum would accrue, how the communities would respond, how actions taken to conserve salmon would affect CDQ revenue, or impact other aspects of the communities. Even with data on salmon savings and returns to particular systems, impacts and community responses would be difficult to characterize beyond analyzing qualitative, speculative scenarios.

The SSC was specifically asked by the analysts to comment on the Council's motion regarding additional qualitative analysis on the use of AEQ and the potential for differential impacts within the region. In the absence of genetic information about area-of-origin, the SSC recommends that the analysts consider a qualitative discussion about the range of possible outcomes and provide some sense of the likelihood of occurrence. For example, two ends of the spectrum for the possible distribution of chum stocks would be that the different streams of origin are uniformly mixed vs. the assumption that fish from each system are clustered together. If the former, given that any particular system represents a small percent of the total population, the impacts are likely to be small. If the latter, then the potential impacts may be significant, but with a small probability of occurring.

Although the EA/RIR/IFRA is not without deficiencies, the SSC recommends that the document be released for public review after addressing these comments to the extent practical.

C-2 (c) Initial review Chinook salmon PSC in GOA non-pollock trawl fisheries

The SSC received a presentation of the draft EA/RIR from Diana Evans and Sam Cunningham (NPFMC). Public comment was provided by Julie Bonney (AGDB), John Gauvin (ASC), and Jon Warrenchuk (Oceana).

The draft RIR is excellent, especially at this relatively early stage of action development (i.e., no PA, so no RFAA). While there appear to be several substantive matters that need attention, none represents a substantial barrier to release of this draft for public review. The EA/RIR is well designed, executed, and presented, providing information needed to inform the public of the state of this action. **The SSC recommends that the draft, after attention to the items below, be released for public review.** The key concerns of the SSC, for the information of the authors/analysts, include the following:

Chinook PSC does not occur in isolation from other PSC limits (present and future) governing these non-pollock trawl fisheries in the GOA. This is a critically important insight within the EA/RIR. The interplay between Chinook PSC limits and, for example, the already "binding" Pacific halibut PSC caps in the GOA non-pollock groundfish fisheries should be elevated in prominence in this analysis. This could readily be achieved by explicitly addressing this key interaction earlier in the RIR. The synergistic nature of Chinook PSC limits and constraints associated with other prohibited species catch within these management areas has the potential to substantially alter predicted economic, socioeconomic, and operational outcomes of the proposed action. Additionally, the race for fish in the GOA groundfish fisheries continues to exacerbate "rational" management of these fishery resources, both target groundfish and PSC, and should be addressed, even if only qualitatively.

The document lacks an identification of possible end users of Chinook salmon or a discussion of the groups for whom salmon are potentially being saved, or a substantive discussion characterizing the nature of the impacts these users are likely to face. There are a number of supplemental letters from a range of stakeholders and interested parties indicating that many individuals self-identify as being affected.

We concur with public testimony that at least the acknowledgement of how changes in non-pollock fisheries could affect infrastructure, secondary services, and crews should be included. The document should also include a discussion of the likelihood of latent licenses becoming active in the fisheries, and the potential affects this could have on the efficacy of Chinook PSC measures.

Some criticism was leveled that the analysis does not reflect the future changes in fishing behavior in the fleet in response to PSC management, although no alternative approach could be identified that would resolve this perceived failure. This is an on-going concern with any retrospective analysis, and the SSC recommends that any analysis which uses this approach include clear disclaimers about the assumptions being made, along with a qualitative discussion about how anticipated changes in behavior might affect the quantitative estimates presented.

The statement that "… there is no evidence to indicate that the groundfish fisheries' take of Chinook salmon is causing escapement failures in Alaska rivers" should be revised. While this is technically accurate, it is also somewhat misleading, as it could imply that there is no linkage between PSC and escapement failures. The statement should be revised to make clear that *given the current lack of data* on river of origin, it is impossible to discern whether there are any linkages between GOA Chinook PSC and drainage-specific escapement failures.

We also believe that more emphasis needs to be placed on the description and discussion of Gulf of Alaska, Canadian, and Lower 48 stocks of Chinook salmon and their respective fisheries; and deemphasize the descriptions of western Alaska stocks and fisheries. There is ample genetic and tag recovery evidence that western Alaska stocks spend little to no time in the Gulf of Alaska, and Central Gulf, in particular. There is more recent information on stock status of Lower 48 stocks (Columbia and Sacramento) indicating recent increases in abundance. Similarly, a description of major hatchery programs originating in the Lower 48 and Canada would be valuable in helping the reader understand the potential stocks that could be intercepted in these GOA non-pollock trawl fisheries.

The SSC observes that a suggestion in the EA that "Chinook salmon sampling in the non-pollock fisheries may not continue" is counter-productive and contrary to the Council's objective relative to stock-of-origin science. Some discussion should be devoted to the development of alternative objectives (e.g., simple presence of a stock, rather than relative catch) and sampling designs that might provide valuable genetic and coded-wire tag information that is not aimed at providing quantitative stock of origin proportions in the PSC.

The EA could also benefit from a brief discussion of what a reasonable AEQ natural mortality rate might be for Chinook salmon, as well as some characterization of the relative uncertainty in extrapolating Chinook salmon PSC from basket samples versus those from whole hauls.