



NOAA
FISHERIES
NPFMC

Discussion Paper:

Stock Assessment

Prioritization: Methods

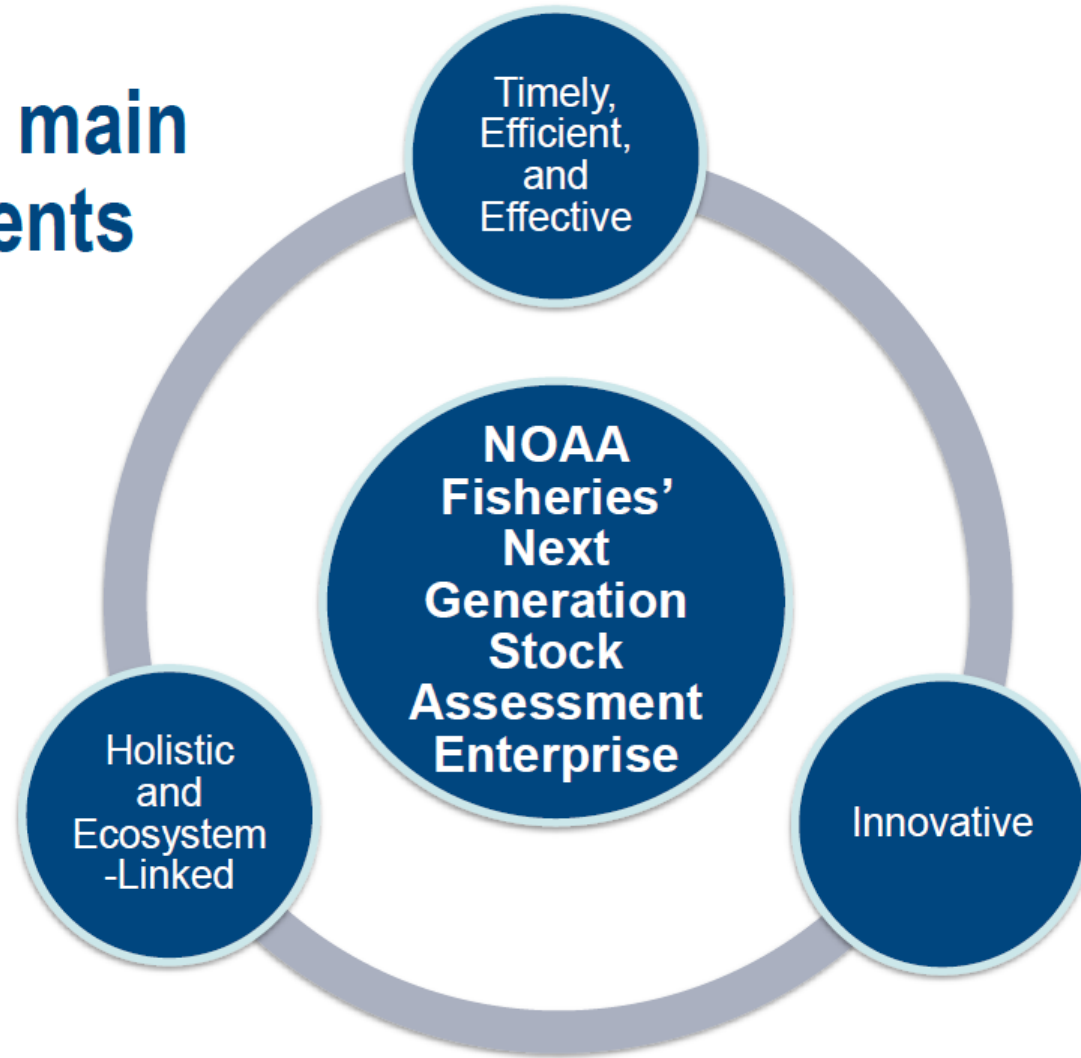
and Scenarios

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Dana Hanselman, Jon Heifetz, Stephen Kasperski, Kalei Shotwell

Crab Plan Team Review
September 2016

Overview

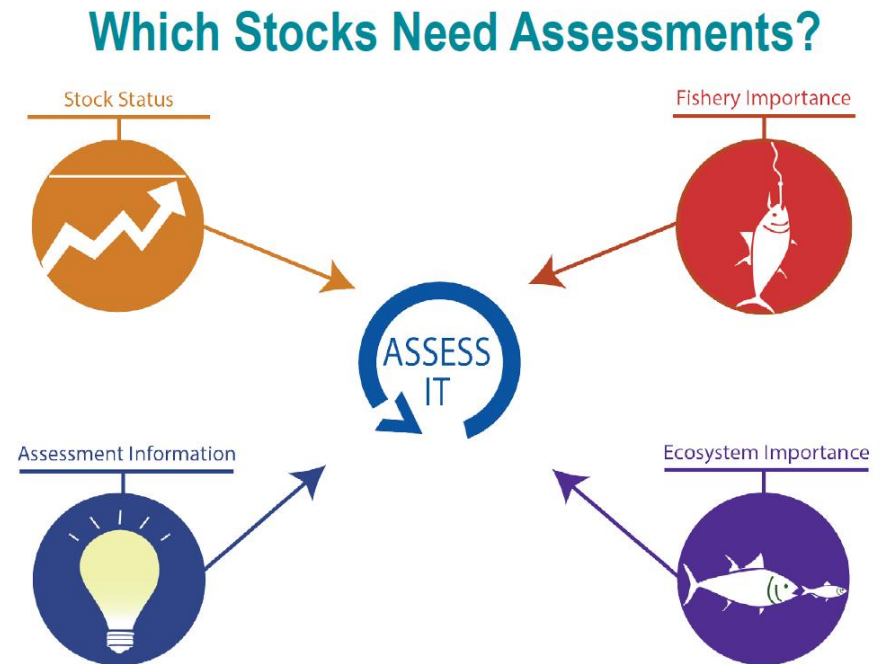
- **NGSA: 3 main components**



Next Generation Stock Assessments

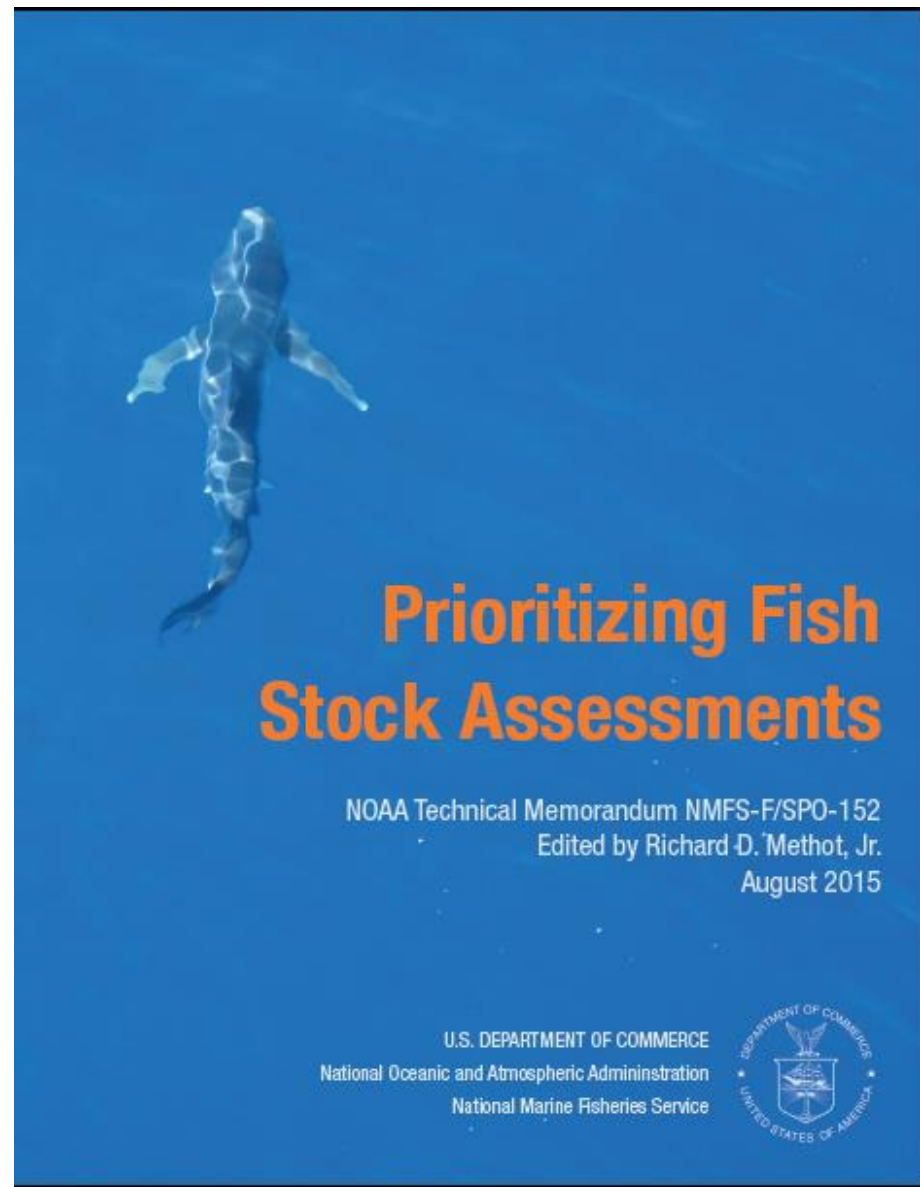
Timely, Efficient, and Effective

- Use new categorization system and prioritization protocol to plan assessments and conduct gap analyses.
- Facilitate standardized models yet maintain research and development
- Enhance peer reviews
- Improve communication



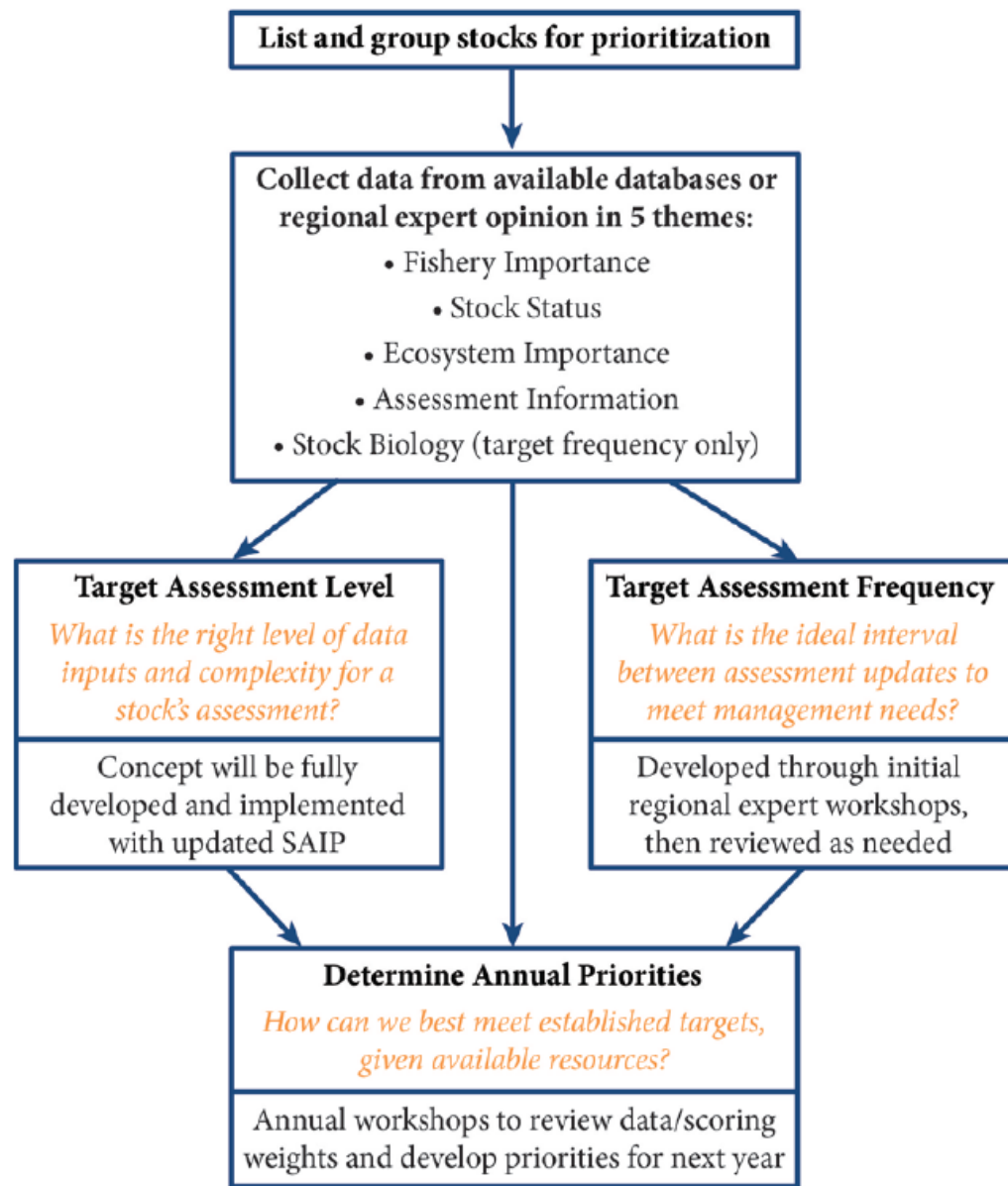
Time Line

- 2011: Initiate development to respond to budget inquiries
- 2013: Prioritization needs discussed in proposed Magnuson – Stevens Act reauthorization
- Feb 2014: Draft process presented to Council Coordination Committee and available for public comment
- Jun 2014: Public comments summarized for CCC
- Sep 2014: Government Accountability Office report endorses plan
- Jun 2015: Process revised based on comments and presented to CCC
- Aug 2015: Prioritization document released



http://www.st.nmfs.noaa.gov/Assets/stock/documents/PrioritizingFishStockAssessments_FinalWeb.pdf

Regional Assessment Prioritization



National Proposal for Prioritization Scoring

Category	Factor	Source	Scores	Potential Weight Range
Fishery Importance	Commercial	Calculated as in Equation 1	0-5	0-40
	Recreational	Expert opinion	0-5	0-40
	Subsistence	Expert opinion	0-5	0-20
	Rebuilding Status	National database	0-1	0-20
	Constituent Demand	Expert opinion	0-5	5-25
	Non-catch Value	Expert opinion	0-5	0-20
Stock Status	Stock Abundance	SSB/SSB_{MSY}	1-5	5-25
	Fishing Mortality	F/F_{MSY}	1-5	5-25
Ecosystem	Role in Ecosystem	Expert opinion; maximum of bottom-up and top-down components	0-5	0-20
Assessment Factors	Unexpected Changes in Stock Indicators	Expert opinion, where indicators are available	0-5	5-25
	New Type of Information	Expert opinion	0-5	5-25
	Years Assessment is Overdue	Calculated based on target frequency	0-10	10-30

NPFMC Fishery Importance (Kasperski – Lead)

- Sent surveys to 12 experts representing economists and fishery managers from AFSC, NPFMC and AKRO + Assessment Authors.
- Two questions:
 - Provide score for fishery importance for recreational, subsistence, constituent demand, and non-catch value. Assigned a number: “Not at all” = 0, “A little” = 1; “Somewhat” = 3, “Very” = 5
 - Provide degree of confidence in those scores on same scale.
- Commercial fishery importance based on average revenue 2012-2014

$$stock\ x = \frac{\log_{10}(1 + \text{revenue from stock } x)}{\log_{10}(1 + \text{revenue from highest value regional stock})} * 5$$

- Weighted Average of experts using degree of confidence in their response as the weights. See Table 2 in Discussion Paper

Crab Fishery Importance Scores

Stock	Commercial Index	Constituent Demand Index	Non-Catch Value Index	Recreational Index	Subsistence Index	Total Fishery Importance Score	Total Rank
Pribilof Islands Blue King Crab	0.00	2.95	2.28	0.08	0.47	5.78	71
St. Matthew Island Blue King Crab	3.72	3.88	2.14	0.03	1.32	11.09	21
Pribilof Islands Golden King Crab	2.92	3.57	1.76	0.00	0.53	8.78	43
Aleutian Islands Golden King Crab	4.27	4.25	2.42	0.04	0.58	11.56	18
Bristol Bay Red King Crab	4.51	5.00	2.78	1.10	2.74	16.14	1
Norton Sound Red King Crab	3.70	4.18	1.94	2.20	3.84	15.86	2
Pribilof Islands Red King Crab	0.00	2.61	1.59	0.31	0.96	5.48	72
Western Aleutian Islands Red King Crab	0.00	2.76	1.70	0.19	0.50	5.15	73
Bering Sea Snow Crab	4.76	4.48	2.17	0.34	1.17	12.92	11
Arctic Management Area Snow Crab	0.00	1.50	3.09	0.00	0.38	4.97	74
Bering Sea Southern Tanner Crab	4.06	4.43	2.03	0.03	0.77	11.33	19

Note: this does not include rebuilding status in the total fishery importance score

Species Importance Data (Shotwell & Blackhart Leads)

- Surveyed AFSC lead stock assessment authors
- Target Frequency components: mean age; stock variability; fishery importance; ecosystem importance.
- Recruitment Variability: -1 yr CV > 0.9; + 1 yr CV < 0.3
- Ecosystem importance
 - Maximum score of top down (1 – 5) and bottom up (1-5) components.
 - Standardized by averaging author scores with Regional Ecosystem Expert score (Kerim Aydin)

Target Frequency (Mean Age)

Derived from mean catch-at-age or its proxy

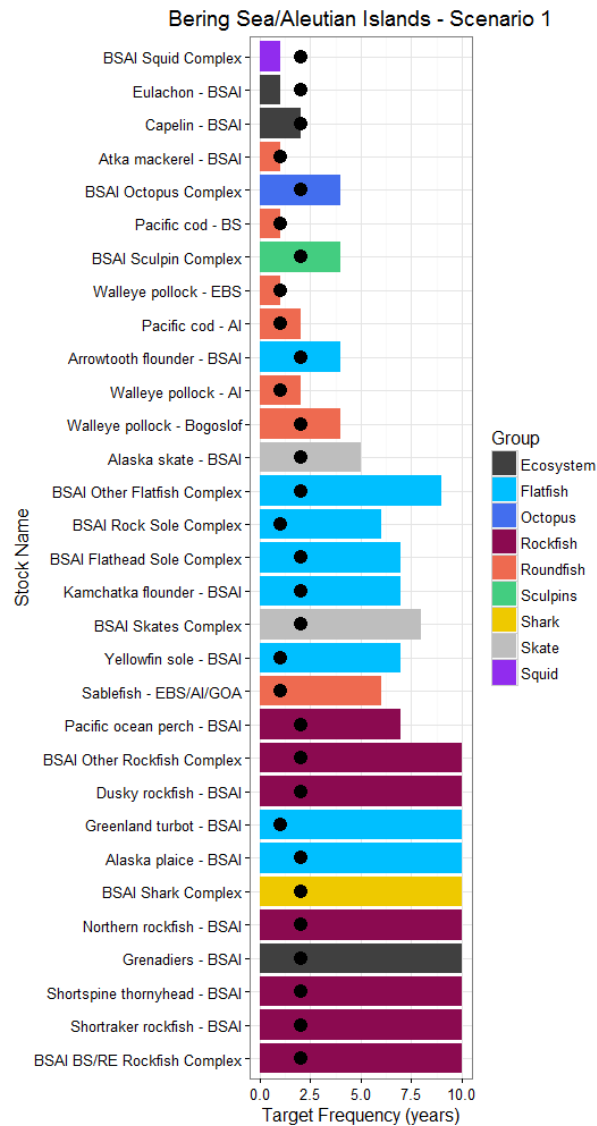
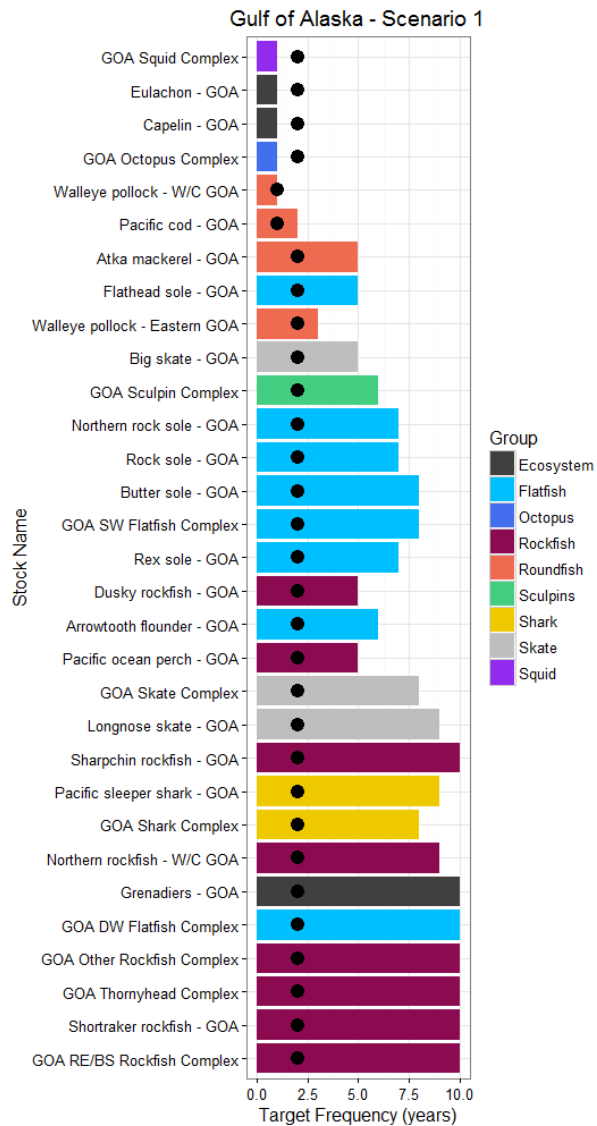
1. Mean catch age (if available) (32%)
2. If not 1, then mean survey age: converted to mean fishery age based on stocks where fishery age and survey age available. (28%)
3. If not 1 & 2, then Fishery age was estimated by converting Z to fishery age using simple exponential decay (5%)
4. If not 1-3, then convert to Z using estimate of F (35%, see Figure 1)

$$Z = M + (catch/OFL * M)$$

Scenarios

- **Status Quo:** Current assessment frequencies, annual and biennial schedule for all groundfish stocks
- **Scenario 1 (S1):** This scenario was the “Base Case” recommended in Methot (2015): Target Frequency (p) $p = \text{mean age} * \lambda$ (used default $\lambda = 0.5$). Then p was adjusted upward or downward for: ± 1 yr recruitment variability, ± 1 yr fishery importance, ± 1 yr ecosystem importance. In this scenario, p is capped at a maximum value of 10 years and a minimum value of 1 year.
- **Scenario 2 (S2):** Base Case (S1) with a maximum cap at 5 years.
- **Scenario 3 (S3):** S2 with fishery importance adjustment of ± 2 years (using -2, -1, 0, 1, 2 based on quintiles of the fishery importance score)
- **Scenario 4 (S4):** S2 with regional scalar adjusted so that high commercial value stocks would be annual.
 - Total ex-vessel value of all the groundfish stocks sorted.
 - “Highest Value Stocks (HVS)” = top 75% of the cumulative catch value (EBS pollock, BS Pacific cod, AK sablefish, and BSAI yellowfin sole).
 - λ set to make sure that the target frequency was annual “HVS” after having applied the standard adjustments (± 1 fishery, ± 1 ecosystem, ± 1 recruitment). $\lambda = 0.139$.
- **Scenario 5 (S5):** Combination of S3 and S4, fishery adjustment of ± 2 years with the regional scalar according to the high value stocks applied after taking adjustments into account. This resulted in a regional scalar of 0.209.

Status Quo (black dots) & Scenario 1 $\lambda = .5$



Proposed Groundfish Time Line

- Plan Team Review and comment
- Proposed January GPT workshop on SAPP
- February SSC and NPFMC review and comment
- Revise as necessary
- Spring/Summer 2017 adopt new Target Frequency schedule.

Issues & questions for CPT

- Should the crab stocks be included in this process?
 - Requires ADF&G authors to complete species importance scoring and rebuilding status
- Does CPT agree that primary focus should for NPFMC should be Target Frequency?
- Does CPT have a preferred scenario? Or recommendations for alternatives?
- How should criteria for out of cycle assessments be established?

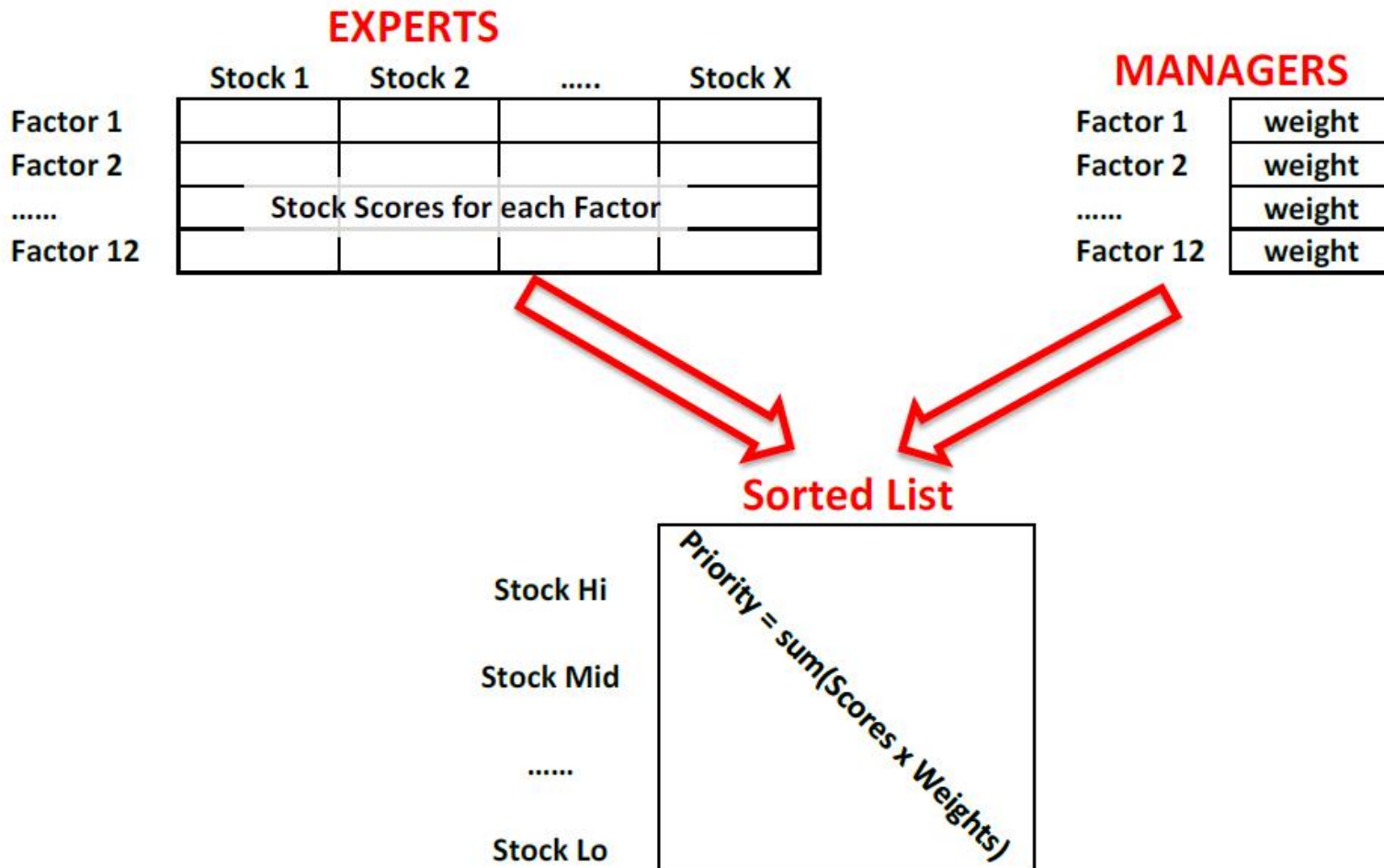
Questions?

Thanks to:

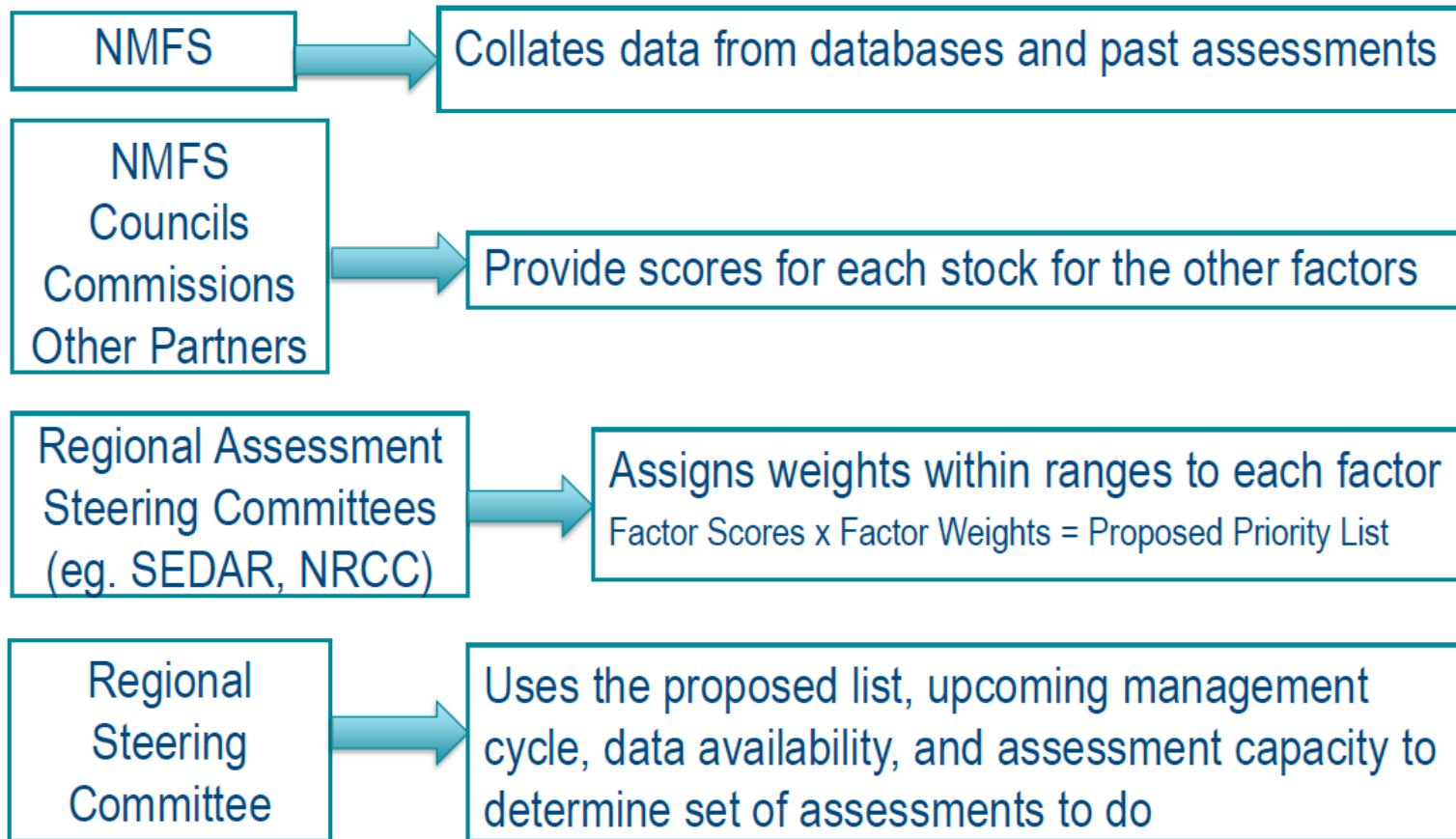
Rachael Baker, Steve Barbeaux, Michael Dalton, Elizabeth Conners, Katy Echave, Ben Fissel, Brian Garber-Yonts, Jason Gasper, Alan Haynie, Pete Hulson, Jim Ianelli, Jean Lee, Dan Lew, Niels Leuthold, Sandra Lowe, Chris Lunsford, Carey McGilliard, Glenn Merrill, Chris Oliver, Olav Ormseth, Cara Rodgveller, Chang Seung, Paul Spencer, Ingrid Spies, William Stockhausen, Grant Thompson, Cindy Tribuzio, Jack Turnock, Tom Wilderbuer, David Witherell, Ellen Yasumiishi.



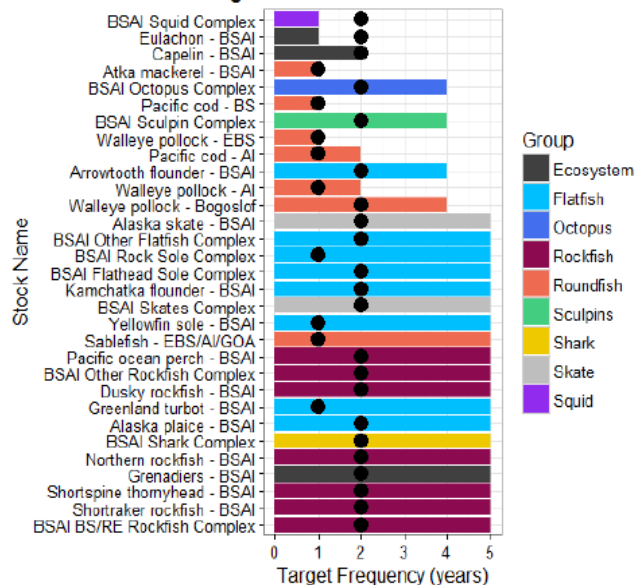
How Will It Work?



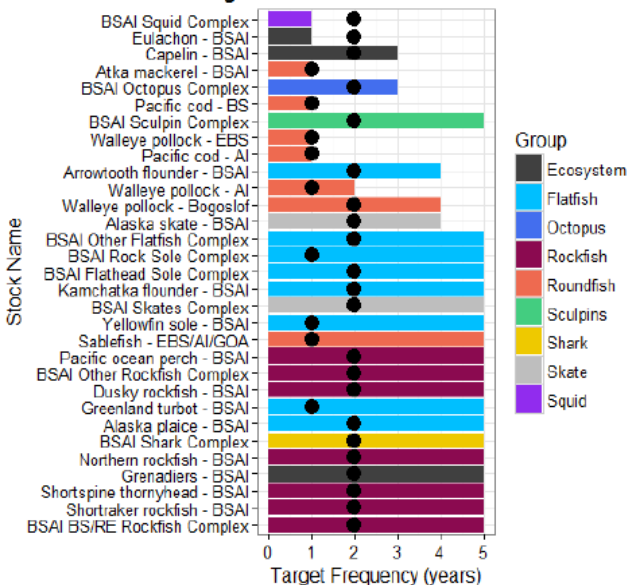
Roles in Prioritization Process



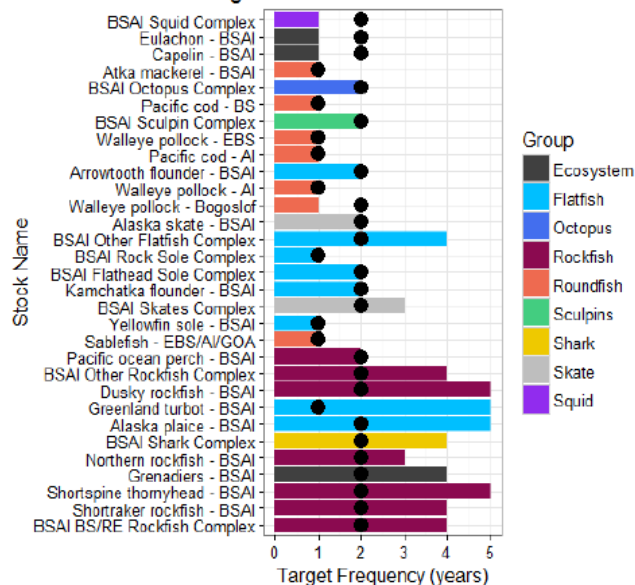
Bering Sea/Aleutian Islands - Scenario 2



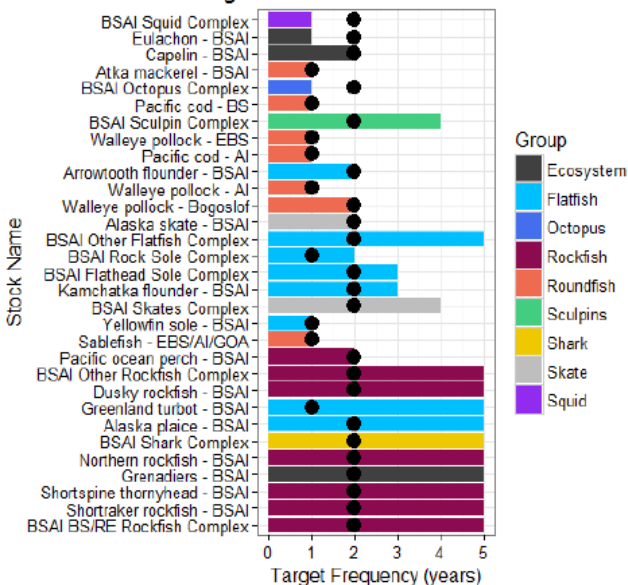
Bering Sea/Aleutian Islands - Scenario 3



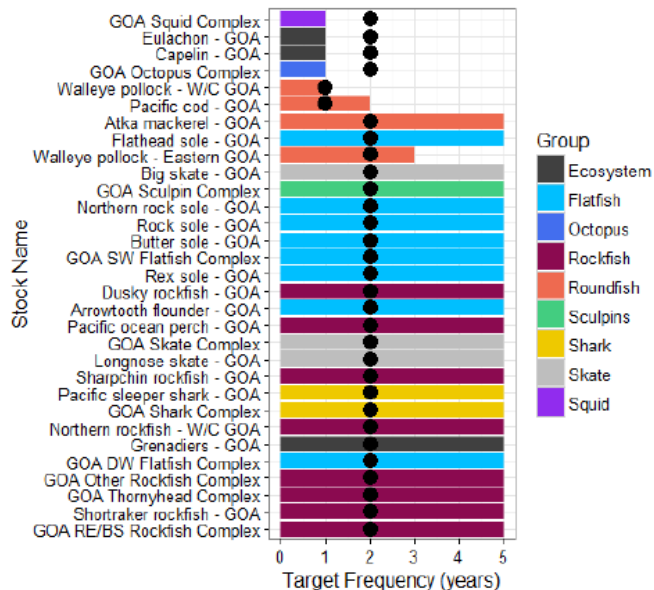
Bering Sea/Aleutian Islands - Scenario 4



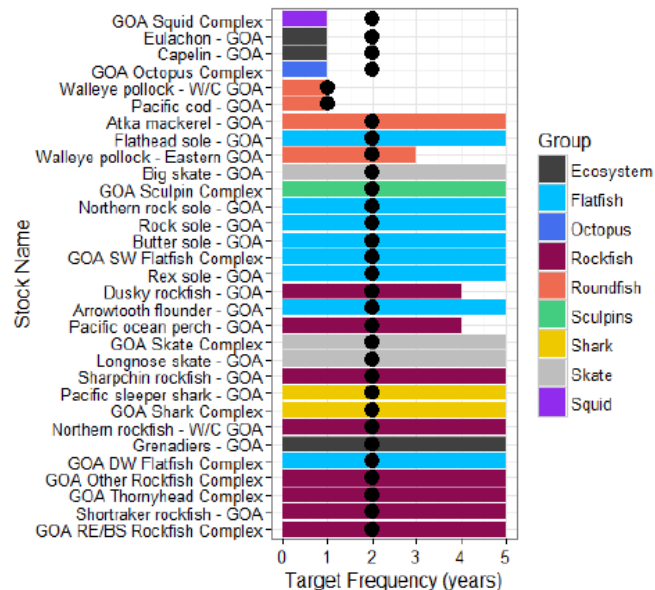
Bering Sea/Aleutian Islands - Scenario 5



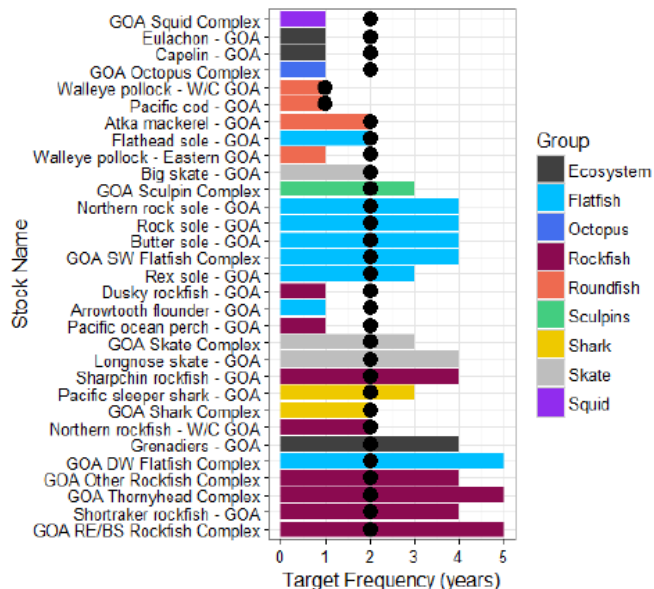
Gulf of Alaska - Scenario 2



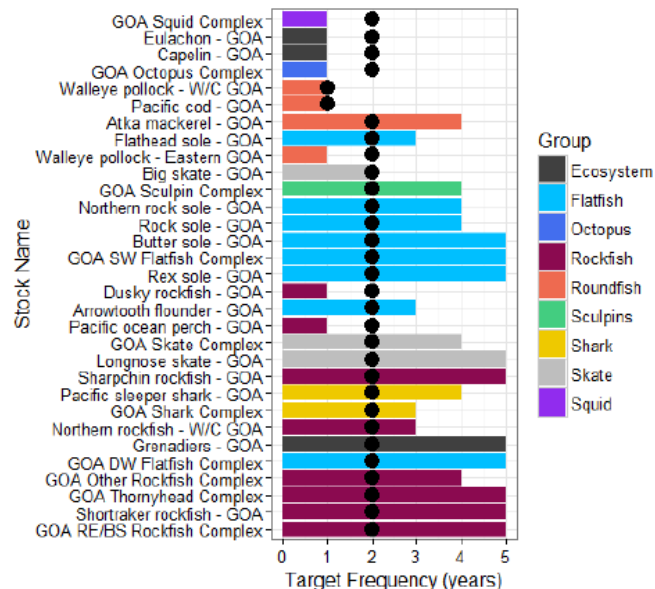
Gulf of Alaska - Scenario 3



Gulf of Alaska - Scenario 4



Gulf of Alaska - Scenario 5



Future Issues & questions for GPT

- Does GPT agree that primary focus should for NPFMC should be Target Frequency?
- Does GPT have a preferred scenario?
- Are there alternative scenarios that the GPT recommends?
- Does GPT agree that once a Target Frequency is adopted that annual prioritization updates are not needed? If so, how often should Target Frequency be reviewed?
- How should criteria for out of cycle assessments be established? (GPT work group; Author's expert opinion?)
- How should impacts of altering the assessment cycle be evaluated? – qualitative or quantitative (see appendix for possible MSE).