Report of the September 2019 Joint Groundfish ~~and Crab~~ Plan Team meeting

Alaska Fisheries Science Center

Grant Thompson

October 2, 2019

Meeting overview

- Date: September 17-18
- Place: AFSC Seattle lab
- Leaders: Jim Ianelli, Chris Lunsford (GOA GPT co-chairs); Sara Cleaver (GOA GPT coordinator); Grant Thompson, Steve Barbeaux (BSAI GPT co-chairs); Steve MacLean (BSAI GPT coordinator)
- Participation: 28 Team members present, plus numerous AFSC and AKRO staff and members of the public (many via WebEx)
- The Teams welcomed:
  - New GPT coordinators: Sara Cleaver (GOA), Steve MacLean (BSAI)
  - One new (unofficial) GPT member: Marysia Szymkowiak (GOA)
- Documents and presentation files available on the Team agenda site
  - Link provided on Council agenda (under item C5)

Agenda (action items in red)

- Administrative
- Research priorities
- Recruitment processes alliance and surveys
- EBS/NBS shelf trawl survey
- Longline survey
- GOA trawl survey
- Halibut discard mortality rates
- Sablefish discards
- Economic SAFE report
- Sablefish assessment
- AFSC genomics activity plan
- Risk table
- Marine mammal update

Research priorities (1 of 6)

- Jim Armstrong presented an overview of the Council's research priority process and the methods used to update groundfish research priorities
- Database contains 157 projects, of which 94 relate to groundfish
- Topics are organized online through a publicly accessible database that can be queried for changes in research status
- Research topics are ranked through four priority categories: Critical ongoing monitoring (COM), Urgent, Important, and Strategic
- Prior to the meeting, Team members were assigned to theme-based research project review subgroups
- Each group identified the top projects for the SSC to consider when developing its "top 10" list for the Council
- COM and Strategic priorities were not included for the top 10
- A second round of review by Team members, independent of subgroup assignment, identified ~~seven~~ eight top-scoring projects (see next slides)

Research priorities (2 of 6)

- Teams' top 8 (#1-3)

ID	Title	Description	Theme	Focus
171	**Acquire basic life history information (e.g., natural mortality, growth, size at maturity) for data-poor stocks**	Basic life history information is needed for stock assessment and 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 rates, size at maturity, and other basic indicators of stock production/productivity.	Stock assessment inputs	Age and growth, Maturity, Natural mortality
189	**Develop stock-specific ecosystem indicators and incorporate into stock assessments**	Develop stock-specific ecosystem indicators and incorporate into stock assessments. (in progress)	Ecosystem processes	Ecosystem indicators
176	**Refine methods to incorporate uncertainty into harvest strategies for groundfish**	Refine P* and decision theoretic methods to incorporate uncertainty into harvest strategies for groundfish for ACL estimation. Continue existing management strategy evaluations at the stock level.	Stock assessment methods	MSE

Research priorities (3 of 6)

- Teams' top 8 (#4-5)

ID	Title	Description	Theme	Focus
533	**Explore optimal sampling strategies and geospatial approaches for time series of survey data**	The Stock Assessment Improvement Plan seeks to ensure that NMFS conducts its surveys in the most effective and effecient manner possible. Statistical analysis of the optimal number of survey stations needed to accurately assess the status and trends of groundfish and crab stocks is required to achieve this goal. An extension of this activitiy would be to explore alternative abundance estimation methods. For example exploring Thorson's geostatistical model as an alternative to the designed-based estimates for abundance indices used in stock assessments is a potentially useful analysis. Extensions would include an assessment of whether there are certain life history characteristics or levels of aggregation when geospatial models are used.	Fishery Resource surveys	Development/improvement of survey methods
177	**Conduct prospective and retrospective analyses of changes in the spatial and temporal distribution of fishing effort in response to management and environmental changes**	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, multi-target crab fisheries) and environmental changes.	Fishery management	Impacts of measures

Research priorities (4 of 6)

- Teams' top 8 (#6-8)

ID	Title	Description	Theme	Focus
163	**Conduct routine fish, crab, and oceanographic surveys in the Arctic Ocean**	Dynamic ecosystem and environmental changes in the Arctic Ocean are occurring. Assessment of the current baseline conditions and trophic interactions is important. This effort should not supplant the regular surveys in the BSAI and GOA, which are of critical importance to science and management.	Ecosystem surveys	Initiation of survey
174	**Develop spatially explicit stock assessment models**	Develop spatially explicit stock assessment models. High priority species for spatially explicit models include: walleye pollock, snow and Tanner crab, Pacific cod, sablefish, yellowfin sole, rock sole, arrowtooth flounder, Pacific ocean perch, black spotted rockfish, rougheye rockfish, and Atka mackerel.	Stock assessment methods	Spatial models
366	**Continue to investigate time variation and the shape of fishery and survey selectivity models**	There is considerable controversy about (1) whether selectivity should be dome-shaped or asymptotic, and (2) whether selectivity should be time-varying by default. Using a dome-shaped curve can create a large increase in biomass which may not be real. Treating selectivity as time-varying increases the number of model parameters greatly, which may lead to confounding among parameters. Better scientific guidance through research studies is needed to address these two problems.	Stock assessment methods	Model parameterization

Research priorities (5 of 6)

- Teams recommended bringing forward the top ~~seven~~ eight list and initiating a process for taking projects off the list
  - "The list" at the end of the above is the *overall* list, not the list of 8
- Because one requirement for inclusion in the "urgent" category is an expectation that "a one or two year project would meet the information need," the Teams recommend that any project that has been ongoing for more than two years be removed from the "urgent" category

Research priorities (6 of 6)

- Several concerns were raised with the process:
  - Many of these are “ideas” rather than actual research proposals
  - Sometimes no explicit proposal or PI is identified
  - Process does not consider cost (just value)
  - No process for filtering, rewriting, or deleting priorities
  - Proposals are usually not from people who intend to do the research, so they are often vague and poorly defined
  - Projects that would naturally qualify as priorities do not get entered into the system (for examples, see BS/RE rockfish and Pacific cod in the BSAI and GOA Team minutes, respectively)
- Teams recommended that these issues be raised in the report to the SSC in February

EBS/NBS shelf trawl survey

- Results presented previously under agenda item B4 (AFSC Report)
- The Teams commend the Bering Sea survey group for their rapid and timely production of the survey estimates

Alaska Fisheries Science Center

Dennis Benjamin	Erin Fedewa	Chris Long	Ceceilia O'Leary
Lyle Britt	Jen Gardner	Vanessa Lowe	Jon Richar
Kelly Champagne	Rebecca Haehn	Michael Martin	Bethany Riggle
Connor Cleary	Jerry Hoff	Kevin McCarty	Kathryn Sobocinski
Jason Conner	Pam Jensen	Todd Miller	Duane Stevenson
Liz Dawson	Stan Kotwicki	Arianna Myers	Cynthia Yeung
Alex DeRobertis	Mike Levine	Dan Nichol	Leah Zacher

Other organizations

Zachary Kelleher	Andy Nault	Jonathan Schroeder
Hayley Mazur	Myra Scholze	Jeffrey Scott

Halibut discard mortality rates (1 of 2)

- Jim Armstrong presented an update on halibut Discard Mortality Rates (DMRs) along with recommendations for the 2020 and 2021 fisheries
- A hierarchical sampling design is followed that relies on random sampling of halibut to produce DMR estimates for major gear types
- DMRs are derived from at-sea observer-based data only, as there are no viability protocols established for EM
- The proportion of vessels covered by EM has increased, resulting in fewer viability assessments
- Several new research projects were mentioned that are exploring alternative methods for estimating viability
- However, no changes were recommended to the current methods
- The Teams concur with the working group recommendations to maintain current methods and to use the two-year reference period (2017-2018) for producing the 2020 and 2021 DMRs

Halibut discard mortality rates (2 of 2)

Table 1. 2019 halibut DMRs specified for fishery operational types defined for halibut PSC management in GOA and BSAI groundfish fisheries and halibut DMR Workgroup recommendations for 2020 and 2021.

Area	Gear	Operation	2019 DMR	2020/2021 DMR
BSAI	Pot	All	19%	27%
	Hook-and-line	CP	8%	9%
	Hook-and-line	CV	4%	9%[a]
	Non-pelagic trawl	Mothership / CP	78%	75%
	Non-pelagic trawl	CV	59%	58%
GOA	Pot	All	4%	0%
	Hook-and-line	CP	11%	11%
	Hook-and-line	CV	21%	13%
	Non-pelagic trawl	Mothership / CP	79%	75%[b]
	Non-pelagic trawl	CV	67%	68%
	Non-pelagic trawl	CV-Rockfish Prog	49%	52%
All	Pelagic trawl	All	100%*	100%*

[a] Based on BSAI HAL CP

[b] Based on BSAI NPT CP

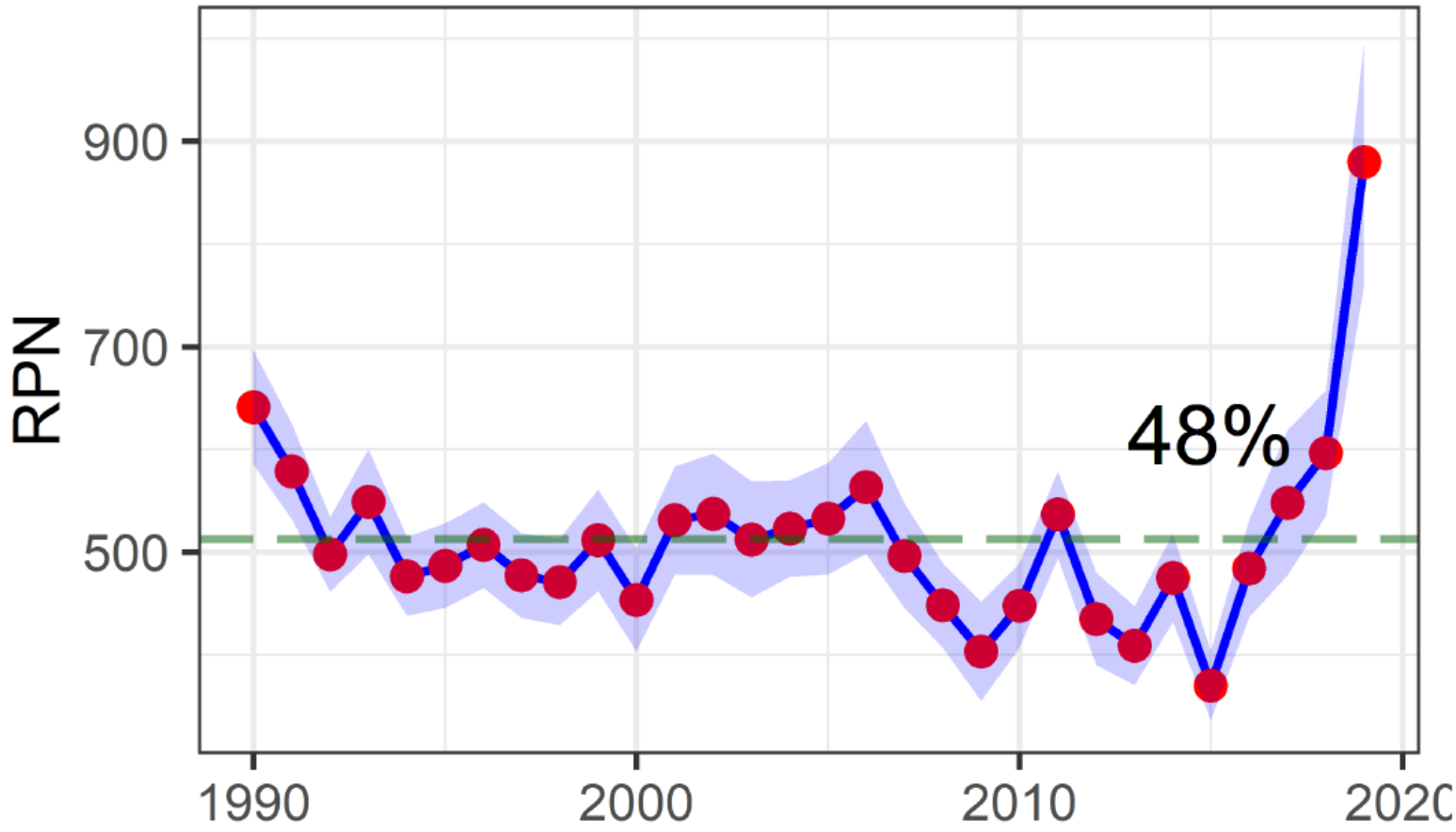
*Fixed, not estimated

Sablefish assessment (1 of 10)

- Dana Hanselman presented an update of the stock assessment
- 2019 RPN index increased by 48% from 2018 and is the largest in the time series since 1990
- Much of this increase is attributed to the BS and AI, while the GOA is catching up and is now above the long-term mean
- The 2018 longline survey and fishery age compositions were dominated by fish under age 5 (50-60%)
- The 2014 year class will be around 50% mature, which will increase spawning biomass in the model
- No model changes expected for the 2019 assessment
- Dana may recommend reduction from maxABC using the risk table
  - 2019 ABC was reduced by 45% from maxABC

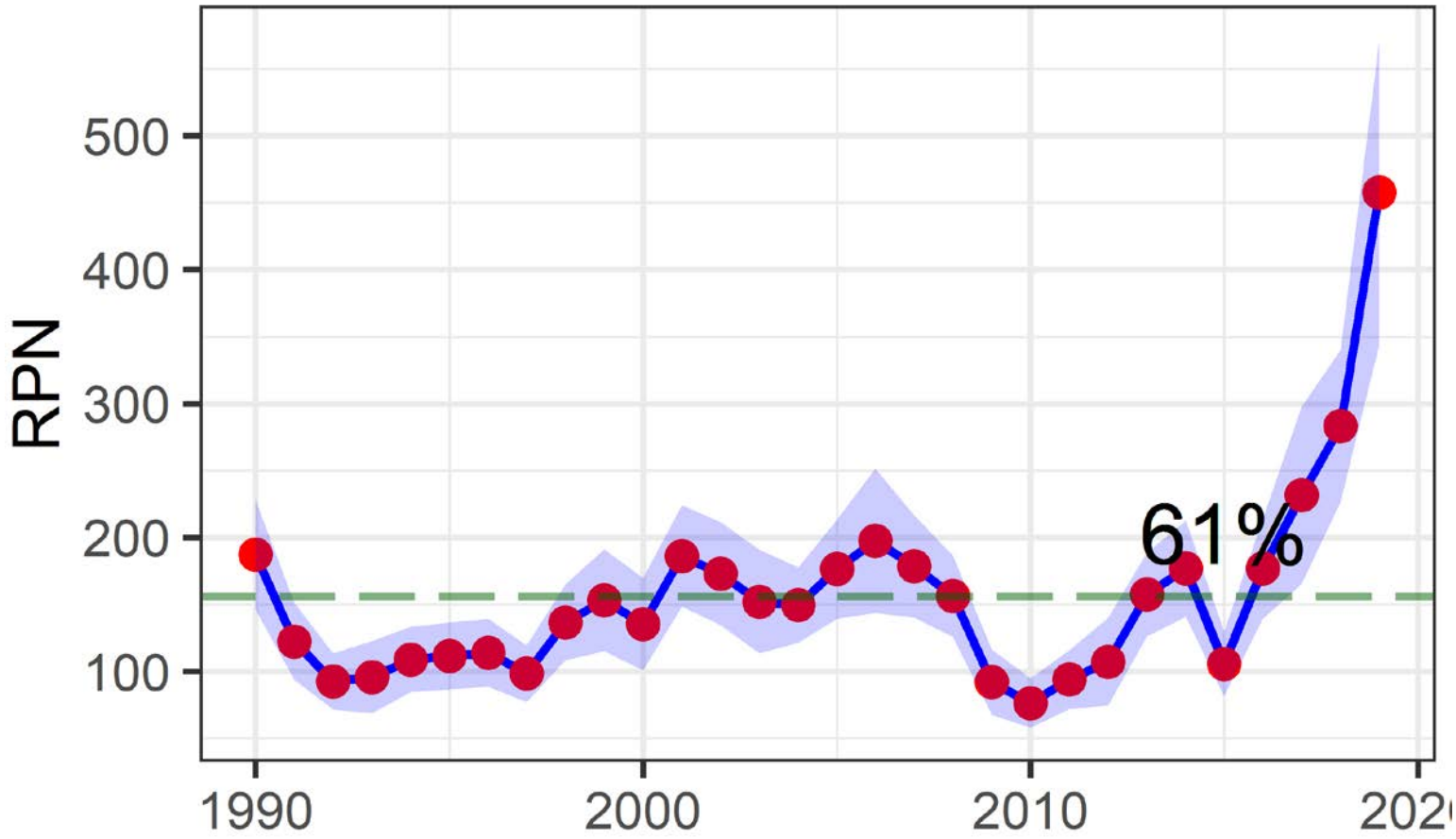
Sablefish assessment (2 of 10)

- Longline survey results (all areas)



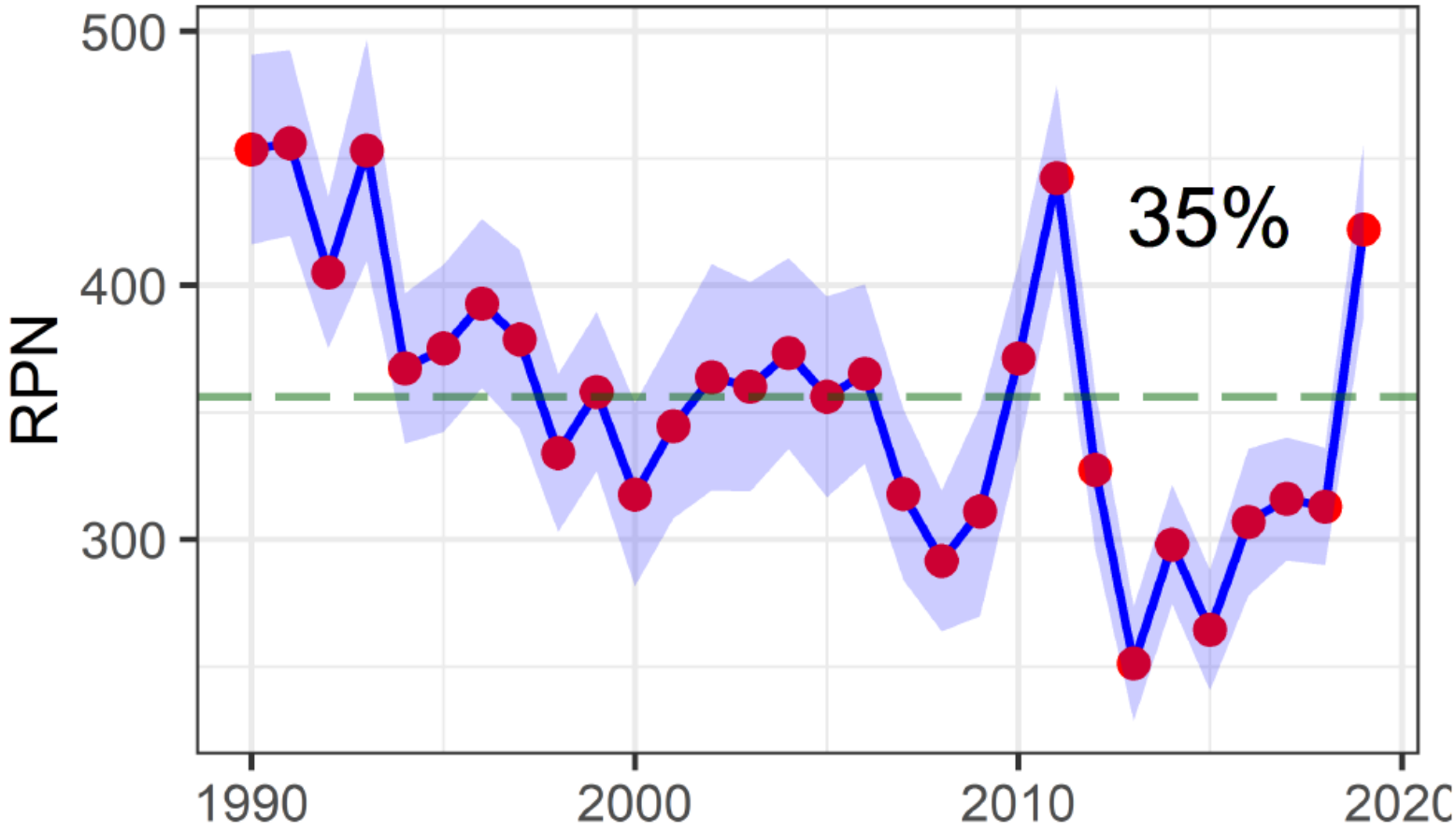
Sablefish assessment (3 of 10)

- Longline survey results (BSAI only)



Sablefish assessment (4 of 10)

- Longline survey results (GOA only)



Sablefish assessment (5 of 10)

- BS catch is rapidly approaching OFL, due to bycatch in trawl fleets
- The Teams discussed the mismatch between the Alaska-wide stock assessment and the region-specific OFLs and ABCs
  - Holdover from when FMP-specific assessments were conducted
  - Has not been an issue, so no reason to change until now
  - Sablefish is the only groundfish stock with an assessment that spans the BSAI and GOA FMPs
  - Reporting stock status is awkward, because separate OFLs are specified, but only their sum “counts” in status determination
- Dana proposed combining OFLs for each FMP area (1 BSAI, 1 GOA)
- The Teams noted that exceeding the OFL for the BS alone was not a conservation concern and, if possible, combining the OFL for the BS and AI would be acceptable

Sablefish assessment (6 of 10)

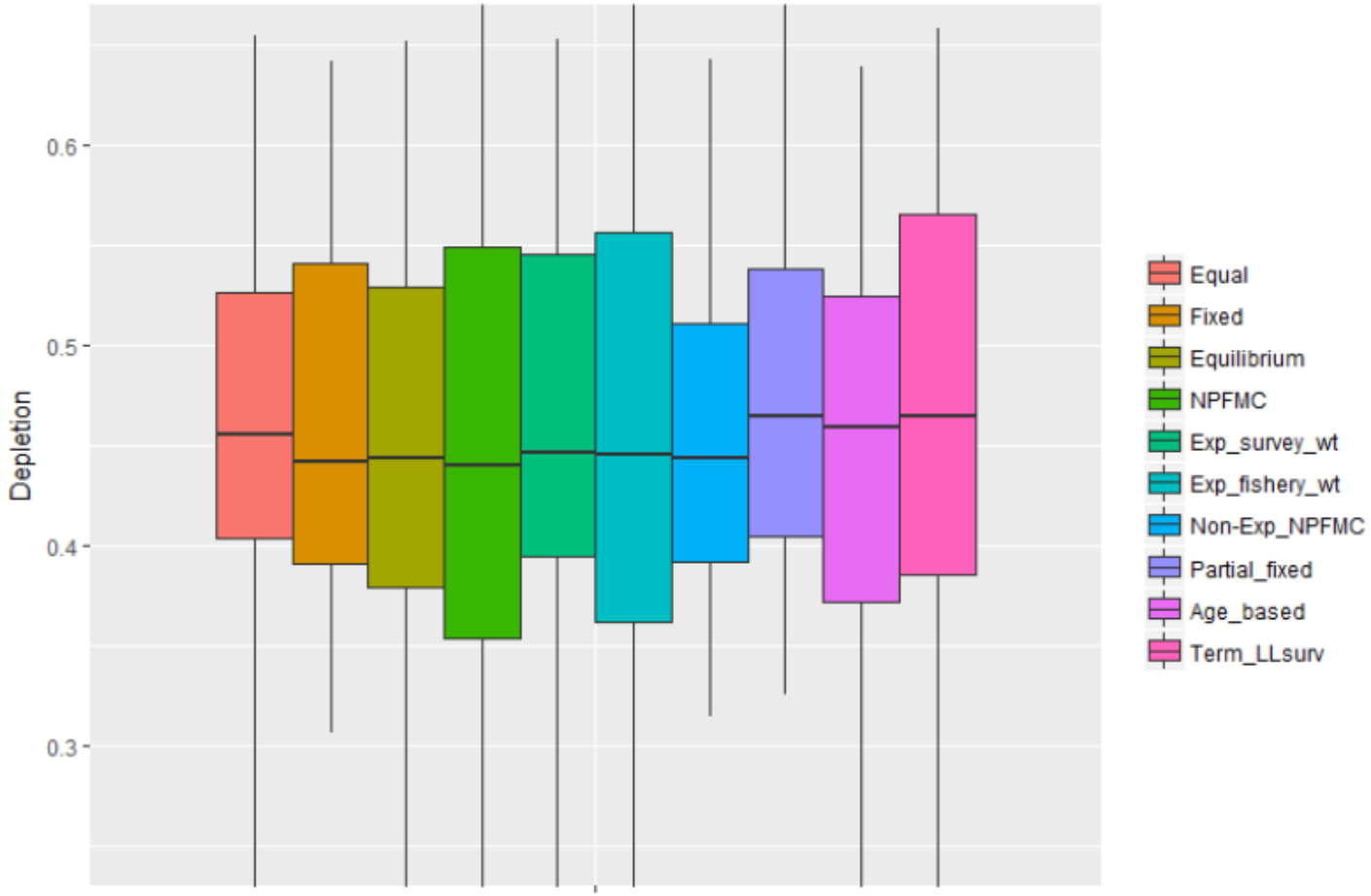
- Given that ABC apportionments are typically based on conservation concerns, does combining OFL take away these precautions?
  - ABCs would still be apportioned by area
  - Sablefish are currently on PSC status (which is a protection)
  - Combining OFL does not raise a biological concern in this instance
  - However, there may be some spatial source-sink dynamics for sablefish, which could have implications for area harvest recommendations
- The Teams recommend that the authors bring forward two alternatives for OFL in November: (1) combine the BS and AI and (2) combine OFL Alaska-wide

Sablefish assessment (7 of 10)

- Kari Fenske reported on preliminary results of her research on apportionment strategies, which was motivated by the fact that percentages have been held constant since the 2013 fishery
- This involves a management strategy evaluation (MSE) consisting of:
  - An estimating model, similar to the assessment model
  - An operating model with 6 areas, movement, area-specific pop. dy.
    - Alternative realizations of the population from the operating model were conditioned on results from the assessment model
  - Ten apportionment strategies
- Preliminary results suggest that the strategies have similar results in terms of depletion and resulting mean age, suggesting that apportionment does not have a negative effect on stock biology
- In November, Kari will evaluate the strategies in terms of sustainability, variability, and economic/yield metrics

Sablefish assessment (8 of 10)

- SB_{2029}/SB_{1977} (results are preliminary, for illustrative purposes only)



Sablefish assessment (9 of 10)

- Discussion of recruitment variability in the MSE:
  - Q: The 2014 year class was reduced by 2/3 to improve EM convergence and reduce frequency of crashing; would using the full estimate change results?
    - A: Little change in medians, but some change in uncertainty, due to a larger number of non-converging simulations
  - Q: Does σ_R have the same value in both the OM and EM?
    - A: No, because, if σ_R in the OM is the same as in the EM, then extreme recruitment events are more common and the OM does not match current assessment results
  - Q: Can a sensitivity analysis of σ_R be provided in November?
    - A: Dana did a lot of profiling across σ_R when the 2014 cohort first appeared and could present those results again

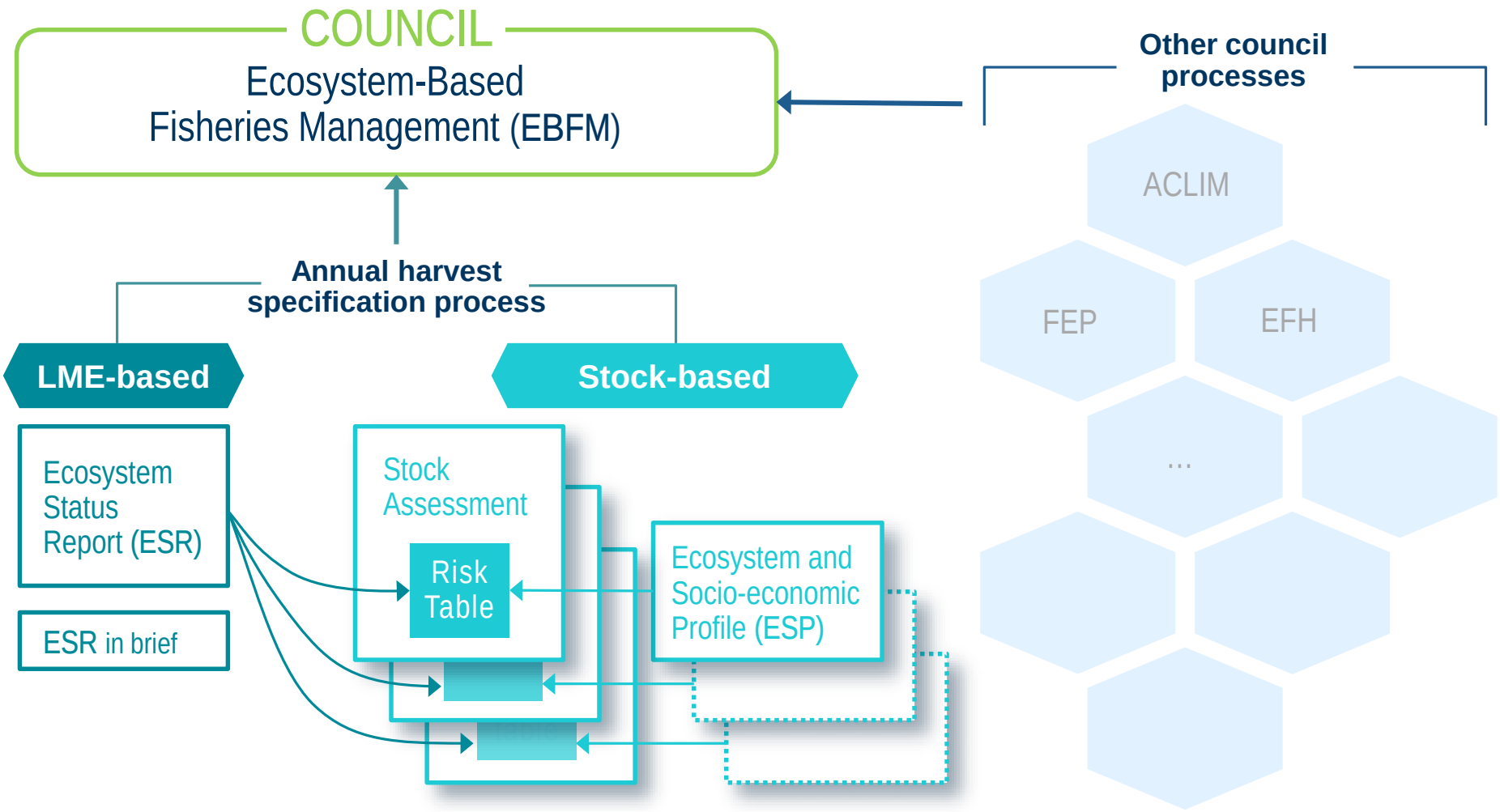
Sablefish assessment (10 of 10)

- Discussion of apportionment considerations:
  - Apportionment can involve socioeconomic concerns in addition to biological ones
  - However, Teams' focus is on biology
  - Socioeconomic considerations would be more appropriately discussed at the SSC or Council level
  - If the biology is not impacted by apportionment, then apportionment could be based on socioeconomic concerns

Risk table (1 of 8)

- Martin Dorn presented an update of the Risk Table (RT), which tracks considerations that can impact an author's ABC recommendation
- RTs were completed by assessment authors in 2018 for BSAI Atka mackerel, EBS and GOA pollock, sablefish, and GOA P. cod; and by the BSAI Team for EBS P. cod
- In December 2018, the SSC recommended:
  - Adding a column that addresses fishery behavior and performance
  - Completion of RTs by all authors in 2019, later clarified to mean all full assessments in 2019 (SSC minutes, 6/19)
  - Authors and Teams do not have to recommend specific reductions
- Martin presented a flow chart, revised RT template, example use of the new column, and list of recommendations for assessment authors

Risk table (2 of 8)

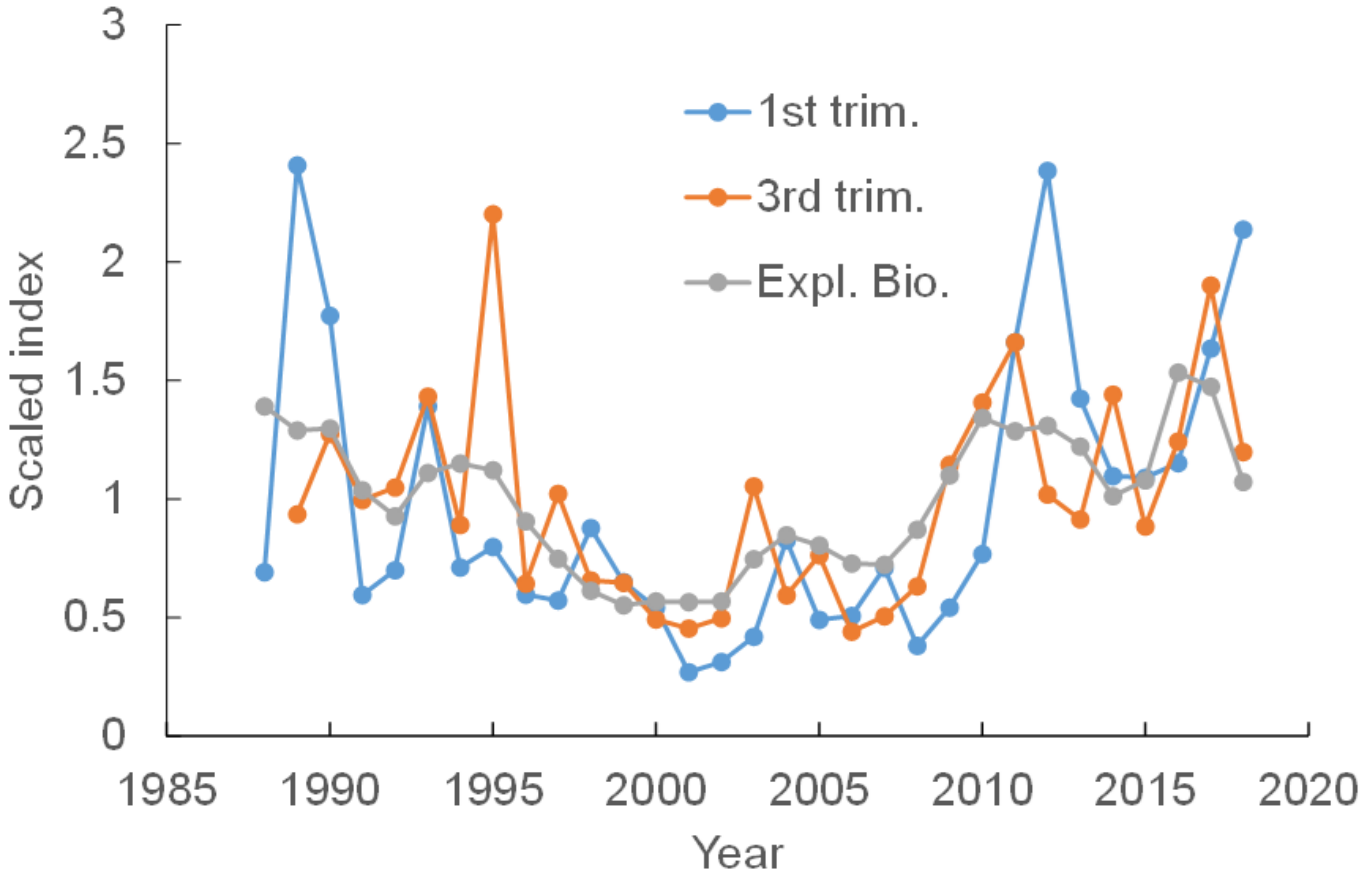


Risk table (3 of 8)

	Assessment-related Considerations	Population dynamics Considerations	Ecosystem Considerations	Fishery Performance 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 and/or ecosystem concerns	No apparent fishery/resource-use performance and/or behavior 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 adverse signals for the stock, but the pattern is not consistent across all indicators.	Some indicators showing 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 as the stock, and/or b) up or down trophic levels from the stock	Multiple indicators showing consistent adverse signals a) across different sectors, and/or b) different gear types
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 ever seen previously, or 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	Extreme anomalies in multiple performance indicators that are highly likely to impact the stock.

Risk table (4 of 8)

- Fishery behavior and performance (GOA pollock: CPUE and biomass)



Risk table (5 of 8)

- Recommended 2019 process for ecosystem considerations column:
  - Authors can either work independently to assemble ecosystem information, or work collaboratively with a designated POC
  - Use the POC table to identify the ecosystem expert assigned to help with risk table (Ebett, Steph, Ellen, Kalei)
  - Set up a meeting (ideally face-to-face) with the ecosystem POC in late September to early October to plan a way forward
  - POC (and others as needed) will assist in writing a short paragraph and bullets for the ecosystem considerations column
  - Scoring for this column can be a collaborative endeavor
    - Aim for consensus if possible, but assessment author is ultimately responsible for recommendations

Risk table (6 of 8)

- Grant Thompson presented some ideas for further systematization, to:
  - Reduce ambiguity
  - Standardize formatting and language across columns
  - Adopt “concern” as the common currency
  - Avoid double-counting
  - In general, increase the odds that authors will interpret RT similarly
- For each column, the following were distilled from the current template:
  - A pair of metrics to be applied
    - Can be interpreted broadly or supplemented, in the event that an author truly believes that additional metrics are required
  - A standard against which the metrics are to be compared
  - A pair of examples for each of the two metrics (not an exclusive list)

Risk table (7 of 8)

- Proposed systematization

Consideration	Standard	Metric	Examples (not necessarily exclusive)
Assessment	similar assessments	1. assessment uncertainty	1a. within-model uncertainty 1b. between-model uncertainty
		2. other assessment issues	2a. lack of fit to data 2b. retrospective pattern
Population dynamics	long-term patterns	1. abundance	1a. recent trend (up, down) 1b. recent values (relative to average)
		2. recruitment	2a. recent trend (up, down) 2b. recent values (relative to average)
Ecosystem	long-term patterns	1. ecosystem indicators that likely relate directly to the stock/complex	1a. recruitment covariates 1b. mortality covariates
		2. other ecosystem indicators	2a. within same trophic level as the stock 2b. within other trophic levels
Fishery/resource performance/behavior	long-term patterns	1. commmercial fishery CPUE	1a. recent trend (up, down) 1b. recent values (relative to average)
		2. local/traditional knowledge of resource condition or behavior	2a. resource condition 2b. resource behavior

Risk table (8 of 8)

- Suggested mapping of metrics into risk levels:

Level	Criterion
1: Typical	Each metric results in a level of concern that is typical, relative to the standard
2: Elevated	At least one metric results in a level of concern that is elevated, relative to the standard
3: High	At least one metric results in a level of concern that is high, relative to the standard
4: Extreme	At least one metric results in a level of concern that is extreme, relative to the standard

- Use of “at least one” terminology was intended to be consistent with current process of equating overall risk with the most extreme value
- However, not all Team members liked this idea, and Grant stressed that it was just a suggestion (not a necessary component of the proposal)
- Some Team members felt that the proposal could help some authors this year; others felt that it needed to be adopted by either all or none
- The Teams recommend that each author have discretion to use the proposed systematization presented here as a tool to assist them in filling out the risk table