Report of the September 2018 Joint Groundfish Plan Team meeting

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Meeting overview

- Dates: September 18-19
- Place: AFSC Seattle lab
- Leaders: Jim Armstrong (GOA coordinator), Jim Ianelli (GOA co-chair), Chris Lunsford (GOA co-chair), Diana Stram (BSAI coordinator), Grant Thompson (BSAI chair)
- Participation: 23 Team members present, plus numerous AFSC and AKRO staff and members of the public
  - Plus 1 individual nominated for Team membership
- File containing minutes includes Joint, BSAI, GOA
  - Bookmarked, and with “clickable” Table of Contents
- Documents and presentation files available on the Team agenda site
  - Link provided on Council agenda site (under item C2)

Agenda (1 of 2; action items in red)

- Administration
- Report from the June BSAI Team workshop
- ABC < maxABC
- ESP process update
- SSC generic assessment requests (no action, but please read anyway)
- Dialogue on OK-ness of ESR and assessment information
- SSC assessment prioritization requests
- Rationales for requests to authors
- Ecosystem climate update
- BS bottom trawl survey
- Use of model-based estimates

Agenda (2 of 2; action items in red)

- AI bottom trawl survey
- Longline survey
- Sablefish
- Sharks
- Observer Program update (see separate presentation)
- Halibut DMRs
- Economic SAFE report (SSC will review in February)

Report from the June BSAI workshop

- Topics:
  - Ensemble modeling
  - ABC adjustments
- Personnel:
  - Co-chaired by A. Haynie, A. Hicks, D. Stram, G. Thompson
    - D. Stram also rapporteur
    - D. Hanselman also played a major role before moving to SSC
  - At least 46 participants
    - BSAI, GOA, and Crab Teams were all represented
- Purpose: To develop recommendations for the two topics, to be considered by the Joint Teams at their September meeting
- Ambitious agenda, including several items requested by the SSC

Report from the June BSAI workshop

- Over 20 presentations (available online—see link in workshop report)

3. ENSEMBLE MODELING	
3.1. Brief descriptions of ensemble modeling and model averaging	Thompson
3.2. The dividing line between statistics and machine learning	Thompson
3.3. Examples of ensemble modeling in fisheries stock assessment: the American experience	Hicks
3.4. Examples of ensemble modeling in fisheries stock assessment: the ICES experience	Johnson
3.5. Examples of ensemble modeling in other disciplines	Bond
3.6. Lessons from the 1998 NRC study	Thompson
3.7. Review the 2017 SSC ensemble modeling workshop	Hicks
3.8. Review the NSAW on ensemble modeling	Hanselman
3.9. Choosing models in an ensemble	Thompson
3.10. Combining models and assigning weights	Thompson
3.11. Calculating statistics and uncertainty	Thompson
3.12. Pros and cons of implementation in NPFMC system	Ianelli/Thompson
3.13. Communicating and using results	Co-chairs
3.14. Workload and logistics for assessment authors	Thompson
3.15. Identifying assessments amenable to ensemble modeling	Co-chairs
4. DETERMINING ABC	
4.1. Review how maxABC and ABC are determined in NPFMC system	Stram
4.2. Examples of reductions from maxABC in the past	Hanselman
4.3. How can ensemble modeling inform maxABC and ABC	Hicks
4.4. Other methods of accounting for uncertainty when determining ABC	Thompson/Hanselman
4.5. Potential tools/metrics for guiding reductions	Haynie
4.6. The role of ecosystem or socio-economic considerations in reductions from maxABC	Haynie

Report from the June BSAI workshop

The Teams endorsed the workshop's ensemble modeling recommendations

1. …ensemble model should be treated the same as any other "selected" single model
2. Continue efforts on ensemble modeling, including in this year's
3. Resolve the following critical issues related inclusion, weighting schemes, added complexity, status determination, candidate stocks
4. BS Pacific cod and northern rock sole and/or yellowfin sole assessments selected
5. Other considerations
    a. supporting a simple model for management purposes
    b. improving transparency and alleviating review and model selection
    c. Workload increase (fo authors, Plan Team, SSC

Report from the June BSAI workshop

- The second major topic of the workshop was ABC adjustments
  - Recommendations of a general nature only, sub-group formed
- Any reductions of ABC should be transparent and clearly described. SAFE report Intro to outline impacts, e.g.,
  - Potential direct and indirect biological, ecosystem, and/or socioeconomic implications
  - Hypotheses and empirical support related stock circumstances?
  - How to better understand the circumstances and uncertainties?
- AFSC task staff to continue to work on P* and decision theory approaches to develop uncertainty-based buffers, for example:
  - Update the previous analysis using survey uncertainty
  - Determine the P* implied by a single “best model” approach relative to an ensemble approach
  - OFL/ABC buffer if assessment model uncertainty lacks structural uncertainty (e.g., as potentially captured in an ensemble approach)

ABC < maxABC sub-group meeting (Aug 2018)

- Subgroup of Plan Team members met following the workshop to develop an approach for presentation to the Joint Teams in September.
- Two approaches, presented
  1. Multi-variate logistic approach
     - Statistical analysis of 25 variables resulting in historical ABC reductions in either BSAI or GOA from 2003-2017
     - Teams appreciated the historical context and review of past ABC reductions
  2. Risk Classification Approach: 3 proposed considerations for support of an ABC reduction
     1. Assessment-related considerations
     2. Population dynamics considerations
     3. Environmental/Ecosystem considerations

ABC < maxABC sub-group meeting

- Risk classification approach selected by Teams moving forward; companion table for discussion purposes presented of % reductions associated with categories referred to futher discussion and policy decisions

	Assessment-related considerations	Population dynamics considerations	Environmental/ecosystem considerations
Level 1: Normal 	Typical to moderately increased uncertainty/minor unresolved issues in assessment	Stock trends are typical for the stock; recent recruitment is within normal range.	No apparent environmental/ecosystem concerns
Level 2: Substantially increased concerns 	Substantially increased assessment uncertainty/ unresolved issues.	Stock trends are unusual; abundance increasing or decreasing faster than has been seen recently, or recruitment pattern is atypical.	Some indicators showing an adverse signals but the pattern is not consistent across all indicators.
Level 3: Major Concern 	Major problems with the stock assessment, very poor fits to data, high level of uncertainty, strong retrospective bias.	Stock trends are highly unusual; very rapid changes in stock abundance, or highly atypical recruitment patterns.	Multiple indicators showing consistent adverse signals a) across the same trophic level, and/or b) up or down trophic levels (i.e., predators and prey of stock)
Level 4: Extreme concern 	Severe problems with the stock assessment, severe retrospective bias. Assessment considered unreliable.	Stock trends are unprecedented. More rapid changes in stock abundance than have ever been seen previously, or a very long stretch of poor recruitment compared to previous patterns.	Extreme anomalies in multiple ecosystem indicators that are highly likely to impact the stock. Potential for cascading effects on other ecosystem components

Ecosystem and Socio-economics Profile (ESP)

4-step process:

1. a priority list of stocks for which ESPs should be developed
2. a set of metrics to grade stock vulnerabilities
3. a set of indicators to monitor
4. a set of reporting templates to include in the SAFE reports and provide to fishery managers.

- Where applicable, the ESP may replace the existing ecosystem considerations section of the individual SAFE report chapter
- Stock assessment authors are encouraged to use indicators from the ESR to assist with stock-specific analyses for this section

ESP

The Teams recommended

- Continued coordination with ESR and ESP development
- Incorporating ROMS output into this framework in coordination with existing national initiatives and delivery of these outputs
- ACLIM project coordination on projection modeling trends and defining appropriate time frames
- Upcoming discussion papers on skipper surveys and ongoing socio-economic work
- Continue to keep ecosystem information in context for istock assessment authors and keep the larger ecosystem context in mind
- Continue to coordinate the myriad of individual efforts for ESR, ESP, and ongoing economic work

SSC assessment prioritization requests

- The Teams recommended that the following two criteria focused on catch and estimated survey abundance require an off-year assessment:
  1. A substantial and unexpected change in total catch
  2. An unexpected major change in survey biomass

- Additionally, the Team recommend an example list of conditions that may require conducting an assessment out of cycle along with a list of indicators of cost and benefits

BS bottom trawl survey

- Given recent and projected warm conditions and recent distributional trends, the Teams recommend that the NBS survey extension is conducted again in 2019 (and future years as needed) in order to support assessment estimates of fish biomass

Sablefish

- Presentation on
  1. Alternative modeling approaches for fishery selectivity
  2. Explorations for developing a prior distribution for natural mortality
  3. Update on ongoing apportionment analyses
     - The authors continue to recommend the static apportionment method that has been used recently in the sablefish assessment while also presenting the apportionment corresponding to the previously used method for reference
     - The Teams recommend continued development of the apportionment MSE

Sharks

- Pacific Sleeper Sharks (PSS), which are one of the most data-poor/data-limited populations
- Research projects:
  - Pilot study on age determination methods
  - Spatial analysis to examine catch location/time/depth/temp/haul duration, etc., as some hauls can catch hundreds of small PSS
  - Discard mortalities are being examined through tagging and blood work, and data limited analysis methods are being examined
  - An observer special project was started to explore fish size and weight estimates
- More on catch estimation:
  - Most large PSS are not brought over the rail on longline vessels, and are therefore unavailable to be weighed
  - The weights that are assigned to PSS via the CAS are biased
  - One method to alleviate this would be to assess the population based upon numbers, but this has its own issues, one of which is that all other stock assessments are based upon weight
  - Therefore, work continues to try and improve estimates of catch by weight for PSS, particularly as EM becomes more prevalent
- The Teams encourage continued exploration of utilizing data limited methods for this assessment

Halibut DMRs

- Jim Armstrong led Halibut DMR Working Group
  - Starting in 2016, the fishery definitions for DMR estimates and application transitioned from species composition to vessel/gear operational characteristics causatively linked to halibut mortality
  - A reduced reference period (2-3 years) is used now in the estimation instead of the longer (10 year) reference period used previously, to incentivize improvement in halibut handling practices
  - The estimation process uses weighted averages of halibut mortality (condition data) to expand estimated DMRs from the sample to the haul, trip, and fishery following the sampling hierarchy
- Some improvements since last year include better identifying Rockfish Program trips in the dataset

Halibut DMRs

- Halibut condition data from the halibut deck-sorting EFP (Amendment 80 CP trawl) were excluded from the data summaries
  - This is due to the lower post-capture mortality of halibut sorted on-deck than halibut recovered during observer sampling in the factory
- EM data are not being used in the estimated DMRs for 2019
- EM data from 2018 may be used in future DMR estimates
  - However, FMA is also considering eliminating assessments of halibut condition (injury and viability) from EM vessels until there are EM-specific condition keys for reviewers
  - Assessment of condition is time-consuming and often still results in an “unidentified” condition because the reviewer cannot see both sides of the fish or cannot determine a key condition criterion
  - EM reviewers would continue to document release method and any mishandling of halibut that would affect their condition

Halibut DMRs

- Some future directions include completion of an IPHC study on halibut release methods, increased use of EM and understanding the implications thereof, regulatory deck sorting requirements, and improved basis studies for DMRs
- The Teams recommended the use of the current estimation methods, including the combined groupings and the 2-year reference period (2016-2017) as well as the average of the most recent 2 years (2015, 2017) for BSAI hook-and-line CVs for estimating DMRs for the 2019 fishing year

Halibut DMRs

2018 Operational Group							2019 Operational Group							
Area	Gear	Sector	RPP	Mean Annual $N_{viabilities}$	Estimate DMR?	DMR	Area	Gear	Sector	RPP	Mean Annual $N_{viabilities}$	Estimate DMR?	DMR	
BSAI	POT	None	N	548	Y	9%	BSAI	POT	None	N	380	Y	19%	10%
	HAL	CP	N	9,547	Y	8%		HAL	CP	N	6,886	Y	8%	0%
		CV	N	832	Y	17%			CV	N	360	Y/N ?	4%	-13%
	NPT	CP	N	2,025	Y	84%		NPT	CP	N	2,844	Y	78%	-6%
		CV	N	2,456	Y	60%			CV	N	2,736	Y	59%	-1%
GOA	POT	None	N	602	Y	7%	GOA	POT	None	N	450	Y	4%	-3%
	HAL	CP	N	1,631	Y	10%		HAL	CP	N	1,672	Y	11%	1%
		CV	N	3,286	Y	17%			CV	N	2,367	Y	21%	4%
	NPT	CP	N	132	N	84%		NPT	CP	N	1,300	Y	79%	-5%
		CV	N	755	Y	67%			CV	N	1,106	Y	67%	0.00%
		CV	Y	176	Y	62%			CV	Y	389	Y	49%	-13%