# Application of Stock prioritization process to BSAI Crab stocks

NPFMC Crab Plan Team

September 2016

- Received overview presentation of both National initiative as well as how it is being applied to BSAI and GOA groundfish stocks
- CPT discussion that the modeling process being pursued for groundfish is not applicable for crab stocks
  - Data availability is not equivalent for crab as for groundfish (e.g., age-date, S/R, ..)
- CPT designates sub-group (NPFMC, AFSC, ADFG, UAF) to draft a qualitative process for BSAI Crab for presentation/finalization at January 2017 CPT meeting

Broad categories consistent with National prioritization themes
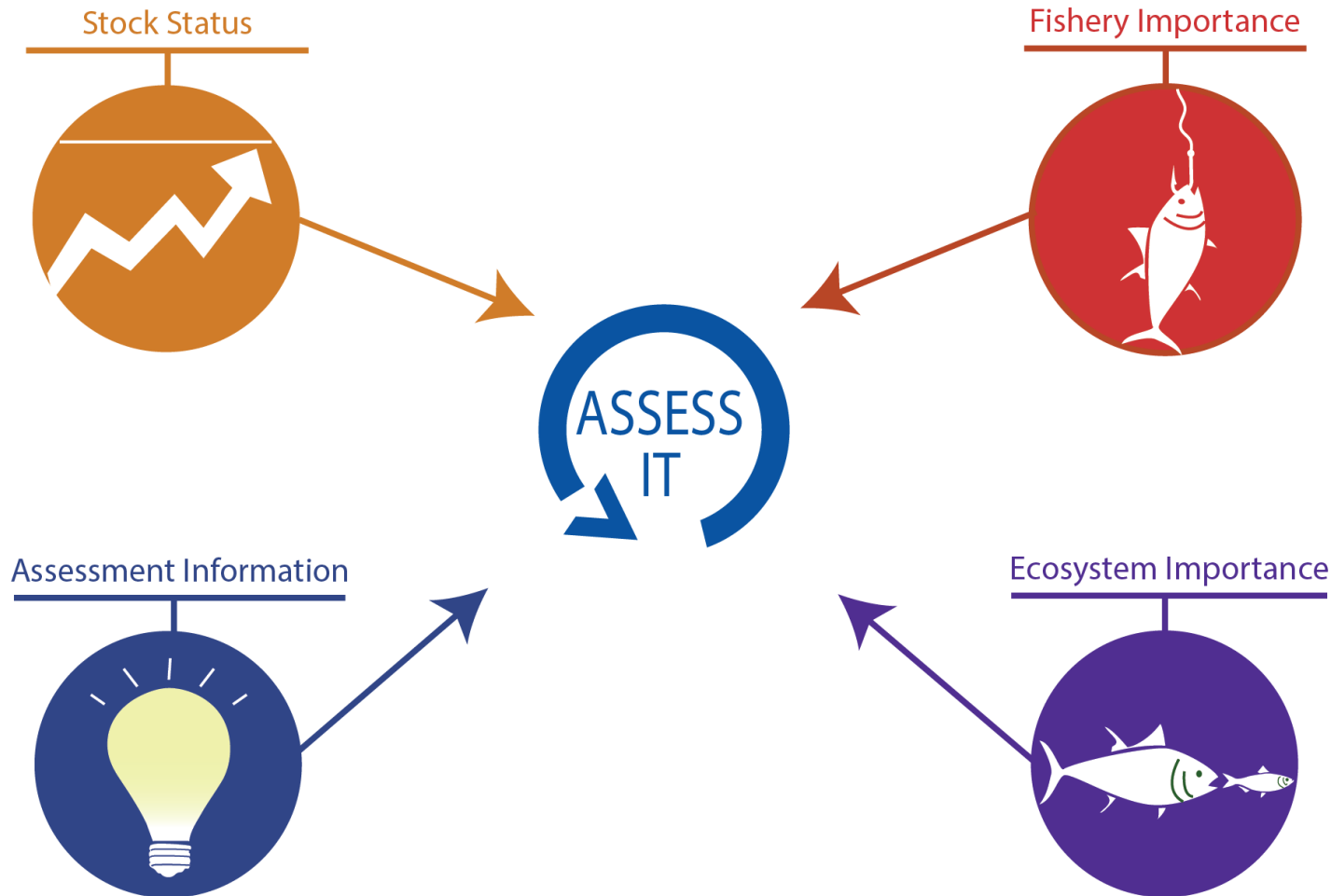
- Modified the factors for each category to be specific to crab

Fishery Importance

Commercial importance
- relative value wrt most valuable regional stock (EBS pollock)
- High score = > comm. imp

Constituent demand
- Level of demand by stakeholders for stock assessment or evaluation
- High score = high demand (catch share, controversial, > socio-cultural)

Subsistence/CDQ
- Significance wrt subsistence or CDQ

Rebuilding status
- B/B_{MSY}
- high score = overfished/overfishing

Stock Status

Stock Abundance
- High score: $> B_{MSY}$
- Medium:= B_{MSY}
- Low: $< B_{MSY}$

Stock Variability
- Variability in recruitment, abundance and fishing or natural mortality
- High score = high variability, low score little to no variability

Fishing Mortality
- Level of targeting
- High score = higher level of directed targeting
- Low score = low level of targeting

Ecosystem Importance

Role in the Ecosystem

- Importance to the overall health and functioning of the ecosystem
- While important, determined that not informative to distinguish between crab stocks
- All stocks rated equally

Assessment Factors (2 of 4)

Unexpected changes in stock indicators

- How accurate and precise are model predictions relative to introduction of new data
- High score = poor match to new data,
- high deviations from past predictions

Model maturity

- Level of development and confidence in model performance
- High score = need to continue with model development

Assessment Factors (4 of 4)

New types of information

- Information entering the assessment
- High score = new informative data provided in near-term

Survey frequency

- Survey frequency AND data streams to assessment
- High score = annual survey + an additional data stream
- Middle = annual survey only
- Low = infrequent survey or no survey, limited data stream

Category	Factor	Importance: 3 High; 2 medium; 1 low									
		BBRKC	Snow	Tanner	PIRKC	PIBKC	SMBKC	NSRKC	AIGKC	PIGKC	WAIRKC
Fishery Importance	Commercial	3	3	3	1	1	2	2	3	1	1
	Constituent demand	3	3	3	2	1	2	3	3	1	2
	Subsistence/CDQ	3	3	3	3	3	2	3	2	1	1
	Rebuilding Status	1	1	1	1	3	1	1	1	1	3
	Stock Variability	3	3	3	3	1	3	1	2	2	1
Stock Status Ecosystem	Stock Abundance	2	2	1	1	3	2	1	2	2	3
	Fishing Mortality	1	1	1	1	2	1	1	1	1	1
	Role in Ecosystem	1	1	1	1	1	1	1	1	1	1
Assessment Factors	Unexpected Changes in Stock Indicators	3	3	3	3	1	3	1	2	1	1
	Model maturity	3	3	3	2	1	3	2	3	1	1
	New Type of Information	2	3	3	1	1	1	1	3	1	1
	Survey frequency	3	3	3	2	2	3	1	1	2	3

$$stock\ x = \frac{log10(1 + revenue\ from\ stock\ x)}{log10(1 + revenue\ from\ \text{h}ighest\ value\ regional\ stock)} * 5$$

Commercial value index

Fishery	REV_INDEX		
	1998-2015	2006-2015	2011-2015
AIG	4.25	4.23	4.26
BBR	4.58	4.58	4.52
BSS	4.66	4.66	4.71
BST	4.03	4.04	4.22
NSR	3.59	3.63	3.68
PIG	3.24	3.08	3.03
PIK	3.78		
SMB	3.88	3.84	3.85
WAI	3.69		
PLK	5.00	5.00	5.00

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	Rebuilding Status	1	1	1	1	3	1	1	1	1	3
	Stock Variability	3	3	3	3	1	3	1	2	2	1
Stock Status Ecosystem	Stock Abundance	2	2	1	1	3	2	1	2	2	3
	Fishing Mortality	1	1	1	1	2	1	1	1	1	1
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	Commercial value index	4.58	4.66	4.03		3.88	3.59	4.25	3.24	3.69	

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		3	3	3	2	1	2	3	3	1	2
		3	3	3	3	3	2	3	2	1	1
		1	1	1	1	3	1	1	1	1	3
		3	3	3	3	1	3	1	2	2	1
		2	2	1	1	3	2	1	2	2	3
		1	1	1	1	2	1	1	1	1	1
		1	1	1	1	1	1	1	1	1	1
		3	3	3	3	1	3	1	2	1	1
		3	3	3	2	1	3	2	3	1	1
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Commercial value index		4.58	4.66	4.03			3.88	3.59	4.25	3.24	3.69

Commercial value index

For comparison:

EBS pollock 5.0
AK Sablefish 4.63
EBS cod 4.72
YFS 4.44
GOA cod 4.45

Resulting target frequency

- Annual
  - Bristol Bay red king Crab
  - Bering Sea Snow Crab
  - Bering Sea Tanner Crab
  - St Matthew blue king crab
  - Aleutian Islands golden king crab
- Biennial
  - Pribilof Islands red king crab
  - Norton Sound red king crab
- Triennial
  - Pribilof Islands blue king crab
  - Pribilof Islands golden king crab
  - Western Aleutian Islands red king crab

Off-years

- No assessment document
- Catch updated in SAFE introduction
- OFL and ABC rolled over from previous year

What would trigger an off-cycle assessment?

- If stock becomes overfished or overfishing is occurring
- New interest in a directed fishery
- Other indication of survey volatility

Revisit prioritization

- CPT recommends that the Crab assessment cycle be revisited in 4 years in conjunction with review of the groundfish target assessment frequency