North Pacific Fishery Management Council

Eric A. Olson, Chairman
Chris Oliver, Executive Director

Telephone (907) 271-2809

605 W. 4th Avenue, Suite 306
Anchorage, AK 99501-2252

Fax (907) 271-2817

Visit our website: http://www.alaskafisheries.noaa.gov/npfmc

September 27, 2012

DRAFT AGENDA
210th Plenary Session
North Pacific Fishery Management Council
October 3 - 9, 2012
Anchorage Hilton Hotel

The North Pacific Fishery Management Council will meet at the Anchorage Hilton Hotel. Other meetings to be held during the week are:

Committee/Panel	Beginning
Advisory Panel	October 2 – 6, 2012 – Dillingham/Katmai
Scientific and Statistical Committee	October 1 – 4, 2012 – King Salmon/Illiamna
Enforcement Committee	October 2, 2012 - 1 pm – 5 pm – Birch Room
2013 EM Pilot Project Workshop	October 4, 2012 – 5:30 pm – 7:00 pm – AP Room

All meetings are open to the public, except executive sessions of the Council. Other committee and workgroup meetings may be scheduled on short notice during the week, and will be posted at the hotel.

INFORMATION FOR PERSONS WISHING TO PROVIDE PUBLIC COMMENTS

Sign-up sheets are available at the registration table for those wishing to provide public comments on a specific agenda item. Sign-up must be completed **before** public comment begins on that agenda item. Additional names are generally not accepted **after** public comment has begun.

Submission of Written Comments. Written comments and materials to be included in Council meeting notebooks must be received at the Council office by 5:00 pm (Alaska Time) on **TUESDAY September 25, 2012.** Written and oral comments should include a statement of the source and date of information provided as well as a brief description of the background and interests of the person(s) submitting the statement. Comments can be sent by mail, fax or email. **It is the submitter's responsibility to provide an adequate number of copies of comments after the deadline.** Materials provided **during** the meeting for distribution to Council members should be provided to the Council secretary. A minimum of 25 copies is needed to ensure that Council members, the executive director, NOAA General Counsel, appropriate staff, and the official meeting record each receive a copy. If copies are to be made available for the Advisory Panel (28), Scientific and Statistical Committee (18), or the public after the pre-meeting deadline, they must also be provided by the submitter.

Submission of EMAIL Comments: The Council is accepting email comments at one email address: npfmc.comments@noaa.gov

The Comments must identify the submitter by legal name, affiliation, and date, and must also identify the specific agenda item by number (C-1(a) for example), and must be submitted by the comment deadline. Comments received under these conditions, will be sorted, copied, and included in the Council notebooks. PDF attachments will be accepted, as long as the above criteria are met. Comment received after the deadline will not be copied and distributed, but will be treated the same as written late comments. Emails

submitted for the comments must be to the above address, and not to specific Council staff or Council members. Additionally, email comments will only be accepted on items that are on the scheduled agenda. While a return receipt will be issued automatically upon receipt of the electronic comment, as always, submitters may always call the office to confirm.

FOR THOSE WISHING TO TESTIFY BEFORE THE
ADVISORY PANEL

The Advisory Panel has revised its operating guidelines to incorporate a strict time management approach to its meetings. Rules for testimony before the Advisory Panel have been developed which are similar to those used by the Council. Members of the public wishing to testify before the AP **must** sign up on the list for each topic listed on the agenda. Sign-up sheets are provided in a special notebook located at the back of the room. The deadline for registering to testify is when the agenda topic comes before the AP. The time available for individual and group testimony will be based on the number registered and determined by the AP Chairman. **The AP may not take public testimony on items for which they will not be making recommendations to the Council.**

FOR THOSE WISHING TO TESTIFY BEFORE THE
SCIENTIFIC AND STATISTICAL COMMITTEE

The usual practice is for the SSC to call for public comment immediately following the staff presentation on each agenda item. The Committee will discourage testimony that does not directly address the technical issues of concern to the SSC. **Presentations lasting more than five minutes will require prior approval from the Chair.**

Commonly used Acronyms

AI - Aleutian Islands
AFA - American Fisheries Act
BBRKC - Bristol Bay Red King Crab
BiOp - Biological Opinion
BKC - Blue King Crab
BSAI - Bering Sea and Aleutian Islands
BSFRF - Bering Sea Fisheries Research Foundation
BSIERP - Bering Sea Integrated Ecosystem Research Program
AK BOF - Alaska Board of Fisheries
CDQ - Community Development Quota
CIE - Center for Independent Experts
CGOA - Central Gulf of Alaska
CQE - Community Quota Entity
EDR - Economic Data Reporting
EFP - Exempted Fishing Permit
EIS - Environmental Impact Statement
EFH - Essential Fish Habitat
FLL - Freezer longliners
GOA - Gulf of Alaska

GKC - Golden King Crab
GHL - Guideline Harvest Level
HAPC - Habitat Areas of Particular Concern
IBA - Individual Bycatch Accounting
IBQ - Individual Bycatch Quota
ICA - Inter-cooperative Agreements
IFQ - Individual Fishing Quota
IPQ - Individual Processor Quotas
IPA - Incentive Program Agreements
MPA - Marine Protected Area
NOI - Notice of Intent
PSEIS - Programmatic Supplemental Impact Statement
PSC - Prohibited Species Catch
RKC - Red King Crab
ROFR - Right of First Refusal
SAFE - Stock Assessment and Fishery Evaluation
SSL - Steller Sea Lion
TAC - Total Allowable Catch
VMS - Vessel Monitoring System

September 27, 2012

DRAFT AGENDA
210th Plenary Session
North Pacific Fishery Management Council
October 3-9, 2012

A.   CALL MEETING TO ORDER   **Estimated Time**

(a) Swearing in of newly appointed members
(b) Election of Officers
(c) Approval of Agenda
(d) Approval of Minutes

B.   REPORTS   (6 hrs)

B-1   Executive Director's Report
B-2   NMFS Management Report (Including update on the Habitat Blueprint)
B-3   ADF&G Report
B-4   NOAA Enforcement Report
B-5   USCG Report
B-6   USFWS Report
B-7   Protected Species Report (including CBD coral petition and CIE reviews of SSL BiOP)

C.   MAJOR ISSUES/FINAL ACTION ITEMS

C-1   <u>Halibut Fisheries Issues</u>   (16 hrs)
      (a) ADF&G report on final 2011 sport halibut removals.
      (b) Final Action on Halibut Catch Sharing Plan.
      (c) Charter Halibut: Review Methodology for 2013 limits (SSC only).

C-2   <u>Groundfish Specifications</u>   (2 hrs)
      (a) Receive Groundfish Plan Team reports.
      (b) Adopt proposed groundfish catch specifications.

C-3   <u>Observer Program</u>   (4 hrs)
      (a) Receive NMFS report on Observer Deployment Plan.
      (b) Receive OAC Report.
      (c) EM presentation (ALFA project).

C-4   <u>Steller Sea Lion Issues</u>   (4 hrs)
      (a) SSL EIS scoping (Oct 2); report from SSLMC.
      (b) SSC review of SSL EIS analytical approach.

C-5   <u>Vessel Replacement Issues</u>   (6 hrs)
      (a) Discussion paper on Am 80 vessel replacement with AFA vessels.
      (b) Initial review of AFA Vessel Replacement GOA Sideboards.
      (c) Final Action on FLL Vessel Replacement (MLOA adjustment).

C-6 BSAI Crab Management (12 hrs)
 (a) Initial Review of BSAI Crab ROFR.
 (b) Initial Review of BSAI Crab active participation requirements.
 (c) Discussion paper on BSAI Crab Cooperative Provisions for Crew.
 (d) Workgroup report on BSAI Crab Binding Arbitration – GKC.
 (e) Discussion paper on Binding Arbitration Issues (lengthy season, publishing decisions, IPQ Initiation).
 (f) Crab Economic Data Reporting – Review forms and draft regulations.
 (g) Final OFL/ABC specifications for 6 stocks in the BSAI Crab SAFE.
 (h) Revise alternatives for BSAI Tanner crab rebuilding plan.

D. OTHER ISSUES

D-1 Groundfish Issues (6 hrs)
 (a) Feedback on goals and objectives on CGOA trawl PSC tools.
 (b) Expanded discussion paper on VMS Use and Requirements.
 (c) Review the Bering Sea Habitat Conservation Area Boundary.
 (d) Discussion paper on Northern Bering Sea Research.

D-2 Staff Tasking (2 hrs)
Review Committees and tasking.

D-3 Other Business

(T) = tentative

Total Hours: (56 hrs)

Draft Agenda and Schedule   OCTOBER 2012

	SSC King Salmon/Iliamna	AP Dillingham/Katmai	Council Aleutian
Monday Oct 1	8:00 am C-1 Halibut Issues C-6 C (g) OFL/ABC Crab SAFE, (h) Tanner Crab rebuilding 1:00 pm C-6 (a) ROFR, (b) Active Participation		
Tuesday Oct 2 SSL EIS Scoping Meeting – 5:30-7:30 – AP Room	8:00 am C-2 (a, b) Groundfish Specifications 1:00 pm C-3(a) Observer Program C-4(b) SSL EIS Review Plan Team nominations	8:00 am C-1 Halibut Fisheries Issues 1:00 pm C-1 continued	
Wednesday Oct 3	8:00 am C-5(b) AFA Vessel replacement GOA Sideboards 1:00 pm D-1(d) Northern Bering Sea Research	8:00 am C-2 Groundfish Specifications 1:00 pm C-3 Observer Program	8:00 am B report 1:00 pm B reports continued C-1 Halibut Fisheries Issues
Thursday Oct 4 2013 EM Pilot Project Workshop – AP room – 5:30-7:00		8:00 am C-4 Steller Sea Lion issues 1:00 pm C-5 Vessel Replacement Issues	8:00 am C-1 continued 1:00 pm C-1 continued
Friday Oct 5		8:00 am C-6 BSAI Crab Management 1:00 pm D-1 Groundfish Issues	8:00 am C-1 continued C-2 Groundfish Specifications 12:00pm Executive Session (T) 1:00 pm C-3 Observer Program
Saturday Oct 6		Meeting to continue am - 15th Floor - Chart Room if needed 8:00 am D-1 continued 1:00 pm D-2 Staff Tasking	8:00 am C-4 Steller Sea Lion Issues 1:00 pm C-5 Vessel Replacement Issues
Sunday Oct 7			8:00 am C-5 continued C-6 BSAI Crab Mgmt. 1:00 pm C-6 continued
Monday Oct 8			8:00 am C-6 continued 1:00 pm D-1 Groundfish Issues
Tuesday Oct 9			8:00 am D-2 Staff Tasking 1:00 pm continue as necessary

NOTE: The above agenda items may not be taken in the order in which they appear and are subject to change as necessary. All meetings are open to the public with the exception of Council Executive Sessions.

OCTOBER 2012

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1 SSC/Hilton	**2** SSC/AP Enforcement Commitee	**3** SSC/AP/Council	**4** AP/Council	**5** AP/Council	**6** AP/Council
7 Council	**8** Council HOLIDAY	**9** Council	**10**	**11**	**12** Crab Industry Teleconference	**13**
14	**15**	**16**	**17**	**18** SSL Mitigation Committee thru 19 - Juneau	**19** Halibut Charter Implementation Committee Teleconference	**20**
21	**22**	**23** Council member training – thru 25 – DC	**24**	**25**	**26**	**27**
28	**29**	**30**	**31**			

NOVEMBER 2012

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1	**2**	**3**
4	**5**	**6**	**7** SSL Mitigation Committee thru 9 – Juneau	**8**	**9**	**10**
11	**12** HOLIDAY	**13** Groundfish PT thru 16 - AFSC	**14** SSL Mitigation Committee thru 15	**15**	**16**	**17**
18	**19**	**20**	**21**	**22** HOLIDAY	**23**	**24**
25	**26**	**27**	**28** SSL Mitigation Committee thru 29 – Seattle IPHC Interim Mtg thru 29 - Sea	**29**	**30**	

DECEMBER 2012

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1
2	3 SSC - Hilton	4 SSC/AP	5 SSC/AP/Council	6 AP/Council	7 AP/Council	8 AP/Council
9 Council	10 Council	11 Council	12	13	14	15
16	17	18	19	20	21	22
23/30	24/31	25 HOLIDAY	26	27	28	29

JANUARY 2013

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1 HOLIDAY	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21 HOLIDAY AK Marine Science Symposium thru 25 – Captain Cook	22 IPHC Annual Mtg – thru 25, Victoria, BC	23	24	25	26
27	28	29	30	31		

FEBRUARY 2013

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1	2
3	4 SSC – Portland	5 SSC/AP	6 SSC/AP/Council	7 AP/Council	8 AP/Council	9 AP/Council
10 Council	11 Council	12 Council	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28		

MARCH 2013

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24/31	25	26	27	28	29	30

APRIL 2013

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1 SSC - Hilton	2 SSC/AP	3 SSC/AP/Council	4 AP/Council	5 AP/Council	6 AP/Council
7 Council	8 Council	9 Council	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

MAY 2013

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1	2	3	4
5	6 CCC meeting – 6-10-11 - DC	7 Managing our Nation's Fisheries Conference thru 9 - DC	8	9	10 CCC continued	11 CCC continued
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27 HOLIDAY	28	29	30	31	

North Pacific Fishery Management Council

Eric A. Olson, Chairman
Chris Oliver, Executive Director

Telephone (907) 271-2809

605 W. 4th Avenue, Suite 306
Anchorage, AK 99501-2252

Fax (907) 271-2817

Visit our website: http://www.alaskafisheries.noaa.gov/npfmc

ADVISORY PANEL MINUTES
North Pacific Fishery Management Council
June 4-7, 2012
Kodiak, Alaska

The following (21) members were present for all or part of the meetings:

Kurt Cochran	Jeff Farvour	Matt Moir
Craig Cross	Becca Robbins Gisclair	Theresa Peterson
John Crowley	Jan Jacobs	Ed Poulsen
Julianne Curry	Alexus Kwachka	Neil Rodriguez
Jerry Downing	Craig Lowenberg	Lori Swanson
Tom Enlow	Chuck McCallum	Anne Vanderhoeven
Tim Evers	Andy Mezirow	Ernie Weiss

Minutes of the March 2012 meeting were approved.

C-1(a) Halibut Workshop Report

The AP heard a report on the NPFMC/IPHC Halibut Workshop held in April 2012 from Jane DiCosimo (NPFMC) and Gregg Williams (IPHC).

C-1 (b) GOA Halibut PSC

The AP recommends the Council take final action to reduce halibut PSC limits in the GOA groundfish fisheries.

Preferred Alternative. Amend the GOA Groundfish FMP to remove setting GOA halibut PSC limits from the annual groundfish harvest specifications process. GOA halibut PSC limits would be established (and amended) in federal regulation.

Option 2. Revise the existing 2,000 mt trawl and 300 mt hook and line halibut PSC limits and write them into regulation

Suboption 1. Reduce the halibut PSC limit for hook and line gear CP sector by:
     c) 15%

Suboption 2. Reduce the halibut PSC limit for hook and line gear CV sector by:
     c) 15%

Suboption 3. Reduce the halibut PSC limit for trawl gear sector by:
     c) 15% (267 MT)

All reductions are reflected in Table 1, Part 3 of the supplemental, option 3 – 15% reduction. Reductions are applied to the sideboard limits as reflected in Tables 2, 3 and 4, in Part 3 of the supplemental, option 3 – 15% reduction (see Attachment).

Suboption 3.1.
    a) Applied as percentage against the GOA halibut PSC limit

Suboption 3.2
        Allow the Amendment 80 sector to roll unused halibut PSC from one season to the subsequent season (similar to the non-Amendment 80 sectors).
Suboption 3.3
        Allow available trawl halibut PSC in the second season deep water and shallow water complexes to be aggregated and made available for use in either complex from May 15th through June 30th. Halibut PSC sideboards for the Amendment 80 and AFA sectors would continue to be defined as deep water and shallow water complex in the second season.

        The halibut PSC used during that period will be deducted from where the PSC limit was originally designated for use. NMFS will accomplish this by re-specifying halibut between the deep and shallow complex halibut complexes after the fishery is complete to capture actual use.

        Note: Any unused PSC will be rolled over to the fisheries where it was initially assigned.

PSC limit for HAL demersal shelf rockfish in SE Outside District: status quo of 10 mt.

Motion passed 12-9.

Minority Report on C-1(b), GOA Halibut PSC: A minority of the AP opposed cutting PSC levels in the GOA by 15%, for the following reasons:

The proposed PSC reduction is allocative and responsive to political concerns, not scientifically based, and does nothing to address wastage in the directed halibut fishery. Reduced size at age, the cause of decline is exploitable biomass, is not remedied by bycatch reduction. Reducing target catch of competing species may exacerbate the problem. Age 8+ total biomass and abundance coastwide is high, with strong year classes anticipated in the next several years. If this is an equity issue, PSC levels should be restored as Ebio increases.

Both hook and line CP and all trawl sectors have already experienced significant reductions in PSC caps (1995 longline split; cod sector split; rockfish program off-the-top and rollover reductions). The HAL CP fleet has developed a voluntary coop with internal and external review, 100% observer coverage, careful release, and other measures to minimize bycatch. The diversity between trawl sectors (WGOA, CGOA, CP and CV) precludes that option for trawlers, and realistic reductions under a race for fish have already been implemented. The community of Kodiak and the Nation as a whole will be significantly harmed by reduced bottom trawl deliveries and lost processing jobs under a 15% cap reduction. Rationalization of the fishery will provide tools for more significant PSC reductions, as demonstrated in other programs, and will result in increased observer coverage and possible further increases in PSC limits. The revised observer program will provide much better data on actual catch, bycatch and wastage.

Signed by: Kurt Cochran, Craig Cross, Jerry Downing, Tom Enlow, Jan Jacobs, Matt Moir, Neil Rodriguez, Lori Swanson, Anne Vanderhoeven

C-1 (c) GOA Comprehensive Halibut Bycatch Amendments

The AP recommends that the Council schedule a specific agenda item for the October meeting that begins the process of developing a catch share program for bycatch tools and reductions for the Central Gulf of Alaska trawl groundfish fishery. The Council should develop a purpose and need statement with goals and objectives for a new fishery management system at that time. *Motion passed 20 -1.*

C-1 (d) BSAI Halibut PSC Limits

The AP heard a report on the discussion paper from Marcus Hartley with Northern Economics.

C-2 BSAI HAPC Skate Egg Sites

The AP recommends that the Council release the document for public review. *Motion passed 21-0.*

C-3 (a) BSAI Crab Plan Team Report: Set Catch Specifications for 4 stocks

The AP recommends that the Council approve the BSAI Crab SAFE document. *Motion passed 19-0.*

The AP acknowledges the work the Crab Plan Team has done revising the PSC alternatives and looks forward to revising alternatives for crab PSC in the future. *Motion passed 20-0.*

C-3 (b) Pribilof BKC Rebuilding Plan

The AP recommends that the Council adopt Alternative 2b (Preferred Alternative) for final action. In addition, the AP recommends the following changes to the problem statement:

> *The Pribilof Islands blue king crab stock remains overfished and the current rebuilding plan has not achieved adequate progress to rebuild the stock by 2014. In order to comply with provisions of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) an amended rebuilding plan must be implemented prior to the start of the 2011/2012 fishing season.*
> *The directed blue king crab fishery has been closed since 1999 and action has been taken to limit bycatch mortality in other crab **and groundfish** fisheries occurring near the Pribilof Islands;* ~~however no similar action has been taken for groundfish fisheries.~~ ***Additional action to reduce bycatch in groundfish fisheries may be necessary.*** *Recent trends in crab bycatch suggest that groundfish fisheries occurring near the Pribilof Islands have the potential to exceed the annual overfishing level and acceptable biological catch for this stock.*
>
> *This action is necessary to facilitate compliance with requirements of the MSA to end and prevent overfishing, rebuild overfished stocks and achieve optimum yield.*

Motion passed 18/2.

The AP notes that PIBKC stock boundaries are currently being re-evaluated. Prior to any further action, the AP recommends to the Council:

1. Work be done with NMFS to develop workable means of whole-hauling for PIBKC on trawl vessels participating in fisheries included in any future management actions.
2. Work be done to resolve bycatch extrapolation problems with observer data in fisheries with lower levels of observer coverage (pot, hook and line).

3. Work on genetic and crab movement research for PIBKC to evaluate remaining questions of determining if PIBKC bycatch is comprised of PIBKC, SMBKC or other stocks.
4. Improvements to weight to numbers conversions where average weight is used in lieu of actual weights or numbers.
5. Information be incorporated on seasonal movement and availability of groundfish stocks including effects of ice edge position on assumptions in the model used to look at economic effects of potential closures.
6. Consideration of 100% observer coverage on vessels fishing within the PIBKC stock boundaries.

Motion carried 19/0.

C-5 (a) Freezer Longline GOA cod sideboards

The AP requests that the Council develop a problem statement that includes the following:

- A description of the vessels eliminated from the GOA Pacific Cod fishery at sector split under the recalculated sideboards and the negative impacts that will occur to the crew and operators of these vessels if the current sideboard for these vessels is permanent.
- A description of the effects of narrowing of the sideboard limit under Amendment 83 from a non-gear specific sideboard to a sector specific sideboard and the significantly reduced sideboard limits for those sideboarded freezer longline vessels active in the GOA Pacific cod fishery prior to sector split.

The AP further requests that the Council develop a suite of alternatives that includes the following:

Alternative 1: No Action. Under this alternative, the current Freezer Longline GOA Pacific cod sideboards would continue to apply.

Alternative 2: Removal of Freezer Longline GOA Pacific Cod Sideboards.

Motion passed 18-1.

C-5 (b) Freezer Longline Vessel Replacement (MLOA adjustment)

The AP recommends that the Council release the document for public review with modifications to the options under Alternative 3 provided below:

Alternative 3: The MLOA requirements on LLP licenses with catch processor and hook-and-line Pacific cod endorsements for the BS or AI would not apply and the Council recommends that vessels named on these LLP licenses be authorized for use in the EEZ under the jurisdiction of the North Pacific Fishery Management Council, which is intended to clarify that these vessels are eligible to receive a certificate of documentation consistent with 46 U.S.C. 12102(c) and MARAD regulations at 46 C.F.R. 356.47.

Option 3.1 - Any vessel replaced under this program would not be eligible to be designated on an FFP or an LLP.

Option 3.2 - Replaced vessels may not be used to replace other BSAI hook and line catcher processor vessels.

~~Option 3.3: Any replaced vessel may not exceed 220' LOA.~~

Option 3.3 - The MLOA on LLP licenses with catcher processor and hook-and-line Pacific cod endorsements for the BS or AI would be modified to 220' MLOA.

~~Option 3.4: The MLOA requirements on LLP licenses with catcher processor and pot cod~~
~~endorsements would continue to apply when the LLP is used in BS or AI fishery pot cod fishery.~~
**Option 3.4 - Owners of LLP licenses with catcher processor and pot cod endorsements will
have 36 months from the implementation of this action to _either_ surrender the pot cod
endorsements and receive a LLP license at 220' LOA _or_ the current LLP length restriction
would continue to apply.**

Further, the AP recommends the Council adopt Alternative 3 with revised Options 3.3 and 3.4 as a
Preliminary Preferred Alternative.

Motion passed 19-1.

D-1 (a) Limiting gear on jig vessels

The AP recommends that the Council take no action on this item at this time. *Motion passed 19-0.*

D-1 (b) Gear Specifications for BSAI Greenland Turbot TAC

The AP recommends that the Council move forward an analysis that would consider establishment of
gear allocations for the Bering Sea and Aleutian Islands (BSAI) Greenland turbot fishery.

The AP requests that the Council develop a problem statement that includes the following:

- A description of the Bering Sea and Aleutian Island Greenland Turbot fisheries limited access
derby-style management and the current competition among the trawl and fixed gear sectors.
- A description of the participants in the fisheries who have made long-term investments and are
dependent on the fisheries and uncertainty as a result of the competition for catch shares among
sectors.
- A description of changes in fishing practices resulting from Amendment 80, Amendment 85,
formation of the Freezer Longline Coalition, and Steller sea lion protection measures.

The AP requests that the Council develop a suite of alternatives that includes the following:

Alternative 1: Status quo. Bering Sea and Aleutian Island Greenland Turbot TAC will continue to be
allocated without gear specific split.

Alternative 2: Gear specific fixed gear / trawl gear Bering Sea and Aleutian Island Greenland Turbot
TAC split.

Option 1 - Roll over provisions: Any portion of Bering Sea or Aleutian Island Greenland Turbot
TAC determined by NMFS to remain unharvested by the trawl or fixed gear sectors during the
remainder of the fishery year will become available as soon as practicable to the other sector.

Motion passed 18-2 with 1 abstention.

D-1 (c) BSAI Flatfish Specification Flexibility

The AP recommends initiating analysis of an option to allow Amendment 80 cooperatives and CDQ
groups to access yellowfin sole, rock sole, and flathead sole in excess of their respective TACs in
exchange for an equal quota amount for any of these three species. This option should ensure that
individual species ABCs are not exceeded, and aggregate adjusted TACs do not exceed the 2 million mt

BSAI optimum yield. If potential negative effects are identified, the analysis should suggest options for mitigating these effects. The analysis should include:

Option 1 - Yellowfin sole could be used to fund rock sole/flathead but those species could not be used to fund yellowfin sole (one-way valve).

Option 2 - Limit the amount of rock sole/flathead sole that could be used to fund yellowfin sole.

Transfers between species within the Amendment 80 sector should be able to go back and forth between categories; i.e., a transfer from one species would not preclude transferring back to that species at a later date.

Motion passed 20/1.

D-1 (d) Grenadiers

The AP recommends the Council task the Non-target Species Committee to review the discussion paper to provide recommendations for future action, and report back to the Council at the October meeting.

Motion passed 19-0.

D-1 (e) 5-Year Research Priorities

The AP recommends the Council consider the list of research priorities from the recent IPHC/Council Halibut Workshop as priorities for this 5-year research plan. The AP also recommends that the Council add genetic and crab movement research for Blue King crab to evaluate remaining questions of determining if BKC bycatch is comprised of Pribilof Island BKC, St Matthews BKC, or other stocks.

Motion passed 19-0.

D-1 (f) Programmatic Groundfish SEIS

The AP recommends the Council evaluate the need for a revised PSEIS through a supplemental information report (SIR).

Motion passed 20-0.

D-2 Staff Tasking

The AP recommends the Council take no action on the letter from the Alaska Charter Association if it results in any delay in analysis and approval of the CSP in October.

Motion passed 20-0.

The AP recommends that the Council initiate a discussion paper to remove restrictions on CQE communities buying small blocks of IFQ at least and especially from CQE residents.

Motion passed 19-0.

	Total allowance**	1st season January 20 to April 1	2nd season April 1 to July 1	3rd season* July 1 to September 1	4th season September 1 to October 1	5th season October 1 through December 31
Total Allowance						
seasonal share		27.5 percent	20 percent	30 percent	7.5 percent	15 percent
Total Allowance (15% reduction)	1,705	469	341	512	128	256
Deep-water complex						
seasonal share		12.5 percent	37.5 percent	50 percent*	0 percent	NA
Option 3 - 15% reduction	682	85	256	150 or (341)	0	
Shallow-water complex						
seasonal share		50 percent	11.1 percent	22.2 percent	16.7 percent	NA
Option 3 - 15% reduction	767	384	85	170	128	
Undesignated						
seasonal share						100 percent
Option 3 - 15% reduction	256					256

All values are metric tons, except where noted as percentages.

* Number in bracket is total allocation plus 191.4 metric ton rockfish program halibut PSC allocation.

** The current 2,000 MT limit is reduced by the 27.4 MT Rockfish Program halibut PSC reduction.

^ PSC available: 15% reduction (1,705 MT)

Maintaining current percentages

A80 sideboards   all amounts are tonnages

	Total sideboard	1st season January 20 to April 1	2nd season April 1 to July 1	3rd season July 1 to September 1	4th season September 1 to October 1	5th season October 1 through
Deep-water complex						
Option 3 - 15% reduction	350	19	180	87	2	62
Shallow-water complex						
Option 3 - 15% reduction	114	8	32	24	12	38

All values are metric tons, except where noted as percentages.

* Note: excludes rockfish program halibut PSC allowance and usage.

Rockfish Sideboards

	July sideboard tonnage
Deep-water complex	
Option 3 - 15% reduction	42
Shallow-water complex	
Option 3 - 15% reduction	2

* Excludes rockfish program halibut PSC allowance and deduction.

AFA non-exempt catcher vessels

	Total sideboard	1st season January 20 to April 1	2nd season April 1 to July 1	3rd season July 1 to September 1	4th season September 1 to October 1	5th season October 1 through December 31
Deep-water complex						NA
Option 3 - 15% reduction	47	6	18	24	0	
Shallow-water complex						NA
Option 3 - 15% reduction	257	128	28	57	43	
Undesignated						
Option 3 - 15% reduction	52					52

All values are metric tons, except where noted as percentages.

North Pacific Fishery Management Council

Eric A. Olson, Chairman
Chris Oliver, Executive Director

Telephone (907) 271-2809

605 W. 4th Avenue, Suite 306
Anchorage, AK 99501-2252

Fax (907) 271-2817

Visit our website: http://www.alaskafisheries.noaa.gov/npfmc

Certified: _Dan Bendix_
Date: _9/21/12_

REPORT
SCIENTIFIC AND STATISTICAL COMMITTEE
NORTH PACIFIC FISHERY MANAGEMENT COUNCIL
June 4th – June 6th, 2012

The SSC met from June 4th through June 6th at the Kodiak Inn Harbor Room, Kodiak 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

Sherri Dressel
Alaska Department of Fish and Game

Anne Hollowed
NOAA Fisheries—AFSC

George Hunt
University of Washington

Gordon Kruse
University of Alaska Fairbanks

Kathy Kuletz
US Fish and Wildlife Service

Seth Macinko
University of Rhode Island

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:

Ray Webster
International Pacific Halibut Commission

B-1(c) Advanced Notice of Proposed Rulemaking – revision to National Standard 1 Guidelines
Grant Thompson (NMFS-AFSC) presented this issue. An Advanced Notice of Proposed Rulemaking (ANPR) was published on May 3, 2012, to request comments on potential revisions to the National Standard 1 Guidelines. Comments are due 90 days after publication. Dr. Thompson effectively summarized previous comments by the SSC on earlier NS1 guidelines, reviewed the extent to which these comments were addressed in the revised NS1 guidelines of January 16, 2009 (74 FR 3178), presented relevant recommendations from a Joint Plan Team working group on Total Catch Accounting (TCA), and highlighted several issues that he thought needed attention. The ANPR is wide-ranging in scope and lists 11 topics that have been identified for possible revisions. In addition, NMFS welcomes any other suggestions that would improve the NS1 Guidelines. Public testimony was provided by Merrick Burden (Marine Conservation Alliance) and Arni Thomson (Alaska Crab Coalition).

Because of the broad scope of this action, the SSC plans to convene a working group made up of a subgroup of SSC and Plan Team members that will review the issues listed below, identify any additional issues for consideration, and provide more detailed comments to the Council for consideration.

The ANPR lists the following topics related to NS 1 that NMFS is seeking comments on:
1. Stocks in a fishery
2. Overfishing and multi-year impacts
3. Annual catch limits and optimum yield
4. Mixed-stock fisheries and optimum yield
5. Scientific uncertainty and management uncertainty
6. Data poor stocks
7. ABC control rules
8. Catch accounting
9. Accountability measures
10. ACL exceptions
11. Rebuilding progress and revising rebuilding plans.

Previous comments provided by the SSC raised a number of issues and concerns that were not resolved in the current guidelines, including the following:
1. *Guidelines should be simplified considerably with respect to OFL, ABC, TAC, ACL, etc.* NMFS responded that its language was as simple as possible. Given that the ACL rule has been implemented according to those provisions in the guidelines, the SSC does not wish to reconsider this issue. (Topic #3)
2. *Does SSC advice on "achieving rebuilding targets" occur once or every year?* (Topic 11)
3. *Avoid requiring stocks to be included in multiple FMPs.* (Topic 1)
4. *Further guidance on state-delegated fisheries should be provided.* (New topic)
5. *The document all but rules out using a decision-theoretic approach or other approaches to deal with risk and uncertainty that are not codified in the guidelines.* The need to revisit the treatment of risk and uncertainty in the current guidelines was also highlighted in public comment (Topic 5).

Dr. Thompson informed the SSC that a Joint Plan Team working group on TCA has discussed several outstanding issues that are specific to catch accounting in the Alaska region, but may benefit from additional guidance in the NS1 revisions (Topic # 8 'Catch accounting' in the ANPR). These outstanding issues revolve around the treatment of 'other' catches (e.g., research catches, catches from experimental fishing permits) in assessment and management, specifically the need to distinguish between simply listing catches, using those catches in the estimation of reference fishing mortalities ($F_{40\%}$, $F_{35\%}$, etc.), using those catches to calculate harvest amounts (maxABC, OFL, etc.) based on the estimated reference Fs, and including those catches in the total catch for comparisons against the TAC. Guidance on specific methods for including 'other' catches in the estimation of reference points and for dealing with incomplete time series of historical catches in doing so may also be needed.

Other issues identified in the staff presentation:
- With regard to Topic #1 ("Stocks in the Fishery"), the guidelines should clarify that the MSFCMA requires fishing to be regulated such that the *entire marine ecosystem* is protected, and that regulation is not limited to the fishery's impacts on stocks that are either "in the fishery" or in the ecosystem component.
- With regard to data-poor stocks (Topic #6), the guidelines should emphasize that some stocks are data-poor because there is no fishery that warrants federal management. Perhaps these stocks should be removed from the FMP rather than guessing at appropriate values for the management quantities that would be required to manage a fishery if one actually existed.

2

- The guidelines should clarify that FMPs necessarily contain a variety of accountability measures (Topic #9), and avoid giving the impression that the only accountability required is to prevent ACLs from being exceeded or to correct or mitigate overages of the ACL, if they occur.

Several other issues for consideration were identified in SSC discussions:
- The SSC is concerned that economic considerations (e.g., a focus on "maximum economic yield" or profit maximization), may dominate social and ecological considerations in the specification of TACs and OY (topic #3 in the ANPR). While fishery economic performance is of legitimate interest, it may conflict with competing objectives, needs, and purposes provided for under OY. The guidelines should emphasize that all three dimensions (economic, social, and ecological need to be considered and, in particular, should provide additional guidance on how to account for the social effects of management actions on impacted communities.
- Several SSC members and members of the public noted the need for additional clarification of the concepts of risk and uncertainty and how to account for scientific and management uncertainty (Topic # 5).
- Additional guidance on rebuilding time lines and evaluating rebuilding progress for stocks whose growth may be limited by life history constraints or environmental factors are needed (Topic # 11). The Pribilof Islands blue king crab was cited as one example of this problem.

The working group will review each of the above issues to provide more specific suggestions and may identify additional issues that may help clarify the NS1 guidelines. Draft recommendations will be distributed electronically to the SSC for review and then be provided to the Council for consideration.

C-2 Initial review HAPC-Skate egg concentration sites

Sarah Melton (NPFMC) and David Witherell (NPFMC) provided an overview of an initial review draft EA/RIR/IRFA that describes action alternatives to identify, or identify and protect, up to six HAPC sites of skate egg concentrations in the Bering Sea. Public comment was provided by John Gauvin (Alaska Seafood Cooperative).

The SSC reviewed earlier versions of the initial review draft of this document in February and April 2012 and recommended that the document be returned to staff for additional work. The SSC recognizes the considerable work and resulting improvement in the document since it was last reviewed. **The SSC recommends that the document be released for public review after the following changes to the EA and RIR/IRFA portions of the document have been made.**

In response to our April 2012 comments on the EA, the authors provided clarification on the effects of fishing on the benthic habitat at egg concentration sites, methodology used to estimate the potential number of sites, information on the persistence of egg concentration sites over time, the distinction between information derived from research trawls and standard survey trawls or commercial trawls, and updated the descriptions of gear types and effects on bottom habitat. The SSC requests that the following items be addressed in the EA, prior to release of the document:

- On page 24-25 of the EA, there needs to be clarification on the concentration threshold used to determine the size of the HAPC sites. In particular, clarify the use of the 1,000 eggs/km^2 versus 10,000 eggs/km^2 thresholds in determining the size of the site throughout the EA.
- The total number of potential sites calculated and at the bottom of Table 6 (page 21 of the EA) represents a potential overestimate of the total number of sites, due to double counting of sites with multiple species present. A better estimate of the potential total number of sites is the difference in number of potential sites per species and the number of sites containing those species, summed across species and then added to the total number of known sites (6). This results in 13 to14 potential total sites, not 16 to19 sites.

- Provide more detailed information to support the statement describing the persistence of egg concentration sites over time.
- The document would also benefit from a careful review to fix numerous typos.

This is the third iteration of this draft RIR/IRFA that the SSC has evaluated. The RIR section reflects a very much improved economic impact analysis. The analysts have, by-in-large, been responsive to earlier SSC comments, suggestions, and concerns as these pertained to the RIR. The SSC would, nonetheless, recommend the analysts address the following concerns, to the extent practicable, before release for public review. In several places, the RIR incorrectly confounds the concepts of "harvest" and "value". For example, on page 85, paragraph 2, the text reports, *"Testimony further suggested that the impacts on the maximum potential gross foregone harvest ..."* or, in the fourth paragraph, where it is reported that *"... option c) would result in a maximum foregone catch of approximately $1,599,000 per year."* [emphasis added]. In the first example, the analytical technique is treating "at-risk" catch amounts which, by definition, implies 'gross' foregone harvest (i.e., no offsetting catches made in alternative open areas). In the second example, it is the gross economic value of $1.6 million that is identified, not the catch-amount. Several such misapplications have been identified in our review, and will be forwarded to the analysts for their consideration, along with some additional editorial recommendations.

In section 3.7.1.4 of the RIR, there needs to be an explanation as to why the effect on the fleet of moving to different areas was not presented in the analysis (i.e., due to the small amount of effort displaced).

Our review of the RIR also raised a question at section 4.5 Effects on Management, Monitoring, and Enforcement. The evaluation reflects the reported difficulty the USCG and OLE may have in verifying compliance with "gear-type" mandates and limitations within the subject skate egg HAPC areas. The specific concern cited pertains to distinguishing bottom-trawl gear from pelagic-trawl gear, given that the majority of monitoring and enforcement is anticipated to be accomplished through aerial over-flights of individual fishing operations. The assertion is made that, except in the fortuitous case of a USCG over-flight of a trawler while the terminal gear is on the stern ramp, it would be impossible to differentiate between, much less enforce a ban on only one of the two, trawl gear configurations. While this certainly appears to be factual on its face, it largely ignores the critical fact that 100% observer coverage aboard all trawlers active in the groundfish fisheries in these areas would represent a significant disincentive for use of illegal trawl gear. While referenced in passing in the final paragraph on page 89, the deterrent effect of having a fishery observer physically present on the deck at haul-back, seems to merit more discussion under this subject heading. The SSC recognizes fishery observers are not enforcement agents and should not be placed in that role. Nonetheless, it seems reasonable that an observer's mere presence during the setting and retrieving of the trawl gear, given the very obvious physical differences between bottom and pelagic configurations, could be a compelling and effective deterrent to potential violators. A more considered examination of the 'risk' of detection incurred by a would-be violator of a trawl-type restriction might alter the relative advantage of alternatives that contemplate banning one, as opposed to both, trawl configurations in the proposed HAPC areas.

Finally, for the RIR, the Net Benefit to the Nation summary asserts that *"... the overall net benefit to the Nation would not be expected to change to an identifiable degree ...".* This conclusion appears to be excessively pessimistic. It seems reasonable to conclude, given the EFH Habitat Area of Particular Concern status motivating this Council action, that each of the action alternatives and options would increase the net benefit to the Nation, when contrasted to the Status Quo.

With these observations, and the minor editorial recommendations referenced earlier, the SSC finds the RIR to be a complete and well reasoned analysis of the range of economic and operational outcomes that may accompany adoption of each of the competing HAPC Skate Egg action alternatives.

4

The IRFA, however, is deficient. Presently, the draft IRFA contains substantive errors, conflicting assertions, and incomplete treatment of required RFA elements. While recognizing that a fully compliant IRFA necessarily relies upon a declaration by the Council of a final "preferred alternative" (PA), the shortcomings of this draft extend beyond the PA considerations. The SSC encourages the analysts to reexamine the IRFA, especially sections 5.6 and 5.9. Inconsistencies are apparent in the treatment and interpretation of the entity size criteria, leading to contradictory and erroneous assertions concerning the number of directly regulated small entities to which the action may apply, as well as the nature and distribution of any attributable adverse economic effects. We believe the draft IRFA must be revised and corrected before the package is released for public review.

C-3(a) Crab Plan Team Report, Set Catch Specifications for 4 stocks

At this meeting, the SSC is providing the OFL/ABC recommendations for four crab stocks (Table 1). We also provide modeling advice for Tanner crab and St. Matthew Island blue king crab and recommendations on a variety of other issues. Diana Stram (NPFMC) and Bob Foy (NMFS-Kodiak) presented Crab Plan Team (CPT) recommendations for these four stocks, model reviews, and CPT discussions on a variety of other issues. Public testimony was provided by Linda Kozak (Golden King Crab Harvesters) and John Gauvin (Alaska Seafood Cooperative).

EBS Tanner Crab

Lou Rugolo (NMFS-AFSC) and Jack Turnock (NMFS-AFSC) presented an updated version of the Tanner crab stock assessment model. This model incorporates many of the recommendations made during the CPT meeting in May 2011, the SSC June and October 2011 meetings, the January 2012 modeling workshop and finally the CPT meeting in May 2012. During this time period, the model, data inputs, and model software have been updated numerous times. The SSC would like to express gratitude to the CPT, workshop participants and the assessment authors who have been responsive to requests for changes in model structure and update of data inputs.

The current base model incorporates: 1) two survey selectivity time periods, 2) an additional natural mortality term during the period between 1980 and 1984, 3) rescaled multinomial N values, 4) a revised method for estimating unobserved Tanner crab bycatch in the snow crab and BBRKC fisheries, and 5) a reduction in the fishing mortality penalty from 10 to 1 on the total likelihood. The CPT requested that the authors complete a number of analytical tasks to address a list of issues that should be completed prior to the September CPT meeting, and **the SSC agrees.**

Although a number of issues were identified in the current assessment, the CPT found the model adequately fitted the data sources and was sufficient to describe population dynamics of Tanner crab. The CPT agreed that adequate information was available on maturity and selectivity for the stock to be placed in Tier 3. **The SSC agrees with the CPT and recommends that the model be accepted to manage Tanner crab as a Tier 3 stock.**

Having accepted the Tanner crab model, the CPT also recommended that this Tanner crab model be used to make projections for the rebuilding analysis. Model projections estimate the yield- (catch)-per-recruit, and analysts must identify the level of recruitment (mean recruitment over a specified time-period) that scales the estimate to a measure of absolute abundance. The CPT recommended that the assessment authors bring forward $B_{MSYproxy}$ estimates in September 2012 that are derived by averaging recruitment for a broad range of alternative $B_{35\%}$ definitions. The authors are also allowed to recommend any other subset of mean model year recruitments, so long as they provide justification based on agreed-upon CPT protocols. **The SSC agrees with these CPT recommendations and recommends that the authors bring forward several plausible models using various recruitment time series including a scenario that includes all years with reasonably estimated recruitment.** In addition, the authors should consider a rebuilding alternative that mimics the state harvest policy in the east and west.

Pribilof Islands Blue King Crab

In response to an SSC request, information was presented on the distribution of blue king crabs in the annual trawl survey and PSC in commercial fisheries, size/sex composition of the catch, and actual numbers of blue king crabs observed as PSC compared to extrapolated estimates of total blue king crab PSC. Unfortunately, the new information did not clarify the Pribilof Islands blue king crab stock boundary issue. The problem is that the current blue king crab distribution is not confined to the vicinity of the Pribilof Islands. Instead, blue king crabs are more broadly distributed away from the Pribilof Islands, including into Bristol Bay. Blue king crabs off St. Matthew Island are managed as a separate stock, and blue king crabs also occur off Nunivak Island and in Port Heiden. Thus, the stock assignments of crabs from Bristol Bay are highly uncertain. The CPT considered this issue in May 2012, and concluded that the current boundaries do not adequately describe the Pribilof Islands blue king crab stock, but they were unable to reach a definitive recommendation about specific changes to the boundary. Given these uncertainties, the SSC struggled with this issue, as did the CPT. **As the NMFS trawl survey consistently finds blue king crabs in stations 20 nm east of the Pribilof District, the SSC recommends, as an interim measure, moving the effective stock boundary 20 nm to the east for management purposes.** The following research would help inform this issue: (1) tagging studies to investigate potential movement of blue king crabs from the Pribilof Islands to Bristol Bay and vice versa, (2) collection of crab size measurements of blue king crabs taken as PSC, to understand whether these crabs represent juvenile settlement after larval drift or if instead they represent adult movements, and (3) insights about larval advection by ocean currents, gained from a Regional Ocean Modeling System (ROMS).

St. Matthew Island Blue King Crab

The St. Matthew Island blue king crab fishery had been managed under Tier 4 using a four-stage catch-survey analysis (CSA). However, some issues with the model emerged in 2010 and 2011, raised by the SSC, CPT, and during a crab modeling workshop in February 2011. While the model was being revised in response to these comments since 2010, the ABC and OFL for 2011 were instead calculated based on NMFS trawl survey estimates of mature male biomass and using a 10% buffer to account for uncertainty due to a mismatch between survey station distribution and the distribution of the crab stock. The assessment author has been developing a simpler three-stage CSA, which has undergone review by the CPT and SSC in the past year. The latest version was reviewed by the CPT at their May 2012 meeting and by the SSC at this Council meeting.

The CPT recommended using the three-stage CSA for the fall 2012 fishery and the SSC concurs with this recommendation. The assessment author has clearly described the model structure, data, parameters, and fitting procedure, including provision of the AD Model Builder code. The model fits the survey data reasonably well and residual fits to the three stage proportions are generally well behaved. The CPT has provided some very helpful recommendations to the assessment author, and the SSC supports these recommendations. In addition, the SSC offers the following comments and recommendations:

- Clarify that "recruits" corresponding to stage 1 are recruits to the model, not recruits to the fishery (page 2).
- In the section on model population dynamics, it is stated that the impact of groundfish fisheries on the stock are small. However, the survey-based methods document (Table 4) indicates that 300,000 lbs of blue king crab were caught in fixed gear in 2007/08, resulting in an estimated PSC mortality of 150,000 lbs. Please address this and explain whether the proposed approach adequately addresses such situations.
- On the bottom of page 3, please provide a little more explanation about the abundance index proportionality constants (Qs) and trawl or pot survey abundance indices (As). Are the Qs calculated as the abundance index for any one year divided by the largest abundance index in the

time series? Also, please explain the units for the As. For the trawl survey, are these total area-swept abundances or mean station densities? For the pot survey, do the As represent mean catch per pot?

- On the top of page 4, the stage mean weights are subscripted by year, suggesting that they are estimated annually. However, Table 5 indicates that the means for stage 1 and 2 are fixed and only the stage-3 mean weights are estimated annually. True stage-1 and -2 mean weights would vary by year depending on variability in year-class size and growth rates, so it should be mentioned that fixing these to constants is a simplifying assumption. Are data insufficient to reliably estimate these annually?

- The SSC appreciates the author's attempts to explore various weighting scenarios. As pots are designed to catch crab, one might expect to put a higher weight on the pot survey compared to the trawl survey. However, the trawl surveys are conducted annually and cover a wider area. Some additional explanation for the relative weights applied to pot and trawl surveys would be helpful.

- In eq. (3), stage 3 selectivity is set to unity and the selectivities of the other two stages are estimated in the model. However, the model estimates the trawl selectivity of stage 2 crab to be 1.24 (Table 6). It does not seem plausible that smaller crab (stage 2) would have a higher selectivity than larger crab (stage 3). The Crab Plan Team provided advice on this issue, which the SSC supports.

- The SSC appreciates the four alternative model scenarios that were considered. It would be more helpful if the alternative model fits were plotted with time series of survey estimates, as was done for the preferred model in Fig. 1. For viable alternatives, it would also be useful to plot residuals and other diagnostics, or using retrospective analysis to help confirm the model choice. The SSC is inclined to agree that it is best to estimate mortality for 1998/99, but remains interested in seeing a comparison of fits, as well as the diagnostics mentioned in the text.

- The SSC requests the assessment author work toward future development of both Tier 3 and 4 reference points for this stock, including a description of the quality of data used for each and the author's recommendation for choice of tier level.

- The SSC suggests estimating the natural mortalities corresponding to each size class. This can increase the understanding of the survival of this species directly and avoid confounding the effects of movement and growth on the natural mortality estimate. With the three known size classes, the mathematical symbols are M_1, M_2, and M_3 and they are independent from time t.

- The SSC suggests that the input data be corrected or adjusted for any bias due to the differences arising from data, index, or information collected at different time periods within a year.

- The authors might consider using the "universally optimal" concept from statistical experimental design to determine the weighting of each component of the likelihood. Universally optimal means the estimated variance-covariance matrix of the model is close to a completely symmetric matrix.

- The author might consider plotting the annual estimate of population size that is over the largest size class stated in the model.

Norton Sound Red King Crab

The CPT discussed a request from ADF&G staff to move the timing for specifications for the NSRKC stock to earlier in the year to allow additional time to set the GHL prior to the start of the CDQ portion of the fishery in late May. The author proposed three options:

1. Move the May CPT meeting to March and do specifications for all four stocks and model evaluations prior to the April Council meeting;
2. Have a one day CPT meeting (or possible teleconference) in March to discuss NSRKC only and make recommendations;
3. Set specifications for NSRKC in September, understanding that this would entail dropping data from the assessment, due to the time lag in acquiring the fishery-data.

The main concern is that CDQ fisheries could start in May, before TAC setting had been completed. SSC discussed the different options. The SSC suggested that the Council and ADF&G could also consider an option where preliminary TACs are specified for the upcoming year, which would be amended after the June Council meeting. The minutes of the CPT meeting include a discussion of the pros and cons of the three options. The SSC has deferred a recommendation on moving the specification timing until after the CPT provides their preferred option for next year's ABC/OFL setting.

The 2012 NSRKC assessment addressed the SSC concerns regarding retrospective patterns. The author introduced twelve models for consideration by the CPT. The author's preferred model introduces a high natural mortality on the largest size bin (M=0.648), increases the weight on the commercial CPUE, and reduces the maximum effective sample sizes. The SSC has examined the relative fits of the 12 models, and agrees with the CPT that there are several troublesome issues with the current model including:
- A lack of bycatch data. The CPT requests that some data on bycatch be collected in conjunction with the recently funded NPRB project.
- Length composition data have been downweighted, but there still is apparent conflict within the model. This is a possible indication of model mis-specification.
- A need for better biological justification for the higher natural mortality on animals in the largest length bin (none of the models address dome vs. asymptotic M).
- The recommended model does not fit early data.

The SSC requests that the author carefully consider these issues when preparing for the CPT modeling workshop that will be held in January 2013. In addition, the SSC notes that the current model assumes that selectivity of the trawl survey follows a sigmoid function and Q was estimated 1.0 for length classes 3 through 5. The SSC asks the author to review this assumption given the results of recent studies of trawl survey Q for Bristol Bay red king crab, snow crab and Tanner crab.

The SSC accepted the CPT recommendation that Model 12 be used for OFL and ABC specification. The SSC supports the recommendation that the NSRKC assessment model be reviewed at the January 2013 modeling workshop, particularly in light of requests to set specifications for this stock out of the current sequence in the future. The SSC observed that the current model produces a slightly more conservative estimate of MMB than previous models.

Based on this review, the SSC supports the CPT recommendations that the 2012/13 OFL be set at 0.24 kt and, given the uncertainty with this model noted above, a 10% buffer for the ABC which results in a recommendation of 0.22 kt. The stock is above the MSST and thus the stock is not overfished. The total catch in 2011/2012 did not exceed the OFL and thus overfishing has not occurred.

Aleutian Islands Golden King Crab

The directed fishery on this stock has been prosecuted annually since the 1981-1982 season. There are no biomass estimates, accepted stock assessment model, or comprehensive annual surveys available for this stock. Therefore, the Aleutian Islands golden king crab fishery is managed as a Tier 5 stock.

The OFL calculation incorporates the average ratio of PSC mortality from groundfish fisheries. In previous assessments this has been based on data collected over the 1985/86 through 2008/09 seasons. The authors recommended an alternative (Alt.2) for calculating the PSC mortality rate based on four years of data collected during the 1985/86 through 1995/96 fishing seasons. The CPT agreed with the author's recommendation. The rationale is that PSC mortality during this time frame is a better reflection of PSC mortality in the current fishery. The SSC concurs with the author's and CPT's recommendations.

Based on this approach, **the SSC agrees with the CPT recommendation that this stock continue to be managed using Tier 5 allowing a total catch OFL of 5.69 kt and ABC of 5.12 kt for 2012/2013. The ABC is based on the ABC control rule which specifies a 10% buffer between the OFL and ABC.**

The CPT received a comprehensive review of the sources of catch, catch-rate, and length-frequency data used in the Aleutian Islands golden king crab model. Pot sample data are collected by observers deployed on fishing vessels and retained catch is recorded on fish tickets. Analysts found that there was general agreement between the CPUE estimated from the pot sample data and the CPUE estimated from the fish ticket data. It is the intent of the analysts that these data be incorporated into the AIGKC model and treatments of these data are important to minimize any potential bias in the index.

Much of the SSC discussion was focused on treatment of the data and modeling aspects of the CPUE data. The SSC has the following recommendations for the analysts:
- Use bootstrapping or 'canned' software for the delta-lognormal or similar distributions (Zeileis, A., C. Kleiber and S. Jackman 2008. "Regression Models for Count Data in R." *Journal of Statistical Software*, 27(8). URL http://www.jstatsoft.org/v27/i08/.) to estimate the statistical inference of annual CPUE or index.
- Investigate interactions among factors in the CPUE standardization (seasonally, different vessels, etc.).
- Examine potential post-rationalization correlation between gear and soak time
- Examine changes in seasonality and fishery distribution pre- and post-rationalization
- Provide plots of length frequency data and spatial location of harvest over time to consider changes in harvesting effort and possible issues arising from distributional changes.

Pribilof Islands Golden King Crab
The Pribilof Islands golden king crab fishery has supported a small and sporadic fishery that is concentrated in the Pribilof Canyon region. There was no fishing effort between 2006 and 2009 and only one or two vessels fished in 2010 and 2011 (and in 2012 to date). There is no state harvest strategy in regulation for this fishery and the GHL has been established at 0.15 million pounds (68 t) since 2000. This stock has been managed using Tier 5 with a retained catch OFL for 2009 and 2010 based on average catches during the 1993 through 1998 time period. This short period was chosen because it encompasses the longest continuous time period during which vessels participated in the fishery and during which retained catch data are available and not constrained by a GHL. In last year's assessment, the author recommended, and the SSC accepted, a total catch OFL that is based on the average of the retained catches in 1993 through 1998, an estimate of bycatch rates in the directed fishery during 2001 through 2010, and average bycatch mortalities in the non-target crab fisheries and PSC in the groundfish fishery during 1994 through 1998 and 1992/93 through 1998/99, respectively.

Last year, the CPT and the SSC encouraged the author to explore the use of the eastern Bering Sea slope survey for purposes of moving the stock to Tier 4. The author presented area-swept estimates of biomass for the area of the fishery (Pribilof Canyon) and for the whole EBS slope survey region (200-1200 m depth), as well as the size composition of male and female crab from the 2004, 2008, and 2010 surveys. However, no Tier 4 calculations were presented.

Following the advice of the assessment author and CPT, the SSC recommends a total catch OFL of 0.09 kt (91 t) and ABC (using the 10% buffer for tier-5 stocks) of 0.08 kt (82 t) for 2012/2013, based on Alternative 1 in the assessment, which uses bycatch data for the directed fishery through 2010 only.

For the next assessment cycle, the SSC requests that the slope survey data be used to bring forward Tier 4 calculations because biomass estimates from the slope survey appear reasonable, cover the known

depth range of golden king crab, and size composition data are available to calculate biomass of legal-sized males.

The SSC also notes that the assessment uses calendar year for all calculations except for PSC in the groundfish fisheries, which are estimated based on "crab fishing years". For consistency, the SSC suggests that calendar year be used throughout.

Adak Red King Crab

The SSC reviewed the 2012 SAFE chapter for Adak red king crab (RKC). There is no assessment model for this stock. The fishery has had limited openings since 1995/96 and was closed for the 2011/12 season. **The CPT recommended and the SSC agrees that this stock should be managed as a Tier 5 stock.** The SSC agrees that the OFL should be estimated as average total catch, using the same base period as recommended last year (1995/96 through 2007/08). Based on this designation, the SSC **agrees with the CPT recommendation that the OFL for 2012/13 be set at 0.05 kt (56 t).**

The minimal data available suggest that the Adak RKC stock continues to be at a very low stock size. Evidence to support this conclusion includes: (1) the retained catch declined to low levels in the mid 1970s and has remained at a low level, (2) the last ADF&G Industry Survey was in 2002 and it provided no evidence of populations of sufficient size to support a directed fishery, (3) a pot survey was conducted in 2006 and it provided no evidence of recruitment, (4) the trawl survey of Petrel Bank in 2009 found a small aging population with no expected recruitment, and (5) ADF&G approved a test fishery in 2009 and this yielded a single mature male crab.

The SSC agrees with the CPT recommendation that the directed fishery for Adak RKC should remain closed and that the ABC should be based on an amount sufficient to address bycatch and PSC in other fisheries. The maximum permissible ABC is 48.99 t, based on the 10% Tier-5 buffer. The CPT recommended an ABC of 33.57 t based on the maximum level of bycatch observed during the reference period 1995/96 through 2007/08. However, the SSC continues to disagree with the CPT's rationale for addressing bycatch needs in other crab and PSC in groundfish fisheries. In 2011, the SSC agreed that the Council should include an allowance for incidental capture of Adak RKC in non-directed fisheries. Review of the time series of bycatch and PSC shows an allowance based on the mean bycatch for the period 1995/96 through 2007/08 should be sufficient.

This year, the SSC also considered the amount of Adak RKC needed to prosecute a test fishery. The CPT reported that industry has expressed an interest in conducting a test fishery around the Adak area. ADF&G estimated that 20 t would be needed to prosecute this test fishery. The SSC continues to be concerned about the paucity of data for Adak RKC and places a high priority on the collection of data for this stock. **Therefore, the SSC recommends an ABC of 0.03 kt (34 t) for 2012/13 (the CPT's recommendation). This amount should be sufficient to allow for bycatch and PSC in non-directed fisheries and the proposed test fishery catch.**

Crab PSC in the BSAI Groundfish Fisheries

The CPT considered a Council motion C-2(c) titled "Crab bycatch in the BSAI groundfish fisheries" from the June 2010 Council meeting. The Crab Plan Team recommended retaining Alternative 3 only, because it provides for accountability of crab PSC in the groundfish fishery, and varies PSC limits with crab abundance, thus scaling this conservation measure with the conservation need. The CPT provided a number of constructive comments and the SSC supports their advice on this topic.

Table 1. SSC OFL and ABC recommendations for four crab stocks on June 4th, 2012. Bold indicates where SSC recommendations differ from Crab Plan Team recommendations. (Note diagonal fill indicated parameters not applicable for that tier level while shaded sections are to be filled out for the final SAFE in September 2012)

Chapter	Stock	Tier	Status (a,b,c)	F_{OFL}	B_{MSY} or $B_{MSYproxy}$ (kt)	Years[1] (biomass catch)	2012[2][3] or MMB (kt)	2012 MMB	MMB/MMB_{MSY}	γ	Mortality (M)	2012/13 OFL (kt)	2012/13 ABC (kt)
1	EBS snow crab	3											
2	BB red king crab	3											
3	EBS Tanner crab	4											
4	Pribilof Islands red king crab	4											
5	Pribilof Islands blue king crab	4											
6	St. Matthew Island blue king crab	4											
7	Norton Sound red king crab	4	a	0.18	1.59	1980-current [model estimate]	1.93	1.2		1.0	0.18 0.68 (>123 mm)	0.24	0.22
8	AI golden king crab	5				See intro chapter						5.69	5.12
9	Pribilof Island golden king crab	5				See intro chapter						0.09	0.08
10	Adak red king crab	5				1995/96–2007/08						0.05	0.03

[1] For Tiers 3 and 4 where B_{MSY} or $B_{MSYproxy}$ is estimable, the years refer to the time period over which the estimate is made. For Tier 5 stocks it is the years upon which the catch average for OFL is obtained.
[2] MMB as projected for 2/15/2013 at time of mating.
[3] Model mature biomass on 7/1/2012

C-3(b) Final action Pribilof Is. Blue King Crab rebuilding

The SSC received a presentation of the EA from Diana Stram (NPFMC) and Jennifer Mondragon (NMFS-AKR), and the RIR/IRFA from Scott Miller (NMFS-AKR). Heather McCarty (Central Bering Sea Fisherman's Association) and Arni Thomson (Alaska Crab Coalition) provided comments relevant to this agenda item under the B-1(c) National Standard 1 ANPR agenda item.

The SSC provided comments on the earlier drafts of the rebuilding plan for Pribilof Islands blue king crab stock and was asked at this meeting to provide further comments regarding analytical methods to evaluate the efficacy of the closure described in the current Primary Preferred Alternative (PPA).

In order to evaluate which fisheries have contributed to the PIBKC PSC in the PPA, the analysts used several databases, including: the NMFS Catch Accounting System for PSC estimates of PIBKC (area 513 only), the observer program database for actual observed (only) PSC of PIBKC, and fish tickets for documented recordings of PIBKC PSC. This information was used to estimate PIBKC PSC and perform retrospective spatial extrapolations of the directed catch. Re-projection of directed catch of the target fisheries was spatially limited to 50 nm outside the PPA area closure. The spatial redistribution of catch within the closure area was used to illustrate where the fishery may redistribute when the closure area goes in effect. **Although the re-projection analysis is heavily dependent upon a number of strong assumptions, the SSC recognizes that this approach is reasonable, given available data and information.** There remain two areas that warrant further clarification.

First, the re-projection analysis begins with the assumption that the fleet will be able to fully recover the catch and associated revenue-at-risk in areas outside of the proposed blue king crab habitat conservation zones. However, in some parts of the document, this assumption is described as a "result" or a "conclusion" of the analysis (e.g., page 61 "This analysis concludes that it is likely that some or all of the catch can be made up outside of the smallest proposed closure areas"). This is a circular argument. Because the re-projection analysis begins with the assumption that the catch can be recovered elsewhere, this cannot subsequently be described as a conclusion of the analysis. This should be clarified throughout the document. In general, assumptions associated with the re-projection method need to be better described.

Second, the SSC reiterates its concern about the use of gross revenue at risk as a proxy for economic impacts. If the aforementioned assumption that the fleet will be able to recover the catch elsewhere is valid, then the gross revenue impacts are likely to be negligible. The meaningful economic impacts are more likely to be manifested as an increase in costs. As the document correctly notes, since these cost data are unavailable, it is not possible to conduct a useful analysis of the true economic impacts of the proposed action. Also, there needs to be, at least, a qualitative evaluation of the possible outcomes of vessels not re-supplying at the Pribilof Islands, following adoption of the action alternative.

To be consistent with adopted NMFS terminology, the capture of blue king crab by groundfish fishing operations should be described throughout the document as Prohibited Species Catch (PSC), not bycatch. These forms of removal are not equivalent within the BSAI (and GOA) Groundfish FMP that governs this action. Also, the round weight equivalent value of groundfish is mischaracterized in the text. While the numerical values are unaffected, their interpretation is altered.

C-5(b) Initial review of FLL vessel replacement (MLOA adjustment)

The SSC received a presentation of the subject RIR/IRFA from Diana Evans (NPFMC). Public testimony was offered by Kenny Down, Freezer Longline Coalition.

The SSC commented on an initial review draft at the December 2011 meeting and recommended that the document not be released for public review. The SSC appreciates the efforts of staff to address the

comments provided and finds the document is much improved. There are still deficiencies in the document that need to be addressed before release to the public.

While in some respects, the document is much clearer with regard to the primary source of concern, which is MLOA restrictions and not vessel replacement, this improvement is confounded by numerous references to the status quo as an "impediment" to vessel replacement. This erroneous assertion appears multiple times in the document (e.g., pages vii, 24-25, 39-40). Vessels can be replaced under the status quo, and the SSC received public testimony that at least two new vessels are currently under construction in this fleet. The document should clarify that, although relaxing MLOA constraints under Alternatives 2 and 3 may accelerate the timing of vessel replacement, the status quo does not impede vessel replacement.

In reference to National Standard 4 (page 39), the document asserts that the proposed alternatives "are intended to promote conservation of the groundfish resources in the BSAI and GOA." This statement is not currently supported by the analysis.

While the document acknowledges the potential for fleet consolidation, the document would benefit from more discussion and analysis of the likely resulting impacts from consolidation, such as crew opportunities and effects on coastal communities, and the potential implications of increased harvesting capacity. Depending upon the level of consolidation expected from the alternatives, some discussion of the "excessive share" clause in NS 4 may be warranted. On page 40, during the discussion of National Standard 8, the document asserts that this action is "not expected" to have an adverse effect on coastal communities. There is little evidence provided in support of this assertion and, indeed, it appears that if the fleet is consolidated, it is possible that some communities may be affected.

Under the discussion of National Standard 9, the document asserts that replacement vessels could reduce bycatch and PSC. While this may be the case, the document would benefit from a brief discussion that supports this assertion.

On page 26, the document mentions anecdotal evidence that there is pressure to improve crew quarters. This is not relevant to the action at hand and should be removed from the document.

The claim (page 40) that "[t]he impacts on participants in the freezer longline groundfish fisheries in the BSAI, and participants in other fisheries, have been comprehensively evaluated" is unsupported.

The data for Table 3 are missing. Figure 1 is missing.

The first sentence in Section 3.3 (page 40) refers to the GOA when presumably the BSAI is intended.

Tables 10 and 13 indicate that sablefish harvests by the FLL fleet are noticeably declining, but no explanation is given. These sablefish catch estimates should be checked for consistency with those reported in the SAFE. Are the declines due to TAC reductions in the IFQ fishery or is there another explanation?

The SSC recommends release of the draft document for public review after addressing the principal concerns identified by the SSC and resolving editorial problems.

D-1(e) Review and approve 5-year research priorities
During the June 2012 SSC meeting, it became clear that a more orderly process of submitting and prioritizing proposals for research priorities is needed. The SSC received the Council's list of research priorities from June 2011 and research priority lists from three Plan Teams, a halibut workshop report, a stakeholder-based research plan for the Aleutians, and staff summaries of EFH and protected species research. The lists were in different formats and some were quite lengthy. Thus, the SSC did not have

time to fully consider all the lists and requested changes. In particular, we did not have sufficient time to review the research in the halibut workshop report and incorporate that into our priorities. We recommend that the BSAI/GOA Plan Teams consider the research recommended in that report and, as appropriate, incorporate those of merit into their research priorities list this fall. **The SSC provides its recommended list of research priorities to the Council in Appendix A, which follows at the end of this June SSC report and will provide Council staff with a track changes and commented version of the list. In addition, the SSC proposes the following be considered for adoption by the Council as policy for the submission of Research Priorities to the SSC.**

The SSC will consider research priorities for inclusion in the annual NPFMC list of Research Priorities from the Plan Teams and members of the SSC. The SSC prefers to have Plan Teams be the initial filter for research priorities that come to the SSC. Sometimes EFH, protected species, and other issues relevant to a particular FMP may not be fully considered by each Plan Team, but the SSC recommends that Plan Teams make a more concerted effort to do so. Research priority lists should be provided by the Plan Teams in their Plan Team report, ideally to be received by the SSC no later than two weeks prior to the Council meeting at which the Plan Team Report is presented. The proposed research priorities should be entered in "Track Changes" in the Council's list of Research Priorities, as "published" in the minutes of the previous year's June Council meeting. The SSC will update a working copy of the Research Priorities list at each meeting at which it receives a list of priorities from a Plan Team, and will provide the Council with the full revised list at the June NPFMC meeting.

The SSC suggests that the Council consider adopting a process of evaluating and organizing the list of proposed Research Priorities using an Excel file or relational database type of system, with research priorities submitted on an Excel-based form to collect information about the proposed priority. When such a system is operational, the proposed research would include information on the question or data need to be resolved, whether the priority is an immediate concern or an ongoing need, relative rank (high, medium, low) among all priorities submitted by that Plan Team, impact on decision making, and species or fishery affected. Separate worksheets or database tables could be established for each Plan Team, the SSC, and the Council.

D-1(g) Pacific cod assessment models
Grant Thompson (NMFS-AFSC, and Pacific cod stock assessment author) presented Plan Team recommendations for models to consider in the 2012 preliminary Pacific cod assessment. These recommendations were based on proposals by the senior assessment author, the Plan Teams, the SSC, and the public. Following the process established in recent years, all proposals were evaluated and suggestions were allocated to a set of requested models for the 2012 preliminary assessment.

Eastern Bering Sea. Four models were recommended by the joint Plan Teams for Eastern Bering Sea, as well as one additional model recommended by the senior author:
- Model 1: Last year's final model (model 3b)
- Model 2: Last year's final model with re-tuned catchability
- Model 3: Last year's final model with new fishery selectivity in 2008 or 2010
- Model 4: Last year's final model without age data
- In addition, the senior author recommends a model similar to one brought forward in last year's preliminary assessment that addresses many of the suggestions received from the Plan Teams, SSC, CIE reviewers, and the public.

The SSC agrees with the selection of last year's final model as the baseline and with the proposed suite of alternative models. However, we note that there are limited data to assess any effects resulting from the creation of longline cooperatives in 2010 on fishery selectivity (Model 3). **Hence, the SSC recommends evaluation of a change in fishery selectivity in 2008 (in response to Amendment 80), but no change**

in 2010. In addition, we note that stock assessment authors are free to develop and bring forward an alternative model or models in both the preliminary and final assessment. However, given the Plan Team's (and SSC's) reluctance in previous years to consider a new author-recommended model in the fall that incorporates a large number of potentially influential changes in a single model (for example changes in growth, selectivities, and catchability), the SSC encourages the authors to evaluate changes in one or a few structural elements at a time.

Aleutian Islands. The SSC agrees with the Plan Team recommendation that the author bring forward a preliminary model for the Aleutian Islands *if there is enough time.* The author noted the lack of age data for the Aleutians Pacific cod stock, and the SSC agrees that length data should be used for all years (including for any year with age data). Authors should consider age composition sample size needs for the assessment and request aging of current sample collections for next year's assessment.

Gulf of Alaska. As for the EBS, the SSC agrees with the choice of last year's final model (formerly model 3, new model 1) as the baseline model for the Gulf of Alaska and a second model (model 2) that re-tunes catchability to match the empirical estimates from Nichol et al. (2007).

Catchability of Pacific cod in the survey remains one of the major unresolved issues. The SSC looks forward to ongoing research that will use acoustic technology (DIDSON) and gear comparisons to assess the catchability of cod in the GOA and EBS trawl survey gear. **We encourage the authors to incorporate results from these studies in this year's assessment to the extent practicable. This would involve tuning Model 2 to new estimates of catchability should they become available in time.**

The SSC also noted that the process of vetting models through a workshop and the Plan Team seems to be working well and should be used as long as model proposals are received from the public.

D-1(h) Receive report of the Recruitment Workshop
Grant Thompson (NMFS-AFSC) presented a Phase 1 report about a workshop dealing with issues related to spawner-recruit relationships (SRRs) held in Seattle and via Webex in April 2012. Holding this workshop was an SSC recommendation that resulted from an SSC workshop on recruitment issues at its February 2012 meeting. Attendees included members from the groundfish and crab Plan Teams, SSC members, stock assessment scientists, and members of the public. A working group was formed to report on the workshop. A final report is planned for review by the groundfish Plan Teams in September 2012 and by the SSC in October 2012. The workshop was held in April in order to provide guidance to the crab Plan Team at its May meeting.

The Phase 1 report covers three main topics: (A) how to identify regime shifts, (B) how to establish objective and consistent criteria for excluding individual years from a time series of recruitment estimates, and (C) how to forecast recruitment with environmental forcing. Current practice for groundfish is to use recruitment estimates from 1977 and later. Current practice for crab is to establish time periods for recruitment estimates with consideration of regime shifts, as identified through examination of changes in life history characteristics of the species and ecosystem characteristics.

The Phase 1 report should be viewed as preliminary. For topic A, the report identifies six alternatives for determining regime shifts, several of which involve breakpoint analysis. The recommended method is to fix the productivity parameter in the SRR and allow the scale parameter to differ between regimes. The workgroup and the SSC noted that for most alternatives a decision theory approach could also be used.

For topic B, the report identifies five alternatives for establishing criteria to exclude specific recruitment year classes, several of which involved excluding the last X years or excluding years with high absolute

or relative coefficients of variation. The report recommends a default of excluding the three most recent year-class estimates.

For topic C, the report identifies two alternatives that address whether or not to use environmental forcing in forecasting recruitment. The report recommends that we recognize that current knowledge of environmental forcing is insufficient to use when forecasting recruitment.

At its May 2012 meeting, the Crab Plan Team considered the results from the Phase 1 report. With regard to topic A, the team will develop software for breakpoint analysis, so that methodology will be standardized and attempts will be made to identify environmental covariates. With regard to topic B, the effect of tier status and fishing history are two factors that will be considered when determining what years to exclude. As a default, the full time series will be used after excluding the last three years, unless there is compelling evidence for a change in productivity. With regard to topic C, the team will follow the report's preliminary recommendation not to incorporate environmental forcing when forecasting recruitment.

The SSC views the April workshop as a great success and thanks Dr. Thompson for his clear presentation. The SSC agrees that the recommendations made in the Phase 1 report should be viewed as preliminary until the report is finalized and it receives review by both the Crab and Groundfish Plan Teams. The SSC notes that environmental forcing need not express itself through regime shifts and urges researchers to also consider environmental events and relationships. The SSC requests thorough documentation of the breakpoint analysis and software, including assumptions and statistical methodology or modeling. The SSC would also like to see some discussion of how workshop recommendations affect determination of virgin (or unfished) biomass. The SSC also suggests that life history, length frequency distribution, and ecosystem considerations could be useful in refining recommendations about analyzing SRRs. The SSC suggested that the Plan Teams consider life history when selecting the years to exclude from the time series. The SSC anticipates that a deliberative process will be needed to finalize recommendations and so does not expect all recommendations to be implemented until 2013. The SSC looks forward to the final workshop report.

Appendix A.

SSC's Five-Year Research Priorities: 2012 through 2016 (as proposed in June 2012)

The Scientific and Statistical Committee (SSC) has identified priorities for research in the next 1 to 5 years as those activities that are the most important for the conservation and management of fisheries in the Gulf of Alaska, Aleutian Islands, eastern Bering Sea, and the Arctic. This listing of priorities has two purposes: 1) to meet the requirements of the revised Magnuson-Stevens Act for the Councils to identify research that is needed in the next 5 years, and 2) to provide guidance on research priorities to the research community and to funding agencies.

The research priorities are separated into two categories: **Immediate Concerns** and **Ongoing Needs**. **Immediate Concerns** include research activities that must be addressed to satisfy federal requirements and to meet pressing fishery management and ecosystem issues related to fishery management. Within these categories, the SSC has indicated those Research Priorities for which **Research is Underway**. These are Research Priorities for which NPRB grants have been awarded or for which it is known to the SSC that one or more other agencies have undertaken the recommended research. These priorities will remain on the list until the recommended research is complete and evaluated in terms of its meeting the Research Priority that had been listed. **Ongoing Needs** include research to advance the Council's fisheries management goals as defined in the Groundfish PSEIS, other strategic documents of the Council (i.e., FMPs, AI FEP, and EFH, crab, salmon PSC, and other EISs) and NMFS. **Ongoing Needs** include efforts on which the assessment models depend for their annual updates. For example, without the survey information, the annual process of setting ABCs and OFLs for the managed stocks would be compromised. The Council sees these efforts as needed on an ongoing basis, and constituting the time series on which management is based. It should be recognized that research in these categories is being conducted or may be conducted through Federal, State of Alaska, North Pacific Research Board, and other funding sources.

Five-Year Research Priorities: 2012-2016

Immediate Concerns

I.   Fisheries

A.   Fish and Fisheries Monitoring

1.   Non-recovering stocks. A pressing issue is why certain stocks have declined and failed to recover as anticipated (e.g., Pribilof Island blue king crab, Adak red king crab). Research into all life history components, including predation by groundfish on juvenile crab in near-shore areas, is needed to identify population bottlenecks, an aspect that is critically needed to develop and implement rebuilding plans.

2.   Improvements are needed for catch accounting by sex and size for crab (genetic samples) in non-directed fisheries with high bycatch   or PSCrates, particularly for blue king crab in the Pacific cod pot fishery in the Pribilof Islands.

3.   Develop methods for reliable estimation of total removals (e.g., surveys, poorly observed fisheries) to meet requirements of total removals under ACLs. Improve species identification, by both processors and observers, for priority species within species complexes in catches. Methods that quantify and correct for misidentifications are desired.

4.   There is a need to characterize the spatial distribution of male snow crab relative to reproductive output of females in the middle domain of the EBS shelf (partially underway)

B.   Stock Assessment

1.   Improve handling mortality rate estimates for crab and scallops.   For crab, improved understanding on the post-release mortality rate of discarded crab from directed and non-directed crab pot fisheries and principal groundfish (trawl, pot, and hook and line) fisheries is required. The magnitude of post-release mortality is an essential parameter in the determination of total annual catch used to evaluate overfishing in stock assessment and projection modeling. For example, assess discard mortality rates of Tanner crab by size, month, sex, and fishery type. For scallops, conduct field studies to estimate scallop discard mortality (specifically the relationship between capture, release condition, and survival of scallops). (crab studies are partially underway: *Chionocetes* RAMP study)

2.   Develop biomass indices for lowest tier species (Tier 5 for crab, Tier 6 for groundfish), such as sharks, and conduct net efficiency studies for spiny dogfish. Explore alternative methodologies for Tier 5 and 6 stocks, such as length-based methods or biomass dynamics models.

3.   Owing to the lack of fishery-independent surveys for scallops, there is a need for analyses of fishery CPUE and observer data for use in assessing fishery performance and stock assessment. For instance, sharp declines in CPUE have occurred in some areas, such as Kayak Island and Alaska Peninsula, prompting concerns about local depletion. Additional new techniques may be desirable in regions with data-poor stocks.

4.   New information and data are needed that would inform our understanding of the spawner - recruit relationship for groundfish and crab with sufficient precision to project year-class strength (e.g., Tanner crab, GOA pollock, sablefish, halibut). (Underway)

5.   Conduct studies to determine stock structure and potential spatial management for BSAI pollock (e.g., movement).

6.   Conduct district-wide surveys for demersal shelf rockfish in Southeast Alaska on an annual, biennial, or triennial basis.

7.   Conduct a tagging study of red king crab in the region north of Bristol Bay to assess the movement between this region and the Bristol Bay registration area. Similar work on blue king crab in Bristol Bay relative to the Pribilof Islands is needed.

8.   Research is needed on the vertical distribution of Pacific cod relative to the EBS bottom trawl and comparisons between the EBS and GOA trawl gear. (Underway).

9.   Develop Pacific cod stock assessment for the Aleutian Islands region.

10.   Tagging studies of Aleutian Islands Pacific cod and Atka mackerel are needed to create models of short-term movement of fish relative to critical habitat (tagging for Atka mackerel partly underway).

11.   Studies are needed to validate and improve age determination methods for Pacific cod, Pacific sleeper sharks, and spiny dogfish. Conventional tagging studies of young of the year and/or one-year old Pacific cod would be useful in this regard (partially underway for cod and dogfish).

12.   Maintain the core data from the eastern Bering Sea needed to support a diverse suite of models used to support the integrated ecosystem assessment program for the Bering Sea. Core data include inputs for single- or multi-species management strategy evaluations, food web, and coupled biophysical end-to-end ecosystem models (e.g. biophysical moorings, stomach data, zooplankton, age 0 surveys).

C.   Fishery Management

1.   Develop a research program that will facilitate evaluation of salmon (both Chinook and non-Chinook) PSC mitigation measures in the BSAI and GOA. This includes updated estimates of the amounts reasonably necessary for subsistence, timing of runs and openings relative to subsistence requirements, and access to cost data for the commercial pollock and salmon industries so that impacts on profits (not gross revenues) can be calculated.

2.   Improve the resolution of Chinook and chum salmon genetic stock identification methods (e.g., baseline development, marker development), improve precision of salmon run size estimates in western Alaska, and initiate investigations of biotic and abiotic factors influencing natural mortality rate during ocean migration in the GOA and BSAI. (baseline development is nearing completion, more work on Cook Inlet Chinook and chums is needed)

3.   Develop improved catch monitoring methods of fishery interactions including direct and alternative options (e.g., electronic logbooks, video monitoring), particularly on smaller groundfish, halibut, and commercially guided recreational fishing vessels, as well as an assessment of feasibility for small vessels. Investigate factors that affect angler demand in the guided angler sector of the halibut fishery resulting from regulatory changes or general economic conditions.(Underway)

4.   Develop bioeconomic models with explicit age- or size-structured population dynamics for BSAI and GOA groundfish fisheries to estimate maximum economic yield and other bioeconomic reference points under uncertainty.

5.   Research the benefits and costs of halibut and halibut PSC utilization in different fishing sectors. For halibut and other PSC and bycatch species, conduct research to better identify where regulations restrict the utilization of fish from its most beneficial use and evaluate how changes in existing regulations would affect different sectors and fisheries. (partially underway)

6.   Initiate/continue research on developing and evaluating thresholds for ecosystem indicators, including ecosystem-level management strategy evaluation.

II.   Fisheries Interactions

A.   Protected species

1.   Studies of the localized interactions between fisheries and protected species, such as interactions between Steller sea lions and commercial fish species in the Central and Western Aleutian Islands (particularly areas 541, 542, 543), are needed. These studies should be conducted at appropriate spatial and temporal scales with an emphasis on seasonal prey fields, diet, and movement of sea lions and their prey.

2.   Assess age- and size-specific vital rates (i.e., reproduction and survival) of Steller sea lions in the western and central Aleutians at sufficient frequency to track population dynamics in the western DPS.

3.   Assess possible indirect effects of fisheries removals via periodic health assessments, indices of body condition, survival of pups and juveniles, and pup-non pup ratios of Steller sea lions in the eastern DPS.

4.   Quantify killer whale predation of Steller sea lions, particularly in the western and central Aleutian Islands.

5.   Develop new methods to estimate sea lion abundance, such as the use of unmanned aerial vehicles, which could increase the probability of acquiring abundance estimates in remote areas. (underway)

6.   Assess the impact of the displacement of the groundfish fleet due to Steller sea lions protection measures on the prey availability, foraging ecology, diet, movements, and vital rates for Northern fur seals (partially underway).

7.   Assess the extent and impact of seabird incidental takes in fisheries on bird populations, and develop methods to reduce seabird incidental takes, particularly of protected species, such as short-tailed albatross.

8.   Determine potential impacts of fishing activities on North Pacific right whales and the Eastern North Pacific blue whales in the GOA, particularly in identified critical (NPRW) or essential (NPBW) habitat.

III.   Habitats

A.   Evaluate habitats of particular concern:

1.   Assess whether Bering Sea canyons are habitats of particular concern, by assessing the distribution and prevalence of coral and sponge habitat, and comparing marine communities within and above the canyon areas, including mid-level and apex predators to neighboring shelf/slope ecosystems. (partially underway)

B.   Baseline Habitat Assessment

1.   Dynamic ecosystem and environmental changes in the northern Bering Sea and Arctic are occurring on a pace not observed in recorded time. In response to the new Arctic FMP, assessment of the current baseline conditions and trophic interactions is imperative. This effort, while of great scientific importance, should not supplant the regular surveys in the BSAI and GOA, which are of critical importance to science and management. (partially underway)

C.   Fishing Effects on Habitat

1.   Research is needed on the effects of trawling on the distribution of breeding and ovigerous female red king crab and subsequent recruitment. Relevant studies include effects of potential habitat modifications on the distribution of females, particularly in near-shore areas of southwest Bristol Bay (partially underway), and environmental effects (e.g., trawling overlap in warm vs. cold years). Retrospective studies, the use of pop-up tags to identify larval release locations, and larval advection using Regional Ocean Modeling System would help address this need.

2.   Impact of bottom trawl fisheries on invertebrate abundance and species composition in benthic habitats, especially as might be relevant to the foraging ecology of walrus (candidate species for listing under ESA), but also bearded seals (ESA determination due in July), and gray whales.

Ongoing Needs

I.   Fisheries

A.   Fish and Fishery Monitoring

1.   Continuation of State and Federal annual and biennial surveys in the GOA, AI, and EBS, including BASIS surveys and crab pot surveys, is a critical aspect of fishery management off Alaska. It is important to give priority to these surveys, in light of recent federal budgets in which funding may not be sufficient to conduct these surveys. Loss of funding for days at sea for NOAA ships jeopardizes these programs. These surveys provide baseline distribution, abundance, and life history data that form the foundation for stock assessments and the development of ecosystem approaches to management. *Although an ongoing need, these surveys are considered the highest priority research activity, contributing to assessment of commercial groundfish and crab fisheries off Alaska.*

2.   Conduct routine subsistence use, fish, crab, and oceanographic surveys of the northern Bering Sea and Arctic Ocean. These surveys will become increasingly important under ongoing warming ocean temperatures because range expansions of harvested fishery resources may occur. If range expansions or shifts occur, data will be needed to adjust standard survey time series for availability.

3.   Explore alternative approaches to the triennial ADF&G Aleutian Islands golden king crab pot survey to acquire fishery-independent abundance data on stock distribution and recruitment, including the potential for future cooperative research efforts with industry.

4.   Continue and expand cooperative research efforts to supplement existing surveys to provide seasonal or species-specific information for use in improved assessment and management. The SSC places a high priority on studies that provide data to assess seasonal diets and movements of fish and shellfish, for use in studies of species interactions in spatially explicit stock assessments.

5.   The HAPC action for skate egg case concentration sites included two recommendations that the Council suggested should be addressed during the annual research priority discussion: (a) skate egg case concentrations should be monitored every 2 to 3 years using non-invasive research design, such as in situ observation; and (b) skate conservation and skate egg concentration areas remain a priority for EFH and HAPC management and within Council and NMFS research plans.

6.   For groundfish in general, and rockfish in particular, continue and expand research on trawlable and untrawlable habitat to improve resource assessment surveys. For example, improved surveys, such as hydro-acoustic surveys, are needed to better assess pelagic rockfish species that are found in untrawlable habitat or are semi-pelagic species, such as northern and dusky rockfish.

7.   Studies are needed to evaluate effects of the environment on survey catchability. For groundfish and crabs, studies are needed on catchability, as it directly bears on estimates of the stock size for setting of catch quotas. Research to refine the estimates of survey catchability, q, used to infer absolute, rather than relative, abundance would substantially improve the quality of management advice. Particular emphasis should be placed on Tanner crab, because of recent trends in stock status, and on fishery and fishing gear selectivity for Aleutian Island golden king crab to improve the stock assessment model.

8.   Continue research on the design and implementation of appropriate survey analysis techniques, to aid the Council in assessing species (e.g., some crabs and rockfish) that exhibit patchy distributions and, thus, may not be adequately represented (either over- or under-estimated) in the annual or biennial groundfish surveys.

9.   Advance research towards developing a quantitative female reproductive index for the surveyed BSAI crab stocks. Research is needed on mating, fecundity, fertilization rates, and, for snow and Tanner crab, sperm reserves and biennial spawning, to develop annual indices of fertilized egg production that can be incorporated into the stock assessment process and to model the effects of sex ratios, stock distribution, and environmental change on stock productivity. Priority stocks for study are eastern Being Sea snow and Tanner crab and Bristol Bay red king crab. (Ongoing for snow crab and red king crab)

10.   Expand existing efforts to collect maturity scans during fisheries that target spawning fish (e.g., pollock). Time series of maturity at age should be collected to facilitate the assessment of the effects of density-dependence and environmental conditions on maturity.

11.   Identification and recovery of archived data (e.g., historical agency groundfish and shellfish surveys) should be pursued. Investigate integrating these data into stock and ecosystem assessments.

12.   There is a need for fishery-independent surveys of scallops on major fishing grounds, e.g., Yakutat, other areas.

13.   Develop a long-term survey capability for forage fish (partially underway).

C.   Stock Assessment

1.   Acquire basic life history information needed for stock assessment and bycatch/PSC management of data-poor stocks, such as scallops, sharks, skates, sculpins, octopus, grenadiers, squid, and blue king crab (Bering Sea), golden king crabs (Aleutian Islands), and red king crab (Norton Sound). Specifically, information is needed on natural mortality, growth, size at maturity, and other basic indicators of stock production/productivity). For octopus, there is particular need for estimates of mortality and abundance, including verification of the cod consumption-based approach. Tagging studies would provide information on growth and movement of scallops and growth and absolute abundance estimates for golden king crab.

2.   Improve estimates of natural mortality (M) for several stocks, including Pacific cod and BSAI crab stocks. **Develop and validate aging methods for crabs to improve estimates of M, including improved independent estimates of stage-specific M (e.g., large red king crab in Norton Sound).**

3.   Studies are needed to validate and improve age determination methods for Pacific cod, Pacific sleeper sharks, and spiny dogfish. (partially underway for Pacific cod and spiny dogfish)

4.   Evaluate the assessment and management implications of hybridization of snow and Tanner crabs.

5.   Quantify the effects of historical climate variability and climate change on recruitment and growth, and develop standard environmental scenarios for present and future variability based on observed patterns. There is also a clear need for information that covers a wider range of seasons than is presently available.

6.   There is a need for the development of projection models to evaluate the performance of different management strategies relative to the Council's goals for ecosystem approaches to management. Projection models are also needed to forecast seasonal and climate related shifts in the spatial distribution and abundance of commercial fish and shellfish. (partially underway)

7.   To identify stock boundaries, expanded studies are needed in the areas of genetics, mark-recapture, reproductive biology, larval distribution, and advection.

8.   Develop spatially explicit stock assessment models, where appropriate. High priority species for spatially explicit models include: snow crab, walleye pollock, Pacific cod, sablefish, yellowfin sole,

22

rock sole, arrowtooth flounder, Pacific ocean perch, black spotted rockfish, rougheye rockfish, and Atka mackerel. (partially underway for some species)

9. Genetic studies to provide information on sources and sinks for scallop larvae are needed to improve our understanding of the rate of larval exchange between scallop beds. Age-structured models for scallop assessment are also needed.

10. Conduct multivariate analysis of bycatch data from the scallop observer program (haul composition data) to estimate abundance and trends of benthic communities on scallop beds and computerized image processing to facilitate scallop stock assessments from camera sled (CamSled) data.

D.   Fishery Management

1. Refine methods to incorporate uncertainty into harvest strategies for groundfish for ACL estimation. Continue existing management strategy evaluations at the stock level. (underway)

2. Conduct studies documenting the subsistence harvest patterns, norms, and quantities in communities that depend upon resources that may be affected by Council action.

3. Examine interactions between coastal communities and commercial fisheries (e.g., subsistence-commercial linkages, adaptations to changes in resource use, economic opportunities for coastal communities).

4. Evaluate the effectiveness (e.g., potential for overharvest or unnecessarily limiting other fisheries) of setting ABC and OFL levels for data-poor stocks (Tier 5 and 6 for groundfish and Tiers 4 and 5 for crab, e.g., squid, octopus, shark, sculpins, other flatfish, other rockfish, skates, grenadier, and crab). Research is needed to refine the basis for setting gamma for Tier 4 crab stocks. (partially underway)

5. Conduct retrospective analyses to assess the impact of Chinook salmon PSC measures on the BSAI pollock fishery. Analyses should include an evaluation of the magnitude and distribution of economic effects of salmon avoidance measures for the Bering Sea pollock fishery. In this case, it is important to understand how pollock harvesters have adapted their behavior to avoid Chinook and "other" salmon, under various economic and environmental conditions and incentive mechanisms.

6. Develop forecasting tools that incorporate ecosystem indicators into single or multispecies stock assessments, to conduct management strategy evaluations under differing assumptions regarding climate and market demands. Standardization of "future scenarios" will help to promote comparability of model outputs.

7. Development of an ongoing database of product inventories (and trade volume and prices) for principal shellfish, groundfish, Pacific halibut, and salmon harvested by U.S. fisheries in the North Pacific and eastern Bering Sea.

8. Analyze current determinants of ex vessel, wholesale, international, and retail demand for principal seafood products from the GOA and BSAI.

9. Conduct pre- and post-implementation studies of the benefits and costs, and their distribution, associated with changes in management regimes (e.g., changes in product markets, characteristics of quota share markets, changes in distribution of ownership, changes in crew compensation) as a consequence of the introduction of dedicated access privileges in the halibut/sablefish, AFA pollock, and BSAI crab fisheries. "Benefits and costs" include both economic and social dimensions.

10. Conduct prospective analyses of the robustness and resilience of alternative management strategies under varying environmental and ecological conditions.

11. Conduct prospective and retrospective analyses of changes in the spatial and temporal distribution of fishing effort, in response to management actions (e.g., time/area closures, marine reserves, PSC and other bycatch restrictions, co-ops, IFQs).

12. Develop a framework for collection of economic information on commercial, recreational, and charter fishing, as well as fish processing, to meet the requirements of the MSFCMA sections 303(a)(5, 9, 13), 303(b)(6), and 303A.

13. Continue to evaluate the economic effects from crab rationalization programs on coastal communities. This includes understanding economic impacts (both direct and indirect) and how the impacts are distributed among communities and economic sectors.

14. Improve estimation of fishery interactions (including catch) with marine mammals (e.g., state managed gillnet fisheries), seabirds, and non-target groundfish (e.g., sharks, skates), and protected species.

II.   Fisheries Interactions

A.   Protected Species Interactions

1. Economic, social, and cultural valuation research on protected species (i.e., non-market consumptive use, passive use, non-consumptive use), particularly in the Arctic.

2. Foraging ecology and vital rate studies of Steller sea lions in the Gulf of Alaska, Russian Far East, and Commander Islands, including at-sea tracking of older animals, and diet composition of sea lions throughout the region. Emphasis should be placed on the use of methods that allow population abundance estimates to be directly compared between Russia and Alaska.

3. Linkages between fishery-induced disturbance or local prey depletion for northern fur seals in the Pribilof Islands region. (underway)

4. Gear modifications and fishing practices to reduce bycatch and, particularly, PSC (e.g., salmon and crab). (partly underway)

5. Studies of sperm whale depredation of catch in long-line fisheries and surveys to improve the quality of long-line fish abundance estimates. (underway)

6. Monitor interactions between fishing fleet and protected seabirds, particularly, in Aleutian Islands and the eastern Bering Sea shelf edge where numbers of albatross have increased.

7. Assess the potential for increased interactions between protected species (i.e., large whales and post-breeding/migrating seabirds) and fishing efforts in essential habitats, in particular throughout migratory routes, and with respect to changes in fish stock distribution and/or expansion into Arctic waters.

B.   Bycatch/PSC Issues

1. There is a need to analyze the effects of recent Council actions on bycatch and PSC, including:
      a.   interaction among PSC reduction initiatives (e.g., halibut, salmon)
      b.   quantifying the effects of PSC reduction in groundfish fisheries to the target fisheries (e.g., charter and commercial halibut fisheries, salmon fisheries)
      c.   Research approaches to create bycatch and PSC reduction incentives.

III.   Habitat

A.   Habitat Mapping

1. Improved habitat maps (especially benthic habitats) are required to identify essential fish habitat and distributions of various substrates and habitat types, including habitat-forming biota, infauna, and epifauna in the GOA, BS, and Arctic. (partially underway)

2. Develop a GIS relational database for habitat, including development of a historical time series of the spatial intensity of interactions between commercial fisheries and habitat. Such time series are needed to evaluate the impacts of changes in fishing effort and type on EFH. Assess the extent of the distribution of *Primnoa* corals and skate egg case concentration sites in the GOA, and conduct routine monitoring of these areas.

B.   Function of Habitat

1. Research is needed on the role of habitat in fish population dynamics, fish production (growth, reproduction), and ecosystem processes. Such research will improve the capability to identify and protect important habitats (including essential fish habitat and habitat areas of particular concern); help design effective habitat restoration efforts; improve the design and management of marine protected areas; improve fishery-independent population surveys; and improve stock assessments. Studies are needed to evaluate relationships between, and functional importance of, habitat-forming living substrates to juvenile and adult age classes of commercially important species and their preferred prey (forage fish). (partially ongoing)

2. Establish a scientific research and monitoring program to understand the degree to which impacts (habitat, benthic infauna, etc.) have been reduced within habitat closure areas, and to understand how benthic habitat recovery of key species is occurring. (This the objective of the EFH research approach for the Council FMPs).

IV.   Other Areas of Research Necessary for Management

A.   Ecosystem indicator development and maintenance.

1. Climatic indicators

a) Develop a multivariate index of the climate forcing of the Bering Sea shelf. Three biologically significant avenues for climate index predictions include advection, setup for primary production, and partitioning of habitat with oceanographic fronts and temperature preferences.
b) Develop bottom and water column temperature database for use in EBS, GOA, and AI stock assessments.
c) Maintain sea ice formation and retreat index for the EBS.

2. Lower trophic level community production data

a. Collect and maintain primary production time series in the EBS, AI, GOA, and Arctic; particularly in relationship to key climate and oceanographic variables.
b. Collect and maintain zooplankton biomass and community composition time series in the eastern Bering Sea. Develop, collect, and maintain time series of zooplankton biomass and community composition for the GOA, AI, and Arctic.
c. Collect and maintain data on forage fish community composition and abundance in the Bering Sea, GOA, AI, and Arctic.
d. Collect and maintain time-series data on the community composition, production and biomass of benthic invertebrate and vertebrate fauna.

3. Develop methods for incorporating ecosystem indicators into stock assessments and ecosystem assessments. Specifically:

a. Maintain indicator-based ecosystem assessment for EBS.
b. Develop indicator-based ecosystem assessments for AI (in progress), GOA, and Arctic.
c. Develop stock-specific ecosystem indicators and incorporate into stock assessments. (in progress)

4. Develop methodologies to monitor for new/emerging diseases among exploited species and higher trophic levels.

5. Assess the impact of increases in recovering whale populations (e.g. gray, humpback, and fin) on lower trophic level energy pathways.

6. Ecosystem indicator synthesis research.

7. Continue and expand cooperative research efforts to supplement existing at-sea surveys that provide seasonal, species-specific information on upper trophic levels (seabirds and marine mammals). Updated surveys to monitor distribution and abundance of seabirds and marine mammals are needed to assess impacts of fisheries on apex predators, improve the usefulness of apex predators as ecosystem indicators, and to improve ecosystem management.

8. Initiate and expand non-market valuation research of habitat, ecosystem services, and passive use considerations.

9. Assess the relative importance of non-commercially exploited species (invertebrates, fish, marine mammals, and seabirds) to human communities, particularly in Arctic.

B. Research on Environmental Influences on Ecosystem Processes

1. Climate variability: monitor and understand how changes in ocean conditions influence managed species.
   a) Maintain moorings. Development and maintenance of indices of the timing and extent of the spring bloom is a high priority. For this, maintenance of moorings, especially M-2, is essential. (underway)
   b) Monitor seasonal sea ice extent and thickness: If recent changes in ice cover and temperatures in the Bering Sea persist, these may have profound effects on marine communities.
   c) Measure and monitor fish composition: Evaluate existing data sets (bottom trawl surveys, acoustic trawl surveys, and BASIS surveys) to quantify changes in relative species composition of commercial and non-commercial species, identify and map assemblages, and monitor changes in the distribution of individual species and assemblages. Additional monitoring may be necessary in the Aleutian Islands, northern Bering Sea, and areas of the Gulf of Alaska.
   d) Assess the movement of fish to understand the spatial importance of predator-prey interactions in response to environmental variability.
2. Improve understanding of ocean acidification and its effects on managed species
   a) Collect and maintain time series of ocean pH in the major water masses off Alaska. (partially underway)
   b) Assess whether changes in pH would affect managed species, upper level predators, and lower trophic levels. (partially underway for some species)
3. Species' responses to multiple environmental stressors

a) Laboratory studies are needed to assess the synergistic effects of ocean acidification, oil, dispersants, and changes in temperature on productivity of marine species.

b) Monitor contaminant flux and loads in lower and higher trophic levels, and assess potential for impact on vital rates.

C.   Basic research on trophic interactions

1. Collect, analyze, and monitor diet information (species, biomass, energetics), from seasons in addition to summer, to assess spatial and temporal changes in predator-prey interactions, including marine mammals and seabirds. The diet information should be collected on the appropriate spatial scales for key predators and prey to determine how food webs may be changing in response to shifts in the range of crab and groundfish.

2. Ecosystem structure studies: Studies are needed on the implications of food web interactions of global warming, ocean acidification, and selective fishing. For instance, studies are needed to evaluate differential exploitation of some components of the ecosystem (e.g., Pacific cod, pollock, and crab) relative to others (e.g., arrowtooth flounder).

3. In the last decade, many whale populations (e.g., gray, humpback, and fin) have increased dramatically, after being depleted by whaling. These increases in abundance have the potential to alter lower trophic level energy pathways in the region. In addition, we should investigate potential impacts to other upper trophic level groups (i.e., pinnipeds, seabirds, large predatory fish).

D.   Ecosystem Modeling

1.   Modeling studies of ecosystem productivity in different regions (EBS, GOA and AI).

Enforcement Committee minutes

Birch Room, Hilton Hotel, Anchorage, AK
October 2, 2012 1-2pm

Committee: Roy Hyder (Chair), Asst Special Agent in Charge Ken Hansen, LT Anthony Kenne, Martin Loefflad, Glenn Merrill, Special Agent in Charge Sherrie Myers, Jon Streifel, Garland Walker, and Diana Evans (staff)

Others present included: Brad Robbins, Sarah Melton, Guy Holt

1. Transit around Round Island walrus protection area

At the June Council meeting, the Council initiated a regulatory amendment to address a problem, identified by the Enforcement Committee, related to enforcement concerns with existing regulations. Currently, vessels with Federal Fishing Permits are prohibited from transiting between 3 and 12 nm around Round Island and Cape Pierce. The Committee received a short update from Ken Hansen about his discussions on this issue with the US Fish and Wildlife Service (USFWS). Ken has recently received a letter from USFWS (attached) providing input that is relevant for the analysis, and **the Committee recommends that the letter be provided to Council staff for use in the preparation of the analysis.** Additionally, the USFWS provided a fact sheet with guidelines for marine vessel operations, for distribution to marine vessels that may be operating near Pacific walrus haulouts in Bristol Bay. The Committee recognizes that currently, there is confusion for the fleet about the enforcement of the existing regulations. This confusion will be alleviated with Council action on the regulatory amendment, and the Committee looks forward to the Council's review of the analysis.

2. VMS discussion paper

Diana Evans presented the VMS discussion paper that was authored by Jon McCracken. The Committee commended Jon on his paper, which provides valuable information on current and potential future uses for VMS in Alaska. If the Council chooses to continue exploration of this issue, the Committee provided some considerations to be included in a future iteration.

The Committee discussed whether there could be further evaluation of how having VMS on vessels would affect management, enforcement and compliance, or safety needs. Committee members noted that it may be possible to review previous search and rescue cases. There are additional factors that go into a successful search and rescue, which make it difficult to isolate and quantify the specific effect that having a VMS unit might play. However, an effort could be made to evaluate previous cases with a view to determining the size of the initial search area for vessels without VMS, and compare that to vessels with VMS. Quickly identifying the relevant search area is a critical element of a successful search and rescue effort, allowing for immediate deployment of assets, as well as the identification of potential Good Samaritan vessels that may be in the area.

Committee members also discussed that having VMS data substantially improves efficiency in both investigating and litigating enforcement violation cases, although it is difficult to quantify this improvement. For the IFQ fleets, which are largely the fleets that are not currently required to have VMS, the primary enforcement focus is to ensure that harvest occurs in lawful areas (as many of the EFH groundfish management closure areas do not apply to these fleets). Therefore, much of the evaluation of VMS data would be able to be automated or routinely conducted via landing records, and additionally, there tends to be an increase in compliance following VMS implementation.

1

The Committee also considered the discussion, in Section III, of the fleets that are not currently required to carry VMS. The Committee noted it would be helpful to see a further refinement of vessel counts by size in the four fleets, especially within the 30' to 60' LOA category. The Committee suggested that there are other relevant length class breakpoints that would be useful to evaluate within this category. For example, the length class for IFQ D class shares is 35' LOA, so it would be helpful to distinguish vessels above and below this threshold.

Additionally, the Committee suggested that it would be useful to have further analysis regarding the number of vessels in each fishery having landed fish from multiple regulatory areas, and those that have primarily landed fish from a single regulatory area.

The Committee noted that the title of the subsection in Section IV, "Alternatives to VMS", may be confusing, and the Committee recommends that the subsection instead simply refer to "Other available monitoring tools". For example, the discussion paper clearly explains that Automated Information System (AIS), while an electronic monitoring tool, is not a viable alternative to VMS for enforcement and management needs. AIS certainly has utility, especially for safety when transiting in congested traffic areas, and providing constant locational data when it is within reach of a receiver. VMS, however, provides complete coverage of all fishing grounds within the EEZ, and cannot lawfully be turned on or off.

Finally, the Committee notes that if the Council decides to move ahead with an analysis of this issue, the Committee would have suggestions about how to minimize the impacts of this requirement on the fleets. The Committee would be happy to further develop those suggestions at the appropriate time.

DRAFT REPORT
of the
SCIENTIFIC AND STATISTICAL COMMITTEE
to the
NORTH PACIFIC FISHERY MANAGEMENT COUNCIL
October1st – October 3rd, 2012

The SSC met from October 1st through October 3rd 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*	Sherri Dressel *Alaska Department of Fish and Game*
Anne Hollowed *NOAA Fisheries—AFSC*	George Hunt *University of Washington*	Gordon Kruse *University of Alaska Fairbanks*
Kathy Kuletz *US Fish and Wildlife Service*	Seth Macinko *University of Rhode Island*	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*	Ray Webster *International Pacific Halibut Commission*

B-1(b) Plan Team nominations

The SSC reviewed the Plan Team nominations of Dr. Christopher Siddon to the Bering Sea and Aleutian Islands Groundfish Plan Team, and Elisa Russ and Mark Stichert to the Gulf of Alaska Groundfish 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(c) Charter Halibut: Review Methodology for 2013 limits

Scott Meyer (ADFG) presented a discussion of preferred methods for projecting charter halibut yields in IPHC Areas 2A and 2C under several alternative management measures. Jane DiCosimo (NPFMC) provided context for the analysis by discussing the status of the proposed commercial/charter catch sharing plan for Pacific halibut, and the process by which the Council and the IPHC put charter halibut control measures into regulation. Gregg Williams (IPHC) outlined a potential change in setting CEYs for Pacific halibut to an approach that explicitly evaluates risks to the stock. Roland Maw (United Cook Inlet Drift Association), Bruce Gabrys (commercial fisherman), and Linda Behnken (Halibut Coalition) gave public testimony.

The analyst outlined a number of methods for projecting charter halibut harvest under different management restrictions, along with an approach to estimating discard mortality. The SSC supports the choice of projection methods given the uncertainty in future harvest due to the effects of management actions on charter behavior and due to changes in the underlying size distributions of the stock. These methods are appropriately conservative in tending to give projected estimates that are likely higher than the realized harvest.

The SSC recommends that consideration be given to getting records of the condition of discarded fish in

order to improve estimates of discard mortality rates. The SSC recognizes that, with variability among charter operators' practices and geographical differences in size distribution, it will be important to ensure that such data are representative of all discards. During discussion, the SSC noted that the greatest uncertainty in estimating total discard mortality is due to the lack of data on the size distribution of discarded halibut, which cannot be improved without measurement of discarded fish.

The SSC supports the examination of changes in the size distribution of halibut for subsets of IPHC setline survey stations in areas of the greatest charter harvest in order to help understand how changes in stock composition may affect projections of harvest.

The SSC recognizes that understanding human behavior is especially critical in anticipating the differential impacts associated with the form that charter halibut catch management may dictate. Charter halibut operations market an opportunity to realize *a priori* expectations. At present, our understanding of how prospective anglers' expectations are influenced by halibut retention regulations is largely based on anecdotal information. Because the form catch retention management takes (e.g., one-fish, reverse slot, maximum length) has the potential to profoundly affect economic demand for trips, an analysis of halibut charter demand should be a priority.

Regarding the time series forecasting models, the SSC suggested the use of AICc or similar criteria for model selection, and recommended that 95% confidence intervals be presented to convey forecast uncertainty. There may be bias in model selection when the mean squared difference is used as a basis for comparing the mean, moving average, exponential smoothing and double exponential smoothing models detection of trends in the series. This will also affect the modeling framework.

The analysis represents a time series analysis and could be cast in a general ARIMA modeling framework because the double exponential, single exponential, and mean smoothing of a data series are special cases of ARIMA(0,2,2), ARIMA (0,1,1), and ARIMA(0,0,0) processes.

Therefore, the analysis should consider using:
  i)   ACF, differencing (ARIMA(0,1,0)) and unit roots test (for stationarity and invertibility) to objectively identify whether there is a trend;
  ii)   AICc and BIC for the choice of statistical models (ARIMA(p,d,q));
  iii)   all available data to fit all possible models instead of dropping the first 6 points. This can help to lower the uncertainty of the predicted values. The exponential smoothing model only requires one starting point instead of six points.

The first order differencing ARIMA(0,1,0) is a powerful tool to identify the trend and allows the model to satisfy both the stationarity and invertibility criteria. It is not likely that the second order differencing (ARIMA(0,2,0)) will be needed.

C-2(a) Groundfish Plan Team reports
The SSC received presentations from Grant Thompson (NMFS-AFSC) and Diana Stram (NPFMC) on a number of recommendations from the BSAI and GOA Plan teams. For the most part, the SSC supports the GPT recommendations, but also had comments and additional recommendations on some of the items presented that are provided below.

Retrospective Analysis
A retrospective pattern is a systematic inconsistency among a series of estimates of the population size, or related assessment variables, based on increasing periods of data. A retrospective pattern is an indication something is inconsistent (data and/or model). The SSC concurs with the working group and the

Groundfish Plan Team (GPT) recommendation that for Alaska groundfish assessment with Tiers 1-3 age-structured models, a retrospective analysis should be done as part of the model evaluation.

The authors have provided three examples with possible biological explanations in the report. Choice among possible explanations can improve the relationship between data and the proposed model, and model forecasting. They can also consider using possible statistical explanation(s) to understand and improve the proposed model from the retrospective pattern of the estimated spawning biomass series. These include:

i) adding one unknown parameter when there is a sudden jump in the sequential retrospective pattern;

ii) robustness of the estimated virgin spawning biomass;

iii) the relationship between the estimated virgin spawning biomass and the availability of data in the proposed model; and/or

iv) whether the input parameter(s) has/have reasonable value(s).

It may help the GPT to adapt or abandon the use of estimated B0 and/or B_{MSY}. The estimated spawning biomass is not a direct estimate from the model output. It varies with the proposed model and is a byproduct of several estimates from the model output. So, it is a challenge to provide explanation whether it is caused by data and/or the proposed model. The authors can investigate the retrospective pattern of the estimated recruitment because it is a direct estimate from the model and can be compared directly with the observed catch data.

Methods for Survey Averaging

There are at least three reasons for wanting to average survey abundance or biomass over time: (a) to obtain a good estimate of biomass for use in Tier 5 calculations, (b) to apportion biomass to subareas, and (c) to interpolate between survey data points. The appropriate method for each reason could be different. The Joint Groundfish Plan Team discussed Kalman filter (KF) and random effects (RE) models as alternatives to unweighted or weighted averaging techniques, which have been used for the most part in groundfish stock assessments.

Equations should be included for the Kalman filter (KF) and random effects (RE) models. The equations can help reviewers to identify the structure of errors in observation and state equations. In addition, the use of KF approach can model process errors, measurement errors and random effects in one likelihood that is free of high dimensional integrals. The weakness of the KF approach is that the KF estimates are somewhat different than maximum likelihood estimates. In addition, identification of over-parameterization in the KF approach is very difficult. So, the authors should check whether they have sufficient replicates and data for their proposed model. The RE models usually help the authors to understand the correlation of two random effects and its prediction ability is the same as the fixed effects models. The Discussion section of the report could be strengthened to include observations such as that bias will increase with increasing weight given to past observations when there is a trend in the data, and this is a particularly undesirable property of the equal-weighting methods. Precision, on the other hand, will generally improve as more data are included, and this is the goal of using more than the most recent survey results. The Kalman filter essentially balances these by accounting for both within-survey and between-survey variability, leading to estimates which are both more precise than using a single survey, but generally have relatively little bias compared to more naive weighting methods. Including this kind of text in the discussion will help provide stronger motivation for changing to a KF type weighting scheme for a range of species, without being completely dependent on a very specific simulation study.

Regarding the tables of simulation results, the final rows of each table contain averages over all previous rows. These rows do not generally provide a meaningful comparison of the methods and should be removed. For example, a weighting scheme that is strongly negatively biased when the trend is positive but positively biased when the trend is downwards will not seem so bad when biases are averaged over both types of trend.

The SSC concurs with the Team that stock assessment authors for Tier 5 stocks should continue to use status quo methods for survey averaging, and that they should also calculate alternate RE estimates, so that experience can be gained over time in how similar or different the estimates are from the two approaches.

BSAI and GOA Pacific cod models

Grant Thompson (NMFS-AFSC) and Diana Stram (NPFMC) presented Plan Team recommendations for models that will go forward for consideration at the November Plan Team meeting. These models are based on proposals by the senior assessment author(s), the Plan Teams, the SSC, and the public following the process established in recent years. For the BS Pacific cod stock, the Plan Team recommends including the currently accepted model (Model 1) and Model 5 because it is parsimonious and includes a number of features that improve fit to the data. The Plan Team recommended the author bring forward a version of Model 5 that incorporates time varying selectivity for the fishery, if time permits and is worthwhile. The SSC supports Plan Team recommendations and encourages the author - if time permits - to bring forward a model that considers time varying survey Q to see if that produces better fit to the survey data. The SSC also agrees with the Plan Team request for the author to bring forward Models 1.1 and 4 to provide a check on the candidate models. In response to a previous SSC request, the author completely re-parameterized the inter- and intra-annual weight-length relationship in a way that follows an explicit phenological process and is biologically reasonable. This change is incorporated in Model 5. The SSC believes this provides a significant improvement in the fit to the data that should be carried forward in Model 5. The approach could also serve as a model for other assessments.

The Plan Team reviewed two models for Aleutian Island Pacific cod. Model 1 was based on the EBS model, but with only one season. Model 2 was like Model 1 but included time-varying growth. These models illustrated that there is an obvious trade-off between modeling growth and recruitment. The Plan Team recommends that the two models presented in the preliminary assessment be updated with the most recent data and be brought forward for presentation at the November Plan Team meeting so as to continue progress on development of this assessment. The SSC agrees with Plan Team recommendations and looks forward to further development of the Aleutian Island model. The author mentioned that he has requested ageing of historical samples and intends to incorporate these into further assessments. Also, the development of an empirical growth relationship outside of the assessment model would be informative. **When the SSC judges this assessment as appropriate for setting management benchmarks, it will be used to set separate OFL and ABC for the Aleutian Island Pacific cod stock. This could happen as soon as the next assessment cycle (2014 fishing season).**

The Plan Team reviewed a suite of GOA Pacific cod models that centered on SSC, Plan Team and public comments and recommendations. The Plan Team recommended that the base model used last year be brought forward for consideration in November and that the authors explore models that consider fixed Q, drop the sub 27 size category, drop the mean length-at-age data and authors' preferred model. The SSC agrees with Plan Team recommendations and looks forward to future model developments and a more thorough documentation of the recent model improvements.

Kamchatka Flounder Model

Kamchatka flounder are currently 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.

Kamchatka flounder have been distinguished from arrowtooth flounder in the survey since about 1991 or 1992 and in the fishery since 2007. Arrowtooth and Kamchatka flounder have been managed separately since 2011 because a directed fishery emerged for Kamchatka flounder in 2010.

The analysts developed a provisional sex-specific length-based assessment model that also estimates numbers at age with a length-age matrix. Inputs include catches from the EBS shelf and slope surveys and Aleutian Islands survey. Species-specific commercial catches are available only since 2007. Over the period of 1991 to 2006, it is assumed that Kamchatka flounder constituted 10% of the catch comprised of Kamchatka flounder, arrowtooth flounder, and Greenland turbot.

The Plan Team recommended additional sensitivity analyses of alternative values of M, further development of the age-structured model to be reported in September 2013, and inclusion of an alternative Tier 5 analysis using M=0.13. The SSC appreciates the efforts of the analysts to develop this initial assessment for this species and supports the Plan Team's requests of the analysts. In addition to those, the SSC adds the following requests:

1. Report on what is known (or assumed) about stock structure. The assumption seems to be that Kamchatka flounder from the EBS and Aleutian Islands represent one stock. Are there any data at all that can be brought to bear on stock structure? For instance, do length/age frequency distributions from the Aleutians and EBS suggest synchrony in year classes?

2. Evaluate the sensitivity of the assessment to the assumption that Kamchatka flounder of a fixed sex ratio constituted 10% of the catch of arrowtooth flounder and Greenland turbot over 1991-2006. Also, the assessment reports that Kamchatka flounder have been consistently identified in trawl surveys starting in 1991 (executive summary) or 1992 (introduction). Does the start year of the time series affect the resulting assessment?

3. Report on the sex ratio of the commercial and survey catches, as well as the estimated population.

4. The weight-length relationships shown in the upper and lower panels of Fig. 7-6 appear to be identical. One of the two must be in error.

5. Consider whether any other methods (e.g., Alverson and Carney, Jensen) are available to generate alternative estimates of M. Also, consider whether there is evidence for different estimates of M for males and females. Is there evidence of sex-specific M's for closely related species?

6. Report whether data are available to examine potential changes in growth over time. Given the similarity in diets among Kamchatka and arrowtooth flounder and the increase in arrowtooth flounder biomass, there may be potential for changes in growth of Kamchatka flounder over time. If the reported size at age data for the Aleutian Islands in 2010 represents the only such data available, then such an analysis is not possible at this time.

7. In Fig. 7-5, consider truncating the x-axes so that the length-frequency histograms are spread out and easier to examine for year-to-year modal progressions.

8. The analysis assumes dome-shaped selectivity for the shelf survey and asymptotic selectivity for the slope and Aleutian Islands survey. Some justification is provided. Consider evaluating the sensitivity of the assessment to these assumptions.

9. Report what weightings were used for the three surveys. Confidence intervals appear to be tighter for the shelf survey compared to the slope and Aleutian Islands survey. Consider evaluating the sensitivity of the assessment to alternative weighting of the three survey time series. Also, the model appears to overestimate periods of low shelf survey biomass and underestimate periods of high shelf survey biomass (Fig. 7-16). Why? Are there potential model mis-specifications? Would this residual pattern be addressed with higher M estimates?

10. What is the justification for the sharp drop in full-selection F from 2009 to 2011? This appears to be counterintuitive, given that this is the time period corresponding to development of the targeted Kamchatka flounder fishery.
11. Explain the years that are represented in the averages shown in Fig. 7-18 in the associated figure caption.
12. Consider including tables of resultant population estimates (numbers or biomass) at age and time series of estimated recruitment.
13. Present and discuss model fit diagnostics (e.g., residuals) and discuss the model's ability to replicate the various input data series.

To the extent possible, the SSC recommends that the author address some of the more minor issues above in time for the November/December 2012 assessment cycle. Otherwise, the SSC looks forward to further model development to address the other more substantial issues in the next assessment cycle.

Greenland Turbot update
There were major changes made to this assessment, so it is being vetted to the Plan Team and SSC per standard operating procedure. The SSC supports the recommendations of the Plan Team. In their description of the models with varying SigmaR, the authors use the word "parsimonious" when they appear to mean "best fitting" or something similar, and we request the authors correct this to avoid confusion over the nature of the models being fitted.

BSAI Skates
There were major changes made to this assessment, so it is being vetted to the Plan Team and SSC per standard operating procedure. The author used the updated version 3 of Stock Synthesis, and a Schnute growth curve rather than a von Bertalanffy. Fishery and survey selectivities are allowed to be dome-shaped, and a new density-dependent survivorship function developed by Mark Maunder is used. The oldest age is increased from 25 to 30, and only the most recent year of length-at-age data is used.

These changes result in modest increases in biomass, fishing mortality, ABC, and OFL. The Plan Team approved of the changes to the assessment and recommended that three models be developed for November/ December: the model with last year's configuration, the revised model, and an extension of the new model, in which growth parameters are estimated internally in the model. The Plan Team also recommended that the author try lowering the starting size of the plus group to 110 cm. The SSC concurs with these recommendations but also recommends an additional model with all three length-at-age datasets be considered for November/ December.

C-2(b) Groundfish Catch Specifications
The SSC received a presentation from Grant Thompson (NMFS-AFSC) and Diana Stram (NPFMC) on the proposed harvest specifications for groundfish in both the BSAI and the GOA for 2013 and 2014. The SSC recommends approval of these specifications.

C-3 Observer Program
A presentation was given by Craig Faunce (NMFS-AFSC) on the NMFS Annual Deployment Plan (ADP) for the North Pacific Groundfish Observer Program in 2013. Public testimony was provided by Rachel Dunkersloot (Alaska Marine Conservation Council), Paul Olson (The Boat Company), Dan Falvey (Alaska Longline Fishermen's Association), and Jon Warrenchuk (Oceana).

The SSC appreciates the extensive work done to finalize the ADP that provides details on the rationale for the rate of observing to contain program costs, and mechanics of observing catches at sea and dockside sampling for groundfish fisheries in Gulf of Alaska and Bering Sea/Aleutian Islands. While the ADP is

not a regulatory document, the SSC was asked to provide comments on adequacy of the sampling design to achieve the multiple goals of the observer program. We primarily focused our comments on methods and rates of observing the partially-observed strata (trip selection for vessels >57.5' and vessel selection for vessels 40 to 57.5') in the ADP since very few changes were made to the 100% observed vessels. Our general comments on the sampling design are:

- **The new sampling design for partially-observed vessel types is a significant improvement over the current sampling design in that a single rate (13%) is applied to all strata and the selection of either vessels or trips is completely randomized to avoid the observer effect thought to exist in the current deployment plan. This will greatly increase the likelihood that statistics derived from observed trips are unbiased with respect to the unobserved trips.**
- The sampling design and rate for 2013 represents an initial effort to deploy a completely randomized design with equal coverage across all partially-observed vessels greater than 40 feet in length. It is likely that this initial effort will not be optimal with respect to management needs and cost-benefit. We envision that once these data are collected and analyzed, revisions to the design and overall ADP will be forthcoming to attempt to optimize the deployment of observers to meet Council management objectives and priorities, and deliver the highest precision possible per dollar spent on the observing program.
- We also recognize that efforts to optimize the sampling design in the future will require that a set of performance measures be developed to guide improvements in the face of multiple and complex management objectives. Performance indicators will need to specify target levels, control levels, and frequency of evaluation.
- Responses to logistical concerns in deploying observers will also have to evolve over time as newly observed fleets respond to implementation of the 2013 ADP.
- As the ADP evolves in future years, we anticipate that sampling rates in each stratum, duration of observing needed in the trip-selection stratum, and the use of Electronic Monitoring devices will all change as a result of information acquired from the new sampling design.

The SSC also had the following specific technical suggestions on development of the ADP in the future:
- Review the randomization method in the sampling protocols to assess whether there is possible bias, correlation and autocorrelation among sampling points or data.
- Provide rationale for the statement "The rate of sampling will be iteratively adjusted until a set of C values is achieved such that 90% of them were at or below the $4.2M amount that equates to 2013 start-up funds." In addition, the authors should rerun the simulation with replicates to get the variance of the sampling rate.
- Consider use of balanced sampling in order to improve the efficiency of the sampling design with limited sampling effort.
- Consider use of balanced bootstrapping or simulation techniques in the simulation, and/or derive the parametric distribution analytically. This can help to review and check the simulation results for bias.
- Set and record the seed in the simulation as it can help potential reviewers to repeat and verify the simulation results.

C-4(b) Steller Sea Lion EIS analytical approach
Chapter 8 – RIR methods
Dr. Ben Muse (NMFS-AKR) presented the analytical framework that will be used in the RIR for the Steller Sea Lion Protection Measures EIS. Public testimony was provided by David Fraser (Adak Community Development Corp.).

The SSC was asked to focus on methodological considerations, emphasizing their relevance, appropriateness, and adequacy to carry-out the mandatory economic and socioeconomic impacts, including distribution considerations associated with the SSL EIS.

The presentation was excellent and very informative. **In general, the SSC believes that the methodology is sound, well established, and reasonable.** When these economic analytical protocols are applied to the biological, ecological, and administrative attributes associated with the action, the SSC believes one can anticipate a meaningful, informative, and technically sufficient RIR/IRFA.

There are a few elements of the RIR that should be modified or clarified. The document would benefit from more information on how cost items were allocated into fixed vs. variable costs in Table 8.20. In particular, maintenance is assumed to be split evenly between the two, but the basis for the assumption is not stated.

As the document evolves, it is important for the authors to clearly and accurately portray how the cost information should be used. The RIR estimates that variable costs are roughly 51-57% of gross revenue. It appears that this ratio is assumed to be constant across all the alternatives. If so, then the use of variable costs will shed absolutely no additional information in comparing alternatives than is already provided by gross revenue estimates. This is because all revenue estimates will be adjusted by the same, constant amount, and therefore, the relative impacts of the alternatives in terms of both ranking and ratios will be identical for gross revenue and net revenue estimates. Although the use of net revenue estimates will not be useful for evaluating alternatives, they will give a rough estimate of the financial impacts on the impacted fisheries. In the future, the SSC hopes that a framework will be developed that will allow for a more robust use of cost information, including relaxing the assumption that alternatives may impact revenue, but will have no impact on the variable cost ratio.

The document includes a discussion of the contingent valuation estimates of the willingness-to-pay (WTP) for changes in sea lion populations. In the background section (8.2.11), the document provides estimates for the WTP for 1% and 2% increases in sea lion populations. Given that the RPA does not predict an increase in populations, the RIR needs to justify the basis upon which it is deriving benefit estimates based on a 1-2% increase. If the purpose is to provide a rough sense of the order of magnitude of the benefits, then this should be made clear.

The discussion of fishery taxes (section 8.2.12) seems to include all taxes in the communities, not just those taxes received from the potentially impacted fisheries. To facilitate a more accurate assessment of the potential impacts to the communities, it would be helpful if the discussion is clear about the share of tax revenues that could be affected. To the extent possible, the accompanying tables should separate out tax revenues from the potentially impacted fisheries.

One pertinent consideration offered in public comment warrants additional evaluation. Because of the unique status of the community of Adak, provided under several Congressional mandates and Council actions, the suggestion was made that the period following the 2000 SSL BiOp is not reliable or reflective of the community-based fishing effort, targeting patterns, and catch deliveries characteristic of Adak-adjacent areas. The SSC suggests that the analysts consider inclusion of pre-2000 fishing data in their baseline description.

The SSC endorses the proposed methodological approach for performance of the SSL EIS Chapter 8 RIR/IRFA.

Chapter 10 – Community Impacts

Presentations were provided by Ben Muse (NMFS-AKR) and Mike Downs (AECOM). There was no public testimony.

This is a preliminary draft of the Community Impacts chapter for the SSL Protection Measures EIS in which the SSC is asked to comment on the methodology to inform revisions and completion of the remainder of the EIS. As the authors noted, some sections are more complete than others owing to the short time between contracting the work and the deadline for this initial review draft. The SSC commends the authors on the volume and high quality of data and analysis that was rapidly assembled for this initial review, acknowledging that there are still many incomplete sections.

The SSC noted that contracting the compilation and analyses of existing data to inform an action may not capture the changing nature of communities and their evolving capacities to respond to policy changes, and suggests contracting new data collection efforts when community impact analyses are needed. Fieldwork, especially in Adak, would strengthen sections where there may be no available data, but the SSC understands that this will likely not be performed for this analysis because of budget and time concerns. Given these constraints, phone calls to communities and stakeholders are reasonable substitutes. For future studies, the SSC recommend that resources be directed to support fieldwork in communities.

With reference to the Principal Components Analysis, in which a ranking of community engagement was performed, the SSC notes that the eight variables are subjective, and changing any of these variables could change the ranking. Variables to consider are proximity to the fishery, community dependency on the fishery, among many possibilities. If the current variables are retained, a rationale for selecting these should be provided.

Given the village of Atka's status as the top subsistence harvester of Steller sea lions in the State, and their new capacity for processing Pacific cod, this community should be included more directly in the analysis. It was also noted that it is likely that subsistence harvesting in Adak is more frequent than is acknowledged in the document.

It was noted that, in a few places, the presentation of statistics can dramatically alter the characterization of a situation. For example, it would be more telling for community impacts to express Adak's vessel engagement in the Pacific cod fishery in the AI subarea as a proportion of Adak's fleet, not as a proportion of the total fixed gear catcher vessels fishing the area (p. 50). If there is a single vessel participating, it still amounts to 50% of Adak's fleet (p. 31). Statistical descriptions should be carefully evaluated for their portrayal of community impacts.

C-5(b) AFA Vessel Replacement GOA Sideboards

The SSC received a presentation of the draft analysis from Mark Fina (NPFMC). Public testimony was provided by Brent Paine (United Catcher Boats).

This document presents a clear identification of the suite of alternatives under consideration by the Council to address the structural change made in the original AFA, by implementation of the Coast Guard Act (CGA). The document lays out the elemental components that differ among the no action alternative, the 'status quo' alternative (that differs from no action here), and several options for treating the ambiguities that emerge from imprecise or incomplete articulation of AFA modifications in the CGA.

The draft also does a nice job statistically documenting the historical participation, catch, gross revenues, product outputs and forms, etc., from the BS and GOA fisheries that have been prosecuted by vessels that may be affected by this action. The descriptive content is robust.

Armed with a clear articulation of the problem, detailed treatment of the competing alternatives and their differences, and the empirical data just mentioned, the next step in this RIR/IRFA should be an "analysis of expected economic, socioeconomic, and distributional outcomes" of each action alternative, compared to the baseline. This last critical step hasn't been initiated in this draft. Questions that need to be addressed include: What purpose did AFA have in prohibiting vessel replacement except in extreme cases of loss? What costs have emerged from these constraints? Have there been benefits to the fisheries, communities, participants from this limitation? What purpose did the CGA have in modifying these restrictive rules? What costs did the authors see in the original limitations and how would the liberalization affect the economic performance (in all its relevant dimensions) in AFA fishery and those other groundfish target fisheries in the GOA and BSAI, with or without sideboards and exemptions? Do economic and operational incentives exist (or can they be anticipated) that will result in exercising these liberalized replacement rules? What role may cooperative fishery management structures play in the patterns of replacement, effort distribution, monitoring complexities and burdens, etc., under these action alternatives?

Each alternative must be assessed to the fullest extent practicable, recognizing the limitations on some forms of critical data. Who are the winners and losers? What forms will economic and socioeconomic changes in response to each alternative likely take? Are there employment impacts? Will consumers realize changes in price, quality, supply? Are there spill-over effects that may result in benefits, costs, distributional changes, management costs or complexities? What might one conclude about the net national benefit of each alternative action? How are impacts distributed across entities, by size category?

Not every one of these topics will have a nexus to the choice set under consideration, but the analysis has an obligation to raise the question. This has not been sufficiently attempted in this early draft. The opportunity to meet these obligations **before release** for public review should be exercised. **The SSC recommends not releasing this draft for public review.**

C-6(a) BSAI Crab ROFR

The SSC received a presentation of the draft analysis from Dr. Mark Fina (NPFMC). Public testimony was received from Steve Minor (North Pacific Crab Association) and Frank Kelty (City of Unalaska).

The SSC recommends that the analysis be released for public review following revisions to address comments made below.

The SSC commends the analyst for the work performed on what is a challenging assignment. This is, however, a difficult document to read and the SSC is concerned about its "accessibility" to a general audience. This concern is not a reflection on the author, but rather, the convoluted nature of the document is a direct result of the choices made by the Council in trying to safeguard communities from the particular program it designed for the crab fisheries in the BSAI. The SSC urges the author to try to make explanations of the Council's menu of options as easily comprehensible as possible.

The contemplated actions inevitably involve a clash of interests between those vested with processing quota shares via the crab program designed by the Council and communities that the Council is also concerned about. Care should be taken in the choice of language used to describe tradeoffs to avoid a vocabulary that appears to favor one set of interests over another (e.g., "interfere," "impinge," "disrupt").

It appears that there is considerable variation in the level of transparency involved in the relationship between "entities" (created under the ROFR provision) and the actual communities of concern. The analysis would benefit from additional information about the nature of the relationship between the communities of concern and the entities that represent them in terms of the ROFR provision.

Statements in the document regarding the likely impact on net benefits to the nation and distributional zero sum games between communities need to be more carefully qualified. If society values the existence of isolated communities featuring single processing operations, then it is not clear that the transfer of PQS to larger, more diverse communities is a mere distributional issue. If on the other hand, none of the ROFR options under consideration can prevent such a transfer, then the current assessment of effects on net benefits may be more plausible. The document should be revised to treat the discussion of inter-community tradeoffs with more care and to appropriately qualify the statement about effects on net benefits.

C-6(b) BSAI Crab active participation requirements
The SSC received a presentation of the draft RIR/IRFA from Dr. Mark Fina (NPFMC). Public testimony was provided by Mark Gleason (Alaska Bering Sea Crabbers), by Joe Sullivan (Intercooperative Exchange), and Edward Paulson (representing self).

Based upon the presentation by Dr. Fina and the SSC's reading of the initial draft document, it is apparent that key policy and design questions, necessary to proceed to a complete and informed analytical package, have not been adequately articulated by the Council. The analyst systematically enumerates each of these missing components, providing a clear list of each decision point, and requests specific Council guidance. At present, the draft is fragmented, incomplete, and deficient. Further progress on this action is dependent on the Council providing direction on its expectations for the management action.

Assuming the Council chooses to proceed with a revised Active Participation action, the SSC did identify several specific concerns with the analytical content of the current draft that may be relevant. There are several specific arguments made in the draft that should be clarified or reconsidered in any subsequent draft. On page 16, for example, under Price Effects, the assertion is made that *"Shares are likely to trade at a free market price ..."* and further that price effects are likely to be small. This may be true, but it is important to note that any time one imposes a constraint on the pool of eligible buyers, the price will decrease, all else equal. The QS market is substantially constrained.

The discussion of the influence of CDQ groups on demand and price in this market further confounds the 'free market price' assertion. The analysis observes that CDQ groups "... may be willing to pay premium prices (for crab QS)." Given CDQ groups enjoy market-distorting advantages (e.g., subsidized allocations, small entity status), their presence in this market has a substantial potential to influence demand and, thus, market prices. In such an economic environment, one would not expect the "predicted" free market price outcome. A more nuanced discussion of the market for shares is recommended.

On another point, while the general intent of the <u>action</u> alternative seems reasonably clear (i.e., to facilitate transfer of owner-QS to active participants), there is a question as to why the Council would wish to constrain "permanent transfers" (implicitly) on the seller's side of the transaction. It would appear that if a non-participating QS owner wished to divest his/her/its holdings, that would be in full accord with the purpose of the action and should not be impinged. At present, the action alternative imposes a limit on the seller. However, if the SSC correctly interprets Council intent, the alternative could be modified to say, *"To be eligible to permanently <u>acquire</u> and retain..."*, the reasoning would be clear and the action would better comport with the action objectives.

In the top section of page 23 of the draft, the text expresses concern that excessively high "landings thresholds" (i.e., active participation levels) could disadvantage crewmembers seeking to acquire QS, despite their consistent participation in the fishery in question. The analysis gives as an example crew aboard vessels that are consistently active, but catch relatively small amounts of crab during the season.

This can result in the risk of failure to consistently, year-in-year-out, meet catch threshold requirements. The SSC notes two matters requiring further examination. The first is to examine whether setting the landings minimum threshold, as proposed, accomplishes the outcome the Council wishes for the program. The analyst must look to the Council for guidance.

The second consideration is perhaps less evident, at least in the SSC's reading of the analysis. It is not clear from the draft how QS, owned by a crewmember that is annually on the knife's edge of qualification as 'active', would be managed? That is, once owner-QS is acquired, what provisions exist for suspension or revocation (of attributable IFQ) if, in years subsequent to the acquisition, the minimum threshold is not met?

The administrative mechanism needed to implement such a program is not presented (e.g., an administrative appeal process, disposition of withheld IFQ, season harvest impacts) and attributable cost, funding source, distribution affects are undefined.

While the kernel of the management action is clearly presented by the Council in its Purpose and Need statement, the analysis may require further Council guidance to determine if this is the optimal way to meet the objective.

The SSC recommends that the draft not be released at this time. Further development of the action must await guidance from the Council. The SSC would welcome the opportunity to review a revised document, should the Council choose to proceed with this action.

C-6(g) Crab SAFE

Diana Stram (NPFMC) and Bob Foy (NMFS-AFSC, CPT Chair) presented the Crab Plan Team report and sections of the Crab SAFE. The SSC reviewed the SAFE chapters and information provided by the Plan Team with respect to the stock status information from 2011/2012 relative to total catch in that time period (Table 1). The SSC notes that no stock was subject to overfishing in 2011/2012. In addition, Table 2 contains the SSC recommendations for 2012/2013 for stocks.

The Crab Plan Team requested clarification from the SSC on the general utility of the maxABC control rule. The SSC agrees that applying a 10% buffer to set ABC below OFL remains appropriate until parameter and model uncertainty can be more appropriately quantified, which will probably require a broader discussion of structural uncertainties across both crab and groundfish assessments. The SSC recommends that a workgroup of some CPT and SSC members be established to revisit this issue.

Table 1. Information for overfishing determination for BSAI crab stocks for 2011/12. Values are in thousand metric tons (kt).

Chapter	Stock	2011/12 OFL	2011/12 ABC	2011/12 Total catch
1	EBS snow crab	73.5	66.15	44.7
2	BB red king crab	8.80	7.92	4.09
3	EBS Tanner crab	2.75	2.48	1.24
4	Pribilof Islands red king crab	0.393	0.307	0.005
5	Pribilof Islands blue king crab	0.00116	0.00104	0.0004
6	St. Matthew Island blue king crab	1.70 [total male catch]	1.5 [total male catch]	0.95 [total male catch]
7	Norton Sound red king crab	0.30	0.27	0.20
8	AI golden king crab	5.17	4.66	2.95
9	Pribilof Islands golden king crab	0.09	0.08	Conf.
10	Adak red king crab	0.05	0.014	0.02

10/4/2012

Table 2. SSC recommendations for 2012/2013 (stocks 1-6). Note that recommendations for stocks 7-10 represent those final values recommended by the SSC in June 2012. Bold indicates where SSC recommendations differ from Crab Plan Team recommendations. Note diagonal fill indicated parameters not applicable for that tier level. Values in thousand metric tons (kt).

Chapter	Stock	Tier	Status (a,b,c)	F_{OFL}	B_{MSY} or $B_{MSYproxy}$	Years[1] (biomass or catch)	2012/13[2] [3]MMB	2012 MMB / MMB$_{MSY}$	γ	Mortality (M)	2012/13 OFL	2012/13 ABC
1	EBS snow crab	3	b	1.42	154.7	1979-current [recruitment]	146.3	0.95		0.23(females) 0.329 (imm) 0.273 (mat males)	67.8	61.02
2	BB red king crab	3	b	0.31	27.5	1984-current [recruitment]	26.32	0.96		0.18 default Estimated[4]	7.96	7.17
3	EBS Tanner crab	3	a	0.61	33.45	1982-current [recruitment]	42.74	**1.28**		0.337 (females), 0.252 (mat males), 0.249 (imm males and females)	**19.00**	8.17
4	Pribilof Islands red king crab	4	b	0.11	5.14	1991-current	3.30	0.64	1.0	0.18	0.60	0.46
5	Pribilof Islands blue king crab	4	c	0	3.94	1980-1984 1990-1997	0.50	0.13	1.0	0.18	0.00116	0.00104
6	St. Matthew Island blue king crab	4	a	0.18	3.56	1978-current	5.63	1.58	1.0	0.18	1.02 [total male catch]	0.92 [total male catch]
7	Norton Sound red king crab	4	a	0.18	1.59	1980-current [model estimate]	1.93	1.2	1.0	0.18 0.68 (>123 mm)	0.24	0.22
8	AI golden king crab	5			See intro chapter						5.69	5.12
9	Pribilof Island golden king crab	5			See intro chapter						0.09	0.08
10	Adak red king crab	5				1995/96–2007/08					0.05	0.03

[1] For Tiers 3 and 4 where B_{MSY} or $B_{MSYproxy}$ is estimable, the years refer to the time period over which the estimate is made. For Tier 5 stocks it is the years upon which the catch average for OFL is obtained.

[2] MMB as projected for 2/15/2013 at time of mating.

[3] Model mature biomass on 7/1/2012

[4] Additional mortality males two periods: 1980-1985; 1968-1979 and 1986-2008. Females three periods: 1980-1984; 1976-1979; 1985-1993 and 1968-1975; 1994-2008. See assessment mortality rates associated with these time periods.

Snow Crab

After extensive model development over the past few years, two models were brought forward in this assessment. This year's base model was Model 6 from the September 2011 assessment. Some of the basic features of the current base model are: (1) annual recruitment deviations are estimated and distributed among size classes assuming gamma distribution with equal recruitment assumed for males and females, (2) mean width after molting is estimated as a linear function of pre-molt width with priors from limited growth data and post-molt lengths are distributed among size bins assuming a gamma distribution, (3) mature female mortality is fixed at $M = 0.23$, male M and immature M are estimated in the model with priors $M=0.23$ and $se(M) = 0.054$, (4) the probability of new shell crab maturing is estimated as a smooth function in the model to match the observed fraction mature by size, and (5) survey selectivity for the BSFRF and NMFS data in the study area are estimated separately for males and females within the model.

In addition to the base model, a second model was explored that implements a quadratic relationship between pre-molt and post-molt size. Priors for the parameters of the relationship were estimated by D. Somerton based on recent molting experiments.

The SSC agrees with the CPT recommendation to adopt the current base model for specification purposes for 2012/13. Results from the assessment place the EBS snow crab stock in Tier 3a, given that mature male biomass at mating in 2011/12 was estimated at 107% of the proxy for B_{MSY} ($B_{35\%}$). The SSC concurs with the author and CPT recommendations that the ABC be less than maximum permissible given the structural uncertainty of this model and to use a 10% buffer for setting ABC. This results in a OFL for 2012/13 - as determined by the $F_{35\%}$ control rule - of 67.8 kt (149.5 million lb) and an ABC of 61.0 kt (134.5 million lb).

The SSC has the following recommendations for the author:
- The SSC agrees with CPT recommendations to more fully and directly integrate results from recent growth-increment studies into the assessment. There was considerable improvement in the model in terms of the likelihood by adding two additional growth parameters with large consequences for our view of stock status. **Hence, the growth parameterization should be a high-priority area for further exploration.**
- The authors may want to update their introduction to note that snow crab not only occur in the western North Atlantic are now permanently established on the eastern side of the Atlantic in the Barents Sea (J. Alvsvåg, A.-L. Agnalt and K. E. Jørstad (2009). Evidence for a permanent establishment of the snow crab (*Chionoecetes opilio*) in the Barents Sea. Biological Invasions 3: 587-595. DOI: 10.1007/s10530-008-9273-7)
- The values in Table 13 need to be clarified. While values are described as "likelihood" in the header, they appear to be log-likelihood values. This is somewhat confusing because assessments typically report the actual objective function values, i.e. the negative log-likelihood.
- A number of figures need axis scales and/or axis labels (e.g., Figs 80, 82, 83, 98, 99 & 100) and an explanation of abbreviations (Fig. 99,100).
- To address ongoing concerns over disproportionate harvesting on the southern portion of the stock, the SSC recommends that the authors work through the stock structure worksheet for snow crab.

Bristol Bay Red King Crab

This fall, the authors conducted a straightforward update of the preferred Model 7ac that was selected by the Plan Teams and the SSC this spring.

This year's SAFE addressed some but not all of the SSC comments from previous years. In October 2011 the SSC requested that the author include two new options in 2012: (1) an option with no additional M periods and (2) an option without additional M periods and an additional survey selectivity period in the early 1980s. Because no additional modeling work was done for Bristol Bay red king crab in May 2012, the authors indicated that they would address SSC model requests in May 2013.

In October 2011, the SSC noted that the preferred Model 7ac applied higher M for the period 1980 through 1984 for males, and 1980 through 1984, 1976 through 1979 and 1985 through 1993 for females, and requested additional justification for selecting these additional natural mortality periods. In Appendix 1 of this year's SAFE, the authors described four potential factors for high mortality during the early 1980s. The authors concluded that combinations of fish mortality, natural mortality, disease, and predation may have contributed to the decline. **The SSC appreciates this information, however, Appendix 1 does not specifically address why natural mortality was higher during the specific years identified in the model other than to note that "the model fit the data much better with these three parameters than without them." Is there any corroborating evidence for these particular time periods?**

In October 2011, the SSC requested that the authors review the re-tow data for males to determine whether the decision to eliminate re-tow data for males is still the best use of the available data. In this year's SAFE, the authors provide a detailed analysis that provides compelling evidence that males shift their distribution by the time of the re-tows so that male abundance is underestimated. The SSC appreciates the authors' attention to this issue. The SSC notes that the authors may want to consider the comments and recommendations regarding the use of resampling stations in the NMFS survey provided in the CIE review reports on the trawl surveys.

From previous CPT and SSC reviews, the authors provided three alternate time periods to determine Biological Reference Points: 1969-1983, 1969-2012, and 1984-2012. In particular, the authors used average recruitment over each of the three time periods to calculate B35%. Results of this analysis show that selection of the time period is extremely important. If the early time period is used, the stock would be declared overfished. If the entire time period is used the stock would be considered close to overfished. The authors recommended using the intermediate time period 1984-2012 corresponding to the 1976/77 regime shift, in which the stock is not overfished.

The SSC appreciates the authors' consideration of breakpoints for estimation of biological reference points; however, we note that the analysis is incomplete. At the request of the SSC, participants at the Stock-Recruitment (SR) Workshop in April 2012 considered methods for estimating possible time periods as the baseline for calculating reference biomass. The provisional Workshop report identified 6 methods to identify temporal breaks in the productivity of stocks. Essentially, the authors used a combination of Alternative A2.1 (review of the recruitment time series), Alternative A2.4 (identify statistical breakpoints in an environmental time series) and Alternative A2.3 (identify breakpoints in the R/S relationship) in their analysis. Specifically, they only evaluated the change in productivity for a pre-defined suite of breakpoints. The SSC asks the authors to consider the recommendations in the provisional SR workshop report wherein a full range of possible breakpoints is considered, and consideration of the provisional preferred alternative A2.6. The SSC acknowledges that SR relationships and environmental shifts in carrying capacity are at the core of the selection of breakpoints in stock productivity.

As a part of future discussions of the pros and cons of taking the next step to use the breakpoints for the determination of reference points, the SSC requests that the authors and the CPT consider the reliability of the SR relationship and whether the reliability is sufficient to move the stock to Tier 1 or 2. In the case of crab stocks where experience from the GOA shows depletion can result in extended periods of low

production, the authors should consider the ecological risks associated with managing the stocks at low stock size and whether this approach is consistent with the precautionary approach.

The SSC agrees with the caveat included in the SR report that the provisional preferred approach is *"intended only to estimate the breakpoints; estimates of other quantities obtained in the process of determining the breakpoints do not have to be used for management purposes"*. Thus, once a breakpoint is identified, the authors should consider its plausibility. In the case of BBRKC, the authors provided several lines of evidence to support their selection of the 1984-2012. This is a critical step in the analysis. While statistical methods can be used to identify potential breakpoints, some breakpoints may not be biologically plausible. A breakpoint should result in a full range of plausible recruitments at low and high spawning biomass levels and be consistent with a well-defined shift in the Bering Sea ecosystem. The SSC agrees that the 1984 breakpoint is plausible and thus concurs with the authors' use of the time period 1984-2012 for determination of reference points for 2012/13. However, given the uncertainty associated with selection of time periods, the SSC considers selection of the time period to be a source of uncertainty in the assessment that contributes to our decision to recommend a 10% buffer between the ABC and the OFL.

The authors considered two methods for evaluating retrospective bias in the assessment: (1) historical results and (2) the 2011/2012 model hindcast results (within-model approach). As was observed in previous years, the within-model approach showed a consistent trend where the model overestimates MMB. The SSC agrees with the CPT that the model appears to be slow to respond to declines in MMB. The SSC requests that the authors consider the mechanisms underlying the consistent overestimates in the model. The SSC requests that the authors consider the Joint PT report on retrospective analysis in future reports. Specifically, we ask the authors to include a plot of retrospective bias as a percentage of terminal year MMB. In the absence of a clear mechanism to explain why the model is slow to respond to declines in MMB, the SSC continues to view this trend as a source of additional uncertainty in the assessment that contributes to our recommendation for a 10% buffer between ABC and OFL.

The SSC accepts the ABC and OFL recommendations of the authors and the CPT. Based on the results of Model 7ac, the stock is in Tier 3b resulting in an OFL and ABC of 7960 t and 7170 t respectively. The stock is not overfished and overfishing did not occur.

Recommendations for next year:

In addition to the CPT recommendations for additional models in 2013, the SSC requests that the authors develop: (1) an option with no additional M periods and (2) an option without additional M periods and an additional survey selectivity period in the early 1980s.

Research:
1. Shifts in the center of distribution of BBRKC can be a function of depletion of the stock, the crab closure area, shifts in larval drift, habitat selection, or fishing. Study which of these potential causes contributes to the selection of a time period.
2. Work with flatfish authors to come up with a consistent approach to treatment of biomass outside of the survey area.
3. Look at changes in maturity, molting probability, and selectivity over time.
4. Look at impact of dropping hotspots as per CIE review.
5. Look at impact of corner stations for hotspots as per CIE review.
6. Look at BBRKC – impact of re-tows as per CIE review.
7. Conduct field studies of catchability (side-by-side tows).

The SSC and the PTs made several requests for additional model runs in 2011. These requests still stand.

Tanner Crab

The SSC received a report on the Tanner crab stock assessment from Lou Rugolo (NMFS-AFSC) and Jack Turnock (NMFS-AFSC). Diana Stram (NPFMC) and Bob Foy (NMFS-AFSC) provided the Crab Plan Team's review and comments. Andre Punt (Univ. Washington) reported on a break-point analysis that constitutes an appendix to the stock assessment. Public testimony was provided by Edward Poulsen (Alaska Bering Sea Crabbers).

The Tanner crab stock assessment model (TCSAM) was accepted by the SSC in June 2012 for use in managing the Tanner crab fishery as a Tier 3 stock. Recent changes in the assessment model in response to comments by the Crab Plan Team and SSC are described in the assessment document. Some short-term and long-term recommendations have yet to be addressed. The Crab Plan Team provided a number of additional long-term recommendations, as listed on p. 5 of the Crab Plan Team report from their September 2012 meeting and the SSC supports those requests. However, based on response by the analysts to questioning, it was not clear to the SSC that model fits to discards in the snow and red king crab fisheries was a large issue. The SSC encourages the analysts to continue to explore alternative model formulations (variable growth, variable mortality, etc.) that may address patterns in model residuals (e.g., Fig. 37 and 39). **The SSC continues to support use of TCSAM (base model = model 0) for assessment and management of the eastern Bering Sea Tanner crab as a Tier 3 stock, starting with this year's (2012/13) assessment.**

The status determination of the eastern Bering Sea Tanner crab stock under Tier 3 hinges heavily on the choice of the time period used to calculate mean recruitment. Five time periods for averaging recruitment were explored: R1 (1966-1972), R2 (1966-1988), R3 (1982-2012), R4 (1966-2012), and R5 (1990-2012). These are shown in Fig. 56 of the assessment report, where year corresponds to year of recruitment to the model, which occurs at approximately crab age 5. The assessment authors recommended R2. This choice was not supported by the Crab Plan Team because this time period may not represent the current reproductive potential of the current stock. Also, some members were concerned about using recruitment estimates for 1966-1973 because there are no direct estimates of these recruitments. Those estimates are hindcast by TCSAM based on observations primarily in the survey time series, which begins in 1974. Instead, the team recommended using recruitment averaging time period R5 (1990-2012). This recommendation was based on a break-point analysis conducted by a team member and reported as an Appendix to the assessment. This break-point analysis, which examines changes in the relationship between a measure of stock productivity and stock biomass, was one of the methods considered for this purpose at a recent joint plan team recruitment workshop. The Tanner crab data support a change in relationship in 1985 (year of spawning) corresponding to 1990 (year of recruitment to the assessment model). Adoption of the use of R5 under a Tier 3 assessment would result in an increase in the OFL from 2.75 thousand tons in 2011/12 (based on Tier 4 analysis) to 19.02 thousand tons in 2012/13 (based on Tier 5 using the R5 period). The Crab Plan Team recommended a three-year stair-step approach toward setting ABCs in a precautionary manner under R5 to allow for additional analyses to address some uncertainties.

The SSC was hesitant to accept either the stock assessment author's or team's recommendations on the period of averaging. The author's recommendation (R2: 1966-1988) does not include more recent years of low stock productivity. Although the SSC continues to support break-point analyses as a useful approach to identify periods of productivity, the SSC was hesitant to accept the team's recommendation (R5: 1990-2012) at this meeting. First, the analysis was somewhat cursory and several additional research needs on this analysis were identified, including exploring alternative stock-recruit formulations (e.g., Beverton-Holt), and the possibility that the shift in productivity is due to depensation (reduced productivity due to spawner limitation). Second, results indicated several potential break points with

similar measures (AICc) of model fit (Appendix Fig. 2). Third, break-point model fits were shown for break points in 1965-1976 and 1989-2001, but those for 1977-1988 were not shown (Appendix Fig. 1). The SSC would be interested to see these.

As an interim measure, the SSC recommends management of the eastern Bering Sea Tanner crab fishery under Tier 3 using the time period of averaging of recruitment R3 (1982-2012). This results in an OFL of 19.00 thousand tons for 2012/13. The SSC recommends an ABC of 8.17 thousand tons for 2012/13 by using the stair-step approach recommended by the Crab Plan Team for the same reasons given by the team. As a matter of happenstance, the specifications for 2012/13 are identical using either R3 or R5. In making this interim recommendation to use R3, the SSC attempted to consider a time period represented by reasonably estimated recruitments. In this regard, the SSC discussed the merits of the R3 (1982-2012) and R4 (1966-2012) alternatives. The SSC felt that the time period corresponding to reasonably estimated recruitments was likely to correspond to some time period somewhere in between these two alternatives (i.e., some starting year after 1966 and before 1982) for the following reasons. First, the time series of recruitments estimated by the base model shows huge confidence intervals on the recruitment estimates corresponding to fertilization years through the late 1960s (Fig. 42), so those earlier years are clearly not reliable. These correspond to periods of recruitment to the model through the early 1970s (Fig. 56). Second, related to this and as previously stated, some members of the team were concerned about using recruitment estimates for 1966-1973 because there are no direct estimates of these recruitments. Third, the SSC discussed that there may be ecological justification for a break point in productivity sometime within the time frame represented by a time series intermediate between R3 and R4. A major ecosystem regime shift occurred in the late 1970s. This shift included a large increase in some groundfish stocks and declines in some forage fish, crab, shrimp and other species. Stomach analyses show that major predators of young Tanner crab are Pacific cod, flathead sole, and to a lesser extent, yellowfin sole. Shifts in predation mortality could alter productivity as measured by recruitment to the model relative to spawning biomass. In addition to identifying the first year of the recruitment time series, the inclusion of the most recent recruitments, which are equally uncertain, should also be reconsidered.

The SSC requests further analysis of alternative recruitment time periods by the stock assessment authors and Crab Plan Team to include options based on years in which recruitment was reasonable estimated, additional break-point analyses, and evidence for shifts in Tanner crab life history and ecology. The SSC requests that one option should include a time series spanning the extent of reasonably estimated recruitments based on confidence intervals for recruitment. Based on Fig. 42, it would seem that this time series should start with fertilization years beginning in the late 1960s (e.g., 1966), corresponding to a years of recruitment to the model starting in the early 1970s (e.g., 1971). Other options might include time periods corresponding to years in which recruitment was directly observed, and break-point analytical results including models with the break point in 1990 and other years with favorable AICc scores (Appendix Fig. 2). In evaluating the alternatives, the analysts and team should consider evidence for shifts in life history and ecology, which might include changes in predation and oceanography. SSC member Gordon Kruse mentioned a recent cooperative study using a Regional Ocean Modeling System (ROMS) showing a marked reduction in the retention of Tanner crab larvae in the Bristol Bay area and an increase in settling in the Pribilof Islands area since 1990. A manuscript reporting on these results is currently under revision and will be provided to the Crab Plan Team shortly.

Over the long term, Tanner crab productivity should be evaluated based on better measures of spawning biomass than mature male biomass, as currently used, which ignores the dominant role of females in reproduction. Ongoing studies on reproductive potential of red king crab and snow crab may shed some light on this. Toward this, the SSC requests the assessment authors to include a plot similar to Fig. 54 of the assessment chapter in which recruitment (y-axis) is plotted against egg production indices (x-axis) from Fig. 14.

Pribilof Islands Red King Crab

The fishery for red king crab in the Pribilof Islands district has been closed since 1999 due to concerns of low abundance, imprecision of biomass estimates, and pot bycatch of blue king crab, which are classified as overfished. Fishing mortality since the closure of the directed fishery has been limited to incidental catches in other crab fisheries and in Groundfish fisheries. The SSC supports the CPT recommendation to continue using the same base years as used previously (1991 to the current year) for determination of B_{MSY} for the Pribilof Islands red king crab stock. The SSC also supports a Tier 4b designation for this stock, noting that the estimate of mature male biomass (3,302 t) is below B_{MSY} (5,136 t). Unlike previous years, estimates of mature male biomass (MMB) were calculated in the assessment as a 3-year weighted moving average, centered on the current year and weighted by the inverse variance. Under the Tier 4b designation, the OFL for 2012/2013 is 569 t.

The SSC agrees with the CPT recommendation to include additional uncertainty ($\sigma_b = 0.4$) when calculating the ABC using the P* approach, resulting in an ABC of 455 t. The SSC's support for this approach is based in large part on the recognition that the brief history of exploitation of this stock makes it difficult to identify an appropriate period of time suitable for establishing B_{MSY}, such that the true distribution of the OFL is poorly known.

The SSC supported the following CPT recommendations for the 2013 assessment: include CV's in tables of abundance estimates, include confidence intervals in the table of weighted moving average estimates of abundance, and consider the use of Kalman filter as an alternative to moving average for estimation of MMB. The SSC requests that the authors include the observed and the state equations used for the Kalman filter analysis.

Pribilof Islands Blue King Crab

The SSC supports the CPT and author's recommendation for management of Pribilof Islands blue king crab under Tier 4c. Following the advice of the CPT, the SSC recommends a Tier 5 calculation of average catch mortalities between 1999/2000 and 2005/2006, resulting in a total catch OFL of 1.16 t. Similarly, the SSC supports using a 10 percent buffer for the ABC calculation, resulting in an ABC_{max} of 1.04 t. The Pribilof blue king crab stock is overfished, however overfishing did not occur during the 2011/2012 season.

The MSY stock size (B_{MSY}) is based on mature male biomass at mating (MMB_{mating}) which serves as an approximation for egg production. For 2011/2012, $B_{MSY}^{prox} = 3,944$ t of MMB_{mating} derived as the mean MMB from 1980 to 1984 and 1990 to 1997. The stock demonstrated highly variable levels of MMB during both of these periods likely leading to uncertain approximations of B_{MSY}.

Retained catches for Pribilof Island blue king crab have not occurred since 1998/1999. Bycatch and discards have been steady or decreased in recent years, although a change in calculation methodology led to an increase in 2011/12. Stock biomass decreased between the 1995 and 2008 surveys and continues to fluctuate with no significant change estimated for recent years due to the high uncertainty in estimates. Based on September 2011 CPT and SSC comments, biomass estimates are now based on a 3-year weighted average, centered on the current year and weighted by the inverse of the variance.

A revised rebuilding plan was approved by the Council in June 2012 and will soon go through final review by the Secretary of Commerce. The revised rebuilding plan closes the Pribilof Habitat Conservation Zone to Pacific cod pot fishing.

Saint Matthew Island Blue King Crab

In June 2012, the SSC approved use of the three-stage catch-survey analysis for the fall 2012 fishery under Tier 4. From this model, the estimated biomass (MMB) in 2012 is 5.63 thousand t. The estimated total male OFL is 1.02 thousand t, as recommended by the team. Likewise, the maxABC is 1.02 thousand t based on CV = 0.5 and P*=0.49. However, the SSC concurs with the Crab Plan Team recommendation for a 10% buffer for an ABC of 0.92 thousand t due to structural assumptions and observational uncertainties in this assessment.

The SSC offers the following remarks to the assessment author. There is significant improvement in model evaluation. The SSC agrees with the Crab Plan Team on the need to develop diagnostic tools to understand and improve model performance (e.g., residual plots). For 2013, the SSC concurs with the Crab Plan Team that the author should explore an alternative model that merges characteristics of model B and model C, perhaps allowing two different Ms (one for 10 years ago and one for the recent 10 years). In addition, the SSC recommends that the author should fix the seed in the simulation, as it can help future reviewers to repeat and verify the simulation results. The Crab Plan Team offered some additional comments to the author, with which the SSC concurs. In addition, the SSC identified an important research need to investigate the annual molting frequency (and growth increment) with pre-molt size.

Aleutian Islands Golden King Crab CPUE Standardization

The authors have developed a method to standardize catch and effort for observer pot sample data and retained catches (fish ticket data) for future input to the assessment model. They incorporated recommendations made by the Crab CPT at its May 2012 meeting and the SSC at its June 2012 meeting. The SSC agrees that the assessment authors have made significant improvement in the model. The authors might consider using CART (classification and regression tree) models to investigate interactions among predictor variables, while avoiding the problems with co-linearity.

D-1(d) Northern Bering Sea Research

The Northern Bering Sea Research Area (NBSRA) discussion paper was presented by Steve MacLean (NPFMC). Public testimony was presented by Dorothy Childers (Alaska Marine Conservation Council)

This discussion paper was intended to provide background information to the Council for evaluating the feasibility and need to continue developing a NBSRA research plan. Efforts to develop a research plan began in 2009. The SSC received an outline in June 2010 and a report on the plan in June 2011. The 2011 report focused primarily on a proposed paired design of a before-after-control-impact (BACI) study to be conducted in the northern Bering Sea (NBS). Based on responses from community workshops and SSC comments on the draft plan, the Council suspended development of a NBSRA Research Plan. The current document responds to the Council's request for a document that summarizes information on the NBS ecosystem, potential impacts from bottom-trawl fisheries, outcomes of community workshops, description of areas likely to attract commercial interests, and feasibility of conducting more research on effects of trawling. The purpose to which this white paper will be used to frame future actions was not made clear in the document or in meeting guidance.

The SSC appreciates that addressing all of the above requests was challenging given the paucity of historic information on the NBS and the rapid pace of current studies and climate-driven changes to a complex ecosystem. While AFSC staff did respond with an expanded document, **the document will need considerable revision if it is to be used to inform the public or incorporated into a research plan.** The SSC found the outline of historic research efforts and sources of data useful, but the document was incomplete and its organization confusing. There were also contradictory statements that may have

resulted from dealing with the same issue in multiple locations. Most of the SSC's editorial corrections will be provided to the AFSC authors in a separate document.

The ecosystem chapter provided a very brief overview of the underlying physical and biological oceanography of the NBS, but provided limited discussion of benthic pelagic coupling, potential changes in other physical or biological aspects (pH, storm seasonality, invasive species, range extensions) nor discussion of how these factors may interact or change seasonally. Notably, the benthic ecosystem most likely to be impacted was only described in a few sentences with no inclusion of a food web diagram. There was no discussion about current fisheries in the NBSRA – either commercial or subsistence. It would seem critical to any plan being developed that there be a clear understanding of the current exploitation rates, and the ways in which ongoing human activities might be impacting the system.

Sections on marine mammals, birds, invertebrates, and fish were inconsistent in the amount and type of information presented, information accuracy, and conclusions relative to potential impacts from bottom-trawling. Species of particular importance as subsistence resources were not fully addressed, such as seabirds (ie, the adults and eggs of auklets, kittiwakes, murres, gulls), fish (ie, herring, capelin, smelts), and invertebrates (clams). The pending federal action with respect to listing and critical habitat for bearded and ribbon seals was not mentioned. There was inadequate coverage of cumulative effects, such as changes in climate and ice extent, that may have impacts on prey available to upper trophic level groups. This is particularly relevant for benthic foraging species such as grey whales, walrus, and bearded seals, which may be forced to change their foraging locations and concentrations in response to shifts in prey abundance, or the presence of sea ice in preferred foraging areas. In particular, walrus that are aggregating on shore (rather than dispersed across sea ice) may have much higher than 'normal' impacts on benthic communities in the areas surrounding terrestrial haulouts. Fishing pressures in these areas, if overlapped, may have much greater impacts on walrus than in other areas.

The section on the design and method considerations for a study on the impact of bottom trawls captured many of the key issues. The paper summarized studies in the southeastern Bering Sea that showed that only minimal bottom trawl impacts were observed that could not be differentiated from random variation. Yet, researchers have been able to detect and quantify the recovery of the benthos from foraging activities of grey whales and walrus. The paper suggests that if commercial bottom-trawl fisheries are developed, the chronic effects of bottom-trawling could be examined through use of closed and open-area boundaries in the Modified Gear Trawl Zone. The paper's authors rightly note that '... discerning bottom-trawl impacts on the NBS ecosystem **will require substantial commitment in time and resources.**' Overall, good study design, statistical and ecological analyses, and understanding of local recovery dynamics will be needed. Further, the paper notes that these studies will need to be long term to capture ecosystem-level changes, and this will be more challenging given the changes predicted to occur in the NBS. A major impediment to such a study is the lack of funding.

The paper notes that communities bordering the NBSRA are 'dominated by subsistence activities and seasonal employment opportunities' and rightly concludes that this issue is of particular importance to members of those communities. However, **a more explicit section summarizing (and providing references for) what is known about subsistence uses of key species by the communities is needed. The SSC reiterates that it is important to involve local communities into the process early in development of NBS plans and that the research focus should be on the benthic environment,** which is most likely to be impacted by bottom-trawl fisheries. Should the Council move forward with development of a NBSRA Research Plan, it should improve this discussion paper with respect to protected resources and potentially impacted ecosystem components. More importantly, it will need to include local community input and commit to a long term program.

MEETING ATTENDEE SIGN-IN SHEET
_____, 20___   N.P.F.M.C. MEETING

PLEASE REGISTER ATTENDANCE FOR MEETING RECORDS

PLEASE PRINT - THANK YOU!

NAME	AFFILIATION
Todd Loomis	Ocean Peace, Inc.
Jimmy R Worths	SC/R
GLENN REED	PSPA
Frank Kelty	City of Unalaska
Akmi Thompson	Alaska Crab Coalition
Jeff MacInger	At-Sea Processors Assn.
Cynthia Suchman	North Pacific Research Board
BRUCE S. GABRYS	commercial FISHER
Kathy + Ed Hansen	SEAFA
Jeanne Hanson	NMFS
Bob Krueger	AWTA
Donna Parker	Arctic Storm
Michael LAKE	Alaskan Observers, Inc.
Heath Hilyard	Southeast Alaska Guides Org.
STOIAN IANKOV	F/V Michelle Renee
Hugh PELKEY	F/V High Roller AKUTAN Fishery Association
Simeon Swetzof Jr.	City of ST. Paul
Vince O'SHEA	PSPA

MEETING ATTENDEE SIGN-IN SHEET
_____, 20____ N.P.F.M.C. MEETING

PLEASE REGISTER ATTENDANCE FOR MEETING RECORDS

PLEASE PRINT - THANK YOU!

NAME	AFFILIATION
Ricky Gease	KRSA
Kris Norosz	Icicle
Joe Childers	
Bob Stumpf	
Sarah Melton	Franklin & Ash, LLC
Bill Jacobson	Kodiak / Fisherman
Margie Bauman	Fishermen's News Cordova Times
Jeff Stephan	UFMA - Kodiak
Mike Szymanski	PFI
Trey Tirrell	Cordova Fisherman
Brent Paine	UCB
Luci Roberts	APICDA
Dick Tremaine	Siu Alaska
Brian Lynch	Incoming PVOA ED
David Polushkin	K-Bay Fisheries Assoc
Tyson Kaell	Van Ness Feldman
Pat Hyolina	Icicle Seafoods, Inc
Elizabeth Wiley	Westward

MEETING ATTENDEE SIGN-IN SHEET

_____, 20____   N.P.F.M.C. MEETING

PLEASE REGISTER ATTENDANCE FOR MEETING RECORDS

PLEASE PRINT - THANK YOU!

NAME	AFFILIATION
JOE PLESHA	TRIDENT SEAFOODS
Heather McCarty	McCarty & Associates
GLENN REED	PSPA
Matt Upton	US Seafoods
TERRY HAINES	CREWMEN'S ASSOCIATION
MARK GLEASON	ALASKA BERING SEA CRABBERS
Beth Stewart	Peninsula Fisherman's Coalition
Sinclair Wilt	ALYESKA SEAFOODS INC
Colary Gromoff	Aleut Corp.
Paul A. Shadura II	Kenai Peninsula Fishermans Assoc
CRAIG CROSS	NONE
Madelyn cross	Craig Crossi
Andrew Manos	Lyg St. Elias
Dawson Hoover	CVRF
Lori Swanson	Groundfish Forum
Neil Rodriguez	CVRF