



Omnibus Risk Policy Framework Adjustment: Meeting 2

Annapolis, MD

December 9, 2019

Presentation Outline

- Overview of risk policy framework
- Review of alternatives
- Review of biological MSE results – Dr. John Wiedenmann
- Review of economic MSE results – Dr. Cyrus Teng
- Staff recommendations
- Meeting outcomes

Current MAFMC Risk Policy

- Policy determination by the Council to specify the acceptable level of risk (i.e., probability of overfishing, P^*)
- Initially adopted in 2011 to comply with 2006 MSA reauthorization
- Works in conjunction with the SSC application of the ABC control rule to account for scientific uncertainty to determine ABC for a specific stock



Risk Policy Framework Development

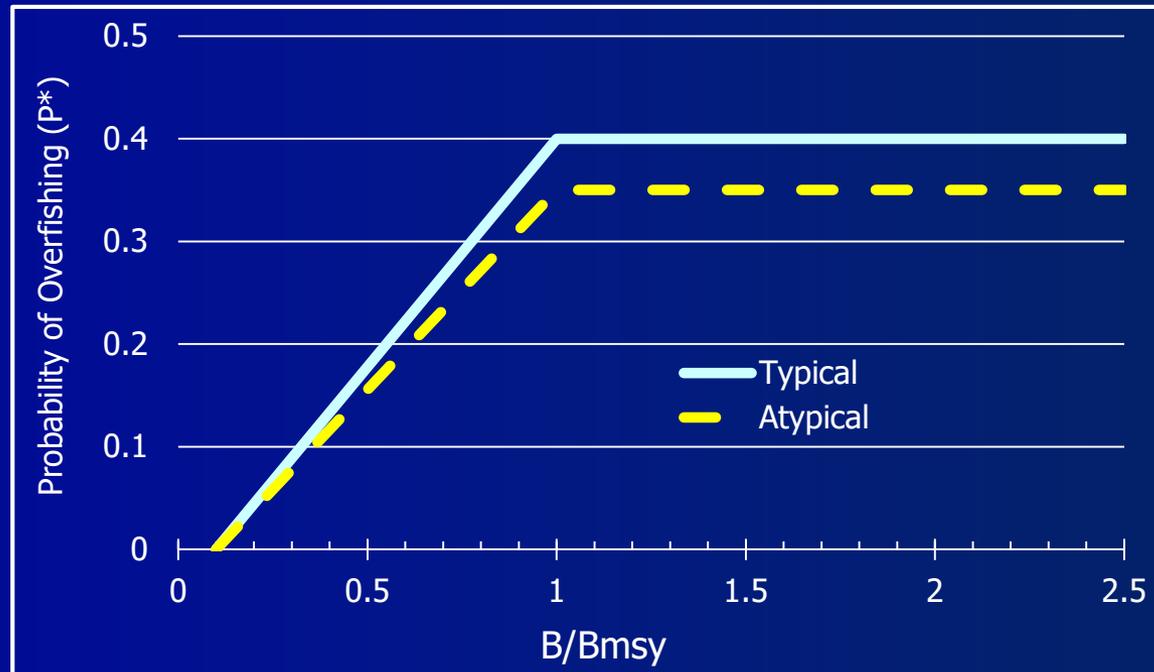
- Council agreed to revisit 5 years after implementation
- Framework meetings and Council discussion throughout 2017 and 2018
- Council expressed interest in more comprehensively considering economic factors (in addition to biological) in evaluating risk policy alt's
- Council agreed to delay framework to allow for development of economic models and evaluation
- Council agreed to reinitiate the framework in 2019 and form a workgroup to develop and analyze alternatives

Risk Policy Alternatives

- All alternatives retain the following:
 - Biologically based foundation – level of risk conditional on current stock biomass
 - Current application of risk policy for stocks under a rebuilding plan
 - At least a 50 probability of achieving F_{REBUILD} (can select something higher)
 - SSC recommends more restrictive ABC (standard application vs. F_{REBUILD})
 - Current application of risk policy for stocks with no OFL (or proxy)
 - Cap on allowable ABC increases until an OFL, or proxy, has been identified

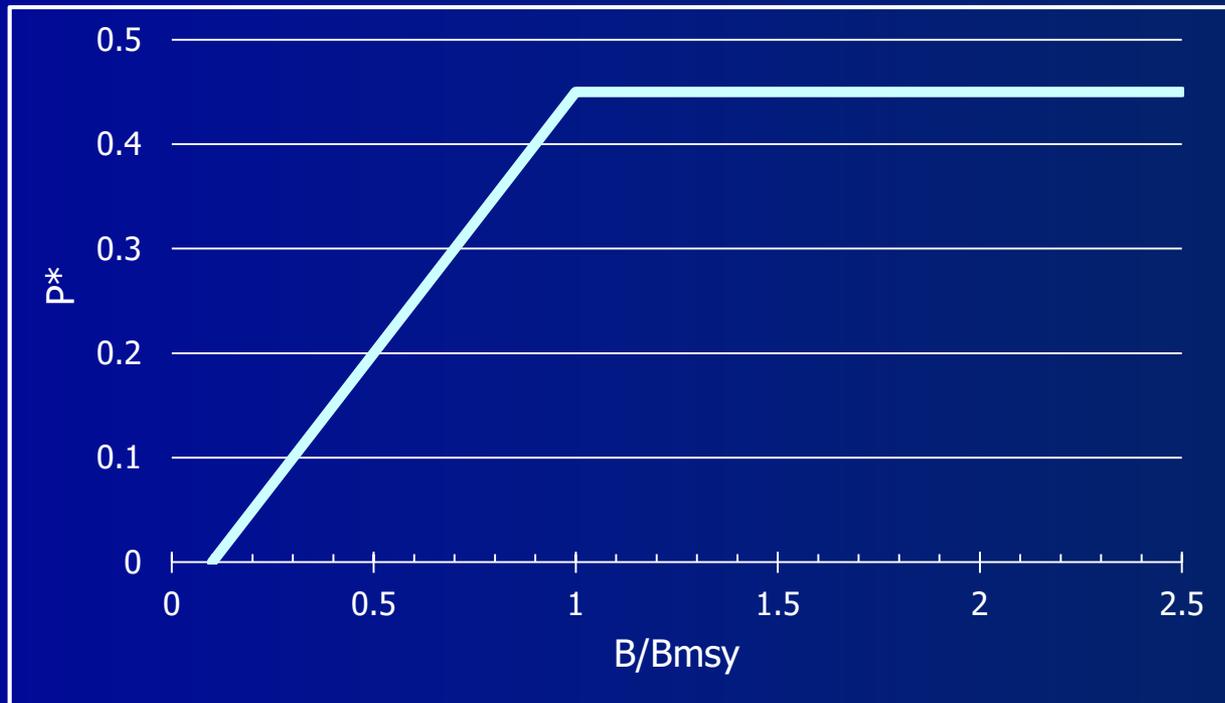
Alternative 1

- *Status quo* – current risk policy
 - Linear increases in risk (P^*) with increasing stock biomass to a maximum P^* of 0.4 when $B/B_{MSY} \geq 1.0$
 - $P^* = 0$ when B/B_{MSY} ratio = 0.1 (stock replenishment threshold)



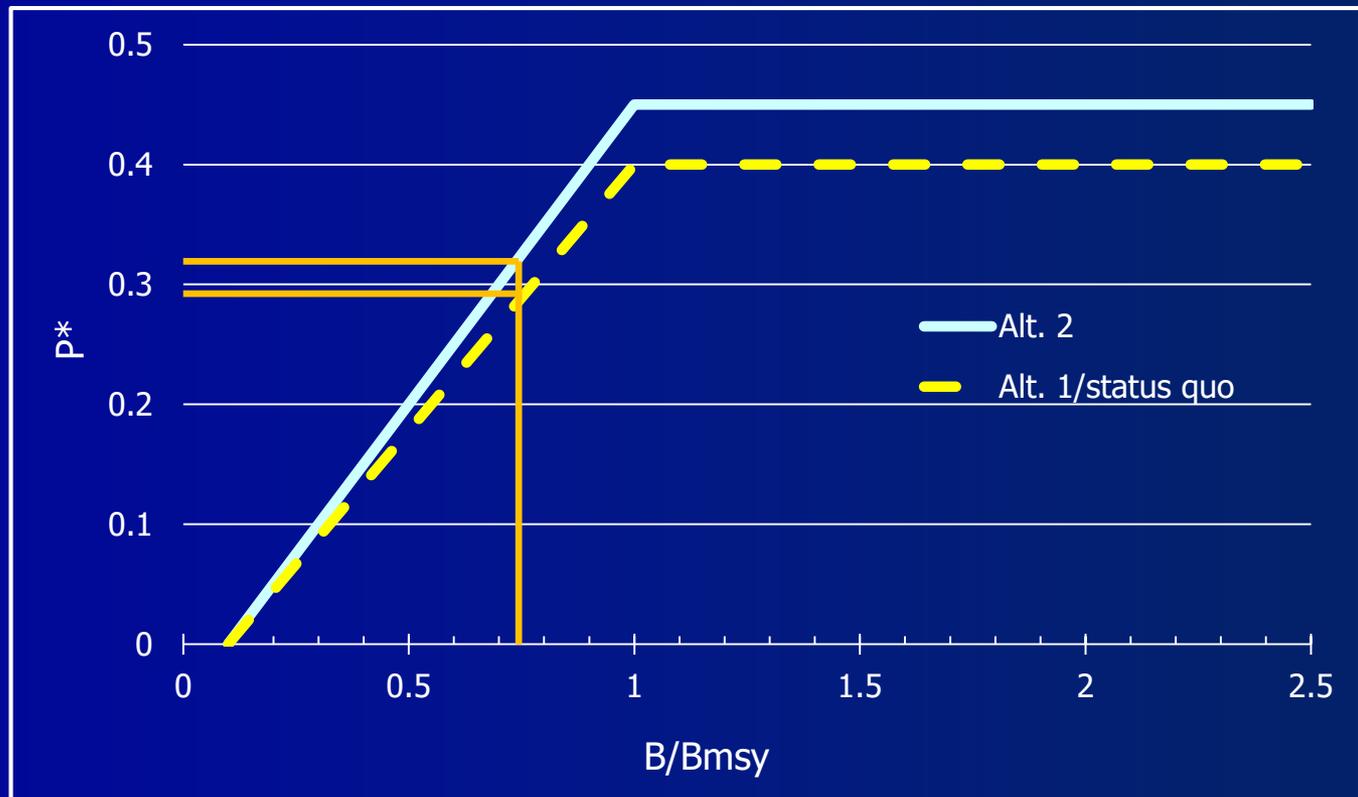
Alternative 2

- Linear increases in P^* with a maximum of 0.45 when $B/B_{MSY} \geq 1.0$
- $P^* = 0$ when B/B_{MSY} ratio = 0.1 (stock replenishment threshold)



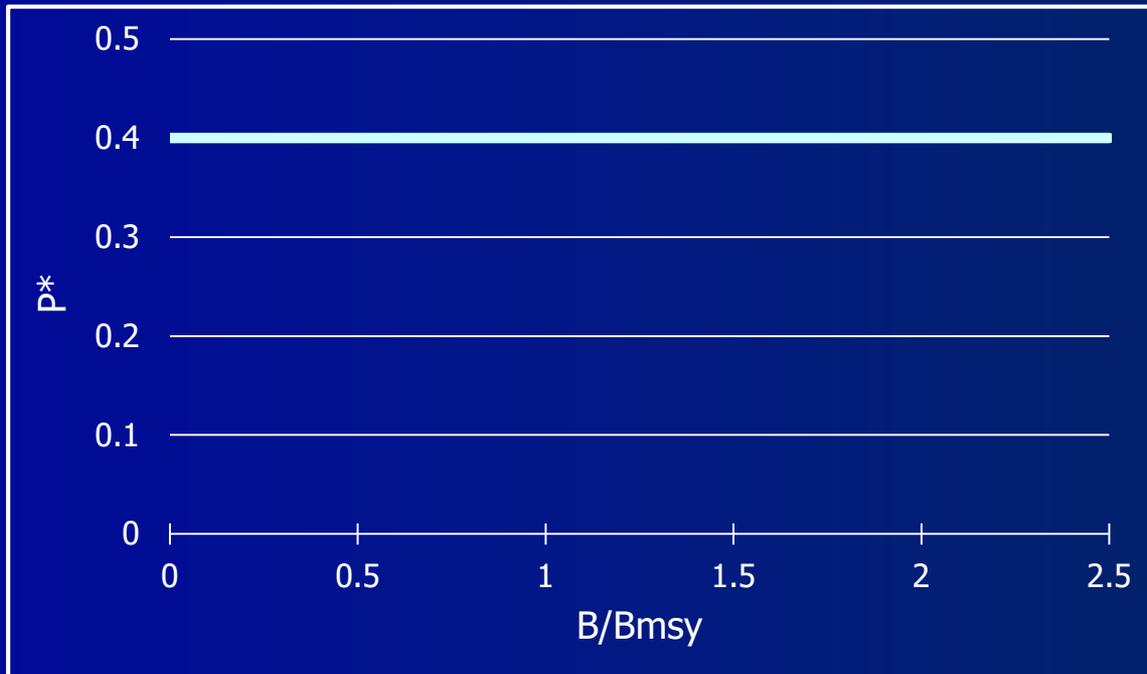
Comparison between Alt's 1 and 2

- Overall assumed higher level of risk
 - Increase in max P^* and higher P^* , under same stock biomass, when less than B_{MSY}



Alternative 3

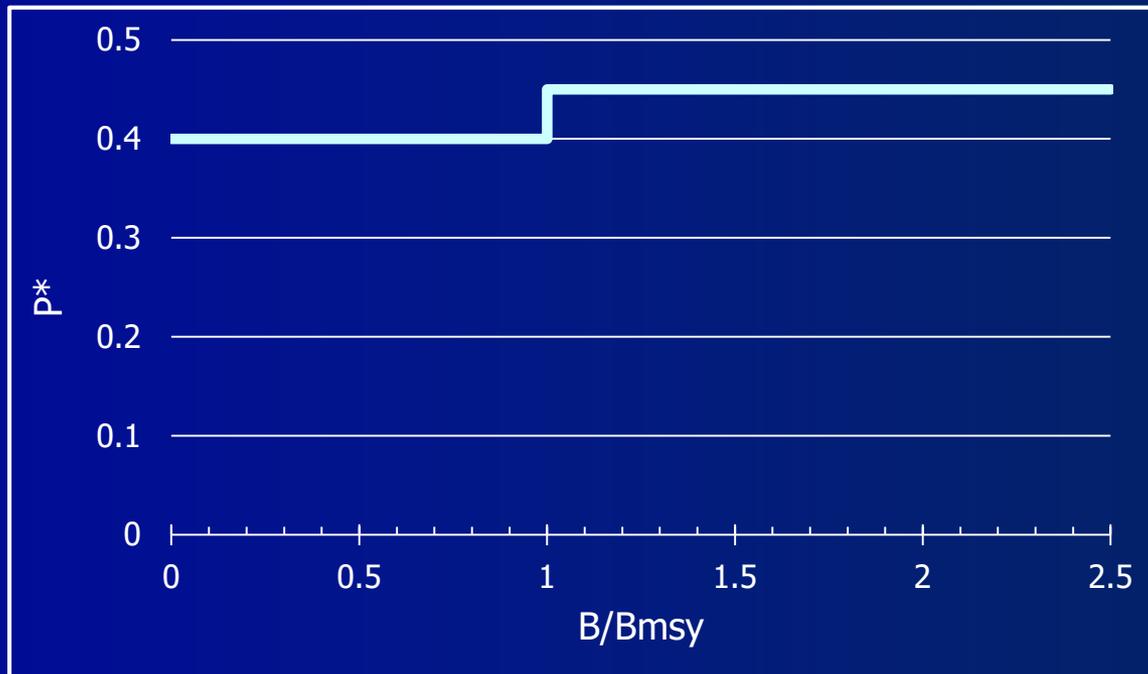
- Constant P^* equal to 0.40 regardless of stock biomass
 - Remove variable P^* as a function of stock size
 - Remove stock replenishment threshold



Alternative 4

■ Two-step P^*

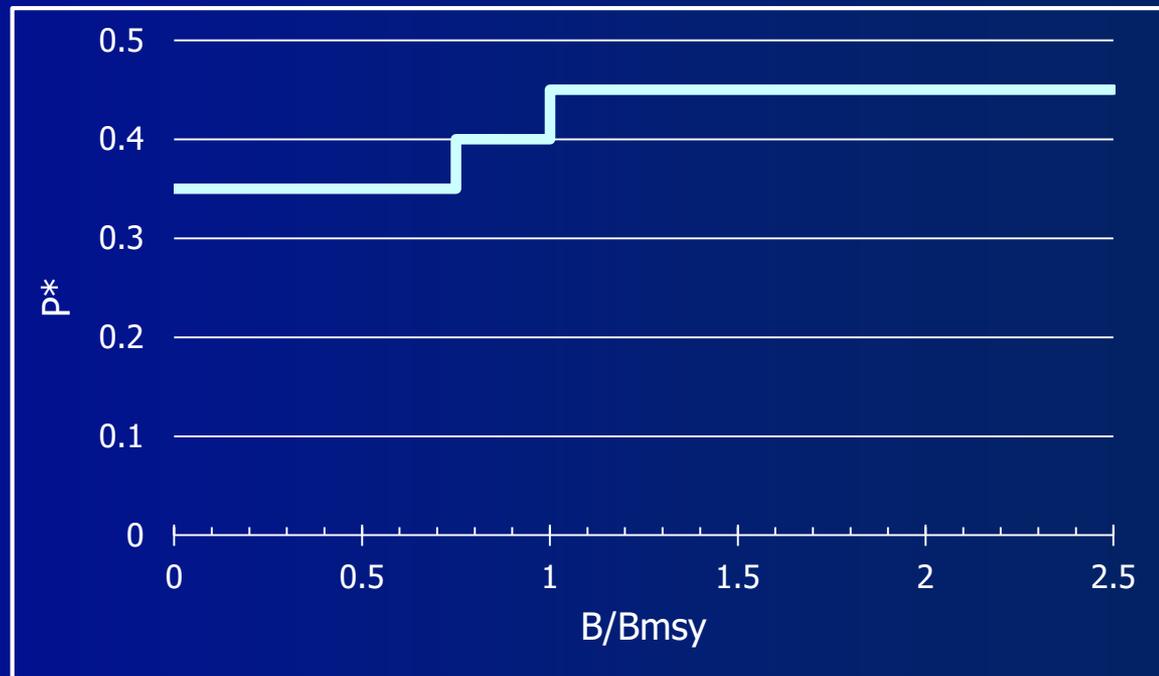
- Constant $P^* = 0.40$ when $B/B_{MSY} < 1.0$; constant $P^* = 0.45$ when $B/B_{MSY} \geq 1.0$
- Some consideration of stock biomass but application of a constant P^*



Draft Alternative 5

■ Three-step P^*

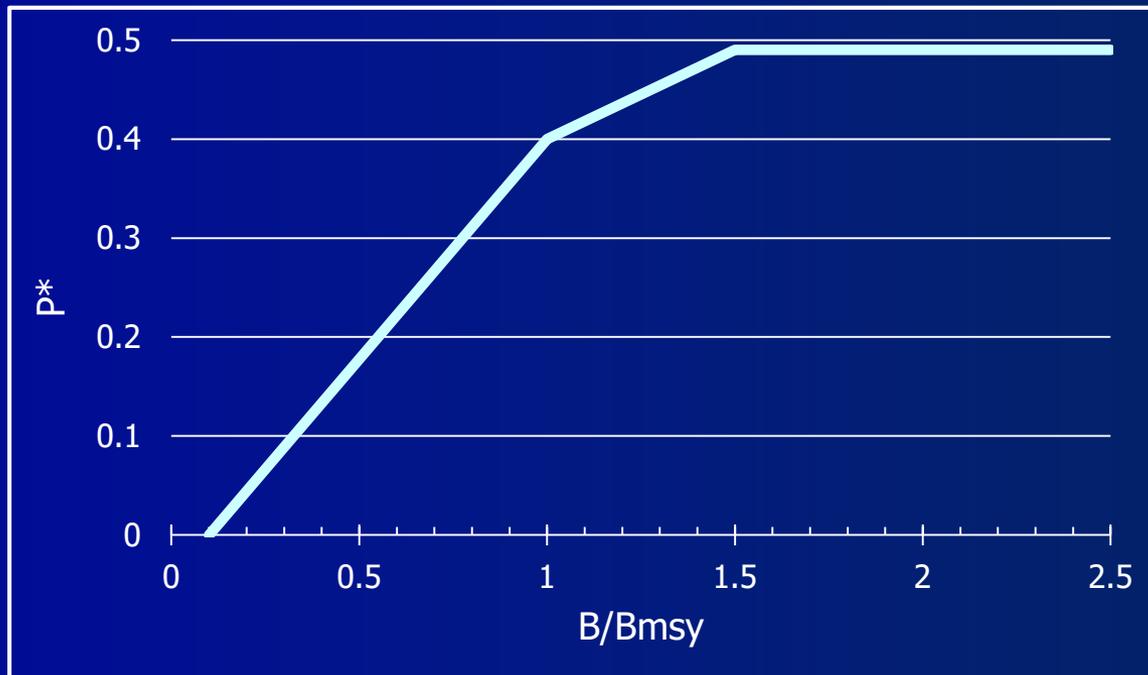
- Constant $P^* = 0.35$ when $B/B_{MSY} < 0.75$; constant $P^* = 0.40$ when $B/B_{MSY} > 0.75$ and < 1.0 ; constant $P^* = 0.45$ when $B/B_{MSY} \geq 1.0$
- Additional consideration of stock biomass but application of a constant P^*



Alternative 6

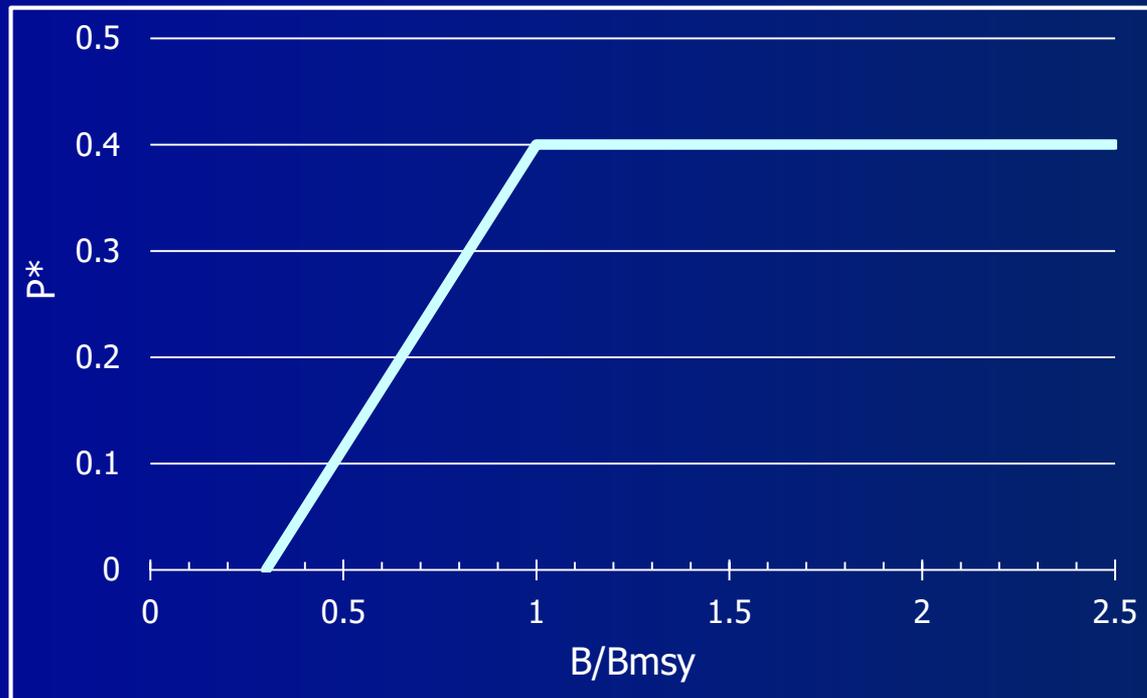
■ Modified linear ramping

- Linear increases in P^* to a max of 0.40 when $B/B_{MSY} \leq 1.0$; linear increases in P^* to max of 0.49 when $B/B_{MSY} \geq 1.5$
- $P^* = 0$ when B/B_{MSY} ratio = 0.1 (stock replenishment threshold)



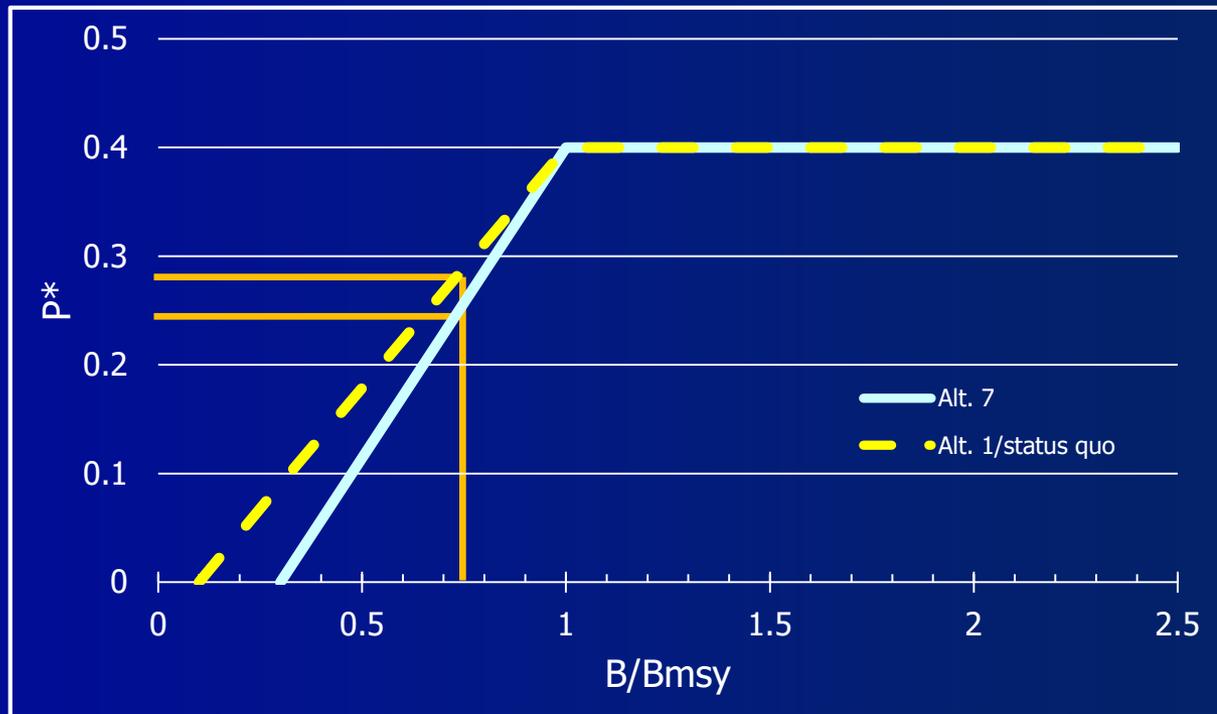
Alternative 7

- Current policy with linear increases in P^* to a maximum P^* of 0.4 when $B/B_{MSY} \geq 1.0$
- Modified stock replenishment threshold with a $P^* = 0$ when B/B_{MSY} ratio = 0.3



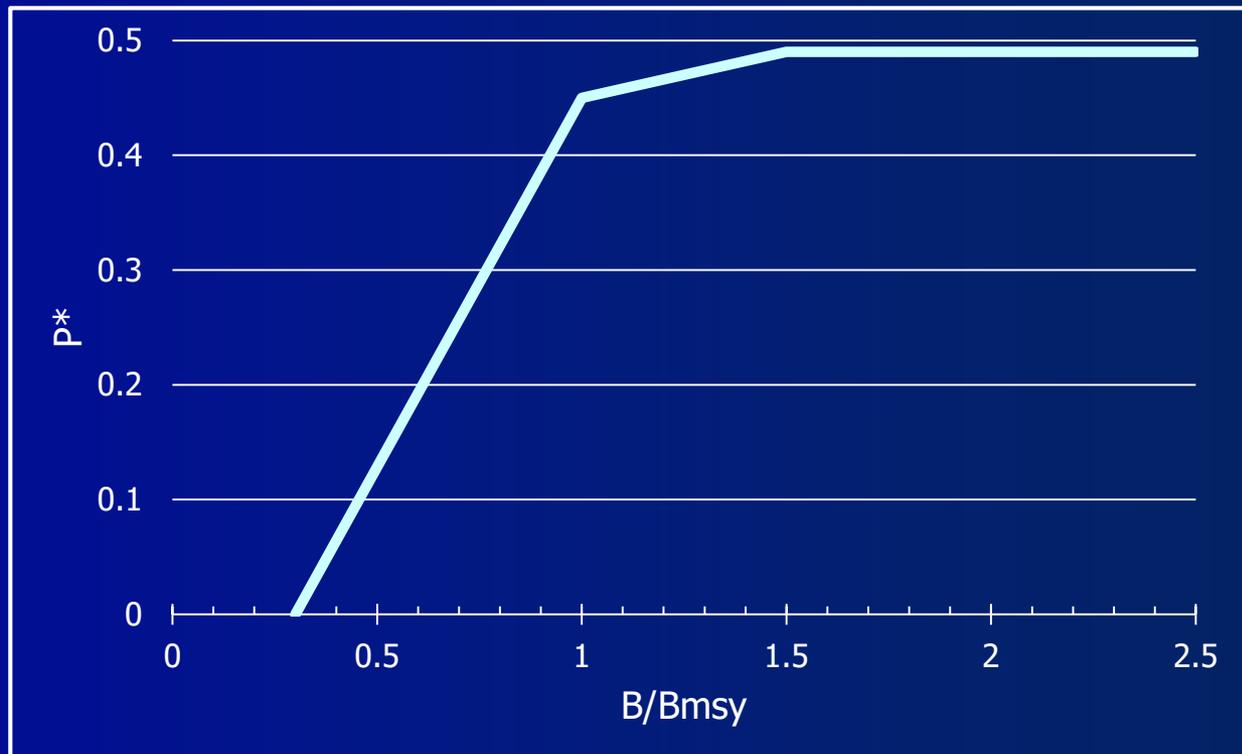
Comparison between Alt's 1 and 7

- Overall assumed lower level of risk
 - Lower P^* , under same stock biomass, when less than B_{MSY} and no fishing once biomass at 30% of B_{MSY}



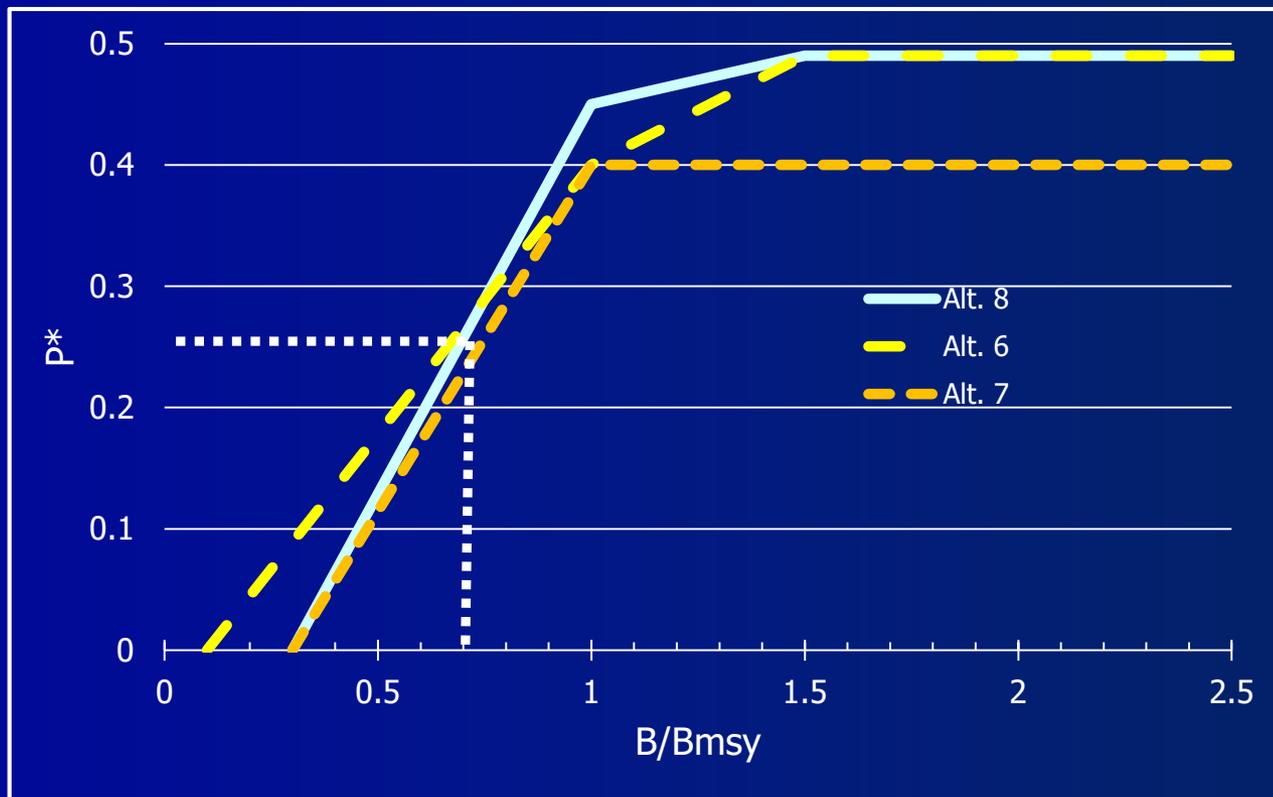
Alternative 8

- Linear increases in P^* to a maximum P^* of 0.45 when $B/B_{MSY} \leq 1.0$; linear increases in P^* to max of 0.49 when $B/B_{MSY} \leq 1.5$
- Stock replenishment threshold with a $P^* = 0$ when B/B_{MSY} ratio = 0.3



Comparison between Alt's 6, 7, and 8

- Overall, Alt 8 provides less risk at lower biomass levels compared to Alt 6 and higher risk at biomass levels around B_{MSY} than Alt's 6 and 7



Alternative 9

- Eliminate the typical/atypical distinction
 - Apply same policy regardless of life history
 - Species vulnerability to over-exploitation addressed in stock assessment and reference points
 - Only application of atypical designation – ocean quahog
- Does not specify a risk policy
 - Can't be selected as only option
 - Could be applied to any of the other alternatives (removal or retaining)

Note: alternative not explicitly evaluated in different MSE analyses

Move to other presentations

Quick & general summary of MSE results

- All alternatives generally limit risk of overfishing under average and good conditions
- Linear ramping alt's were better at preventing overfishing and reduced risk of becoming overfished, particularly under poor conditions
- Constant and/or stepped alternatives generally resulted in higher catch, economic welfare, and lower catch variability – particularly in short-term
- Results – risk and catch – highly dependent on current/starting stock biomass
- Importance and potential biological and management implications of assessment bias

Metric Description	Productivity or Assessment Error	Alternative							
		<i>Status Quo</i>	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7	Alt. 8
Prob. of Overfishing	Average	0.13	0.23	0.13	0.19	0.19	0.19	0.1	0.26
	Good	0.0	0.0	0.0	0.0	0.0	0.03	0.0	0.06
	Poor	0.32	0.39	0.58	0.58	0.48	0.32	0.32	0.39
	Underestimate Biomass	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.06
	Overestimate Biomass	0.32	0.47	0.39	0.52	0.48	0.45	0.32	0.48
Prob. of Becoming Overfished	Average	0.14	0.23	0.15	0.24	0.23	0.24	0.14	0.27
	Good	0.03	0.05	0.03	0.05	0.05	0.06	0.02	0.06
	Poor	0.72	0.8	0.87	0.87	0.84	0.75	0.71	0.78
	Underestimate Biomass	0.0	0.01	0.0	0.02	0.01	0.02	0.0	0.04
	Overestimate Biomass	0.29	0.5	0.32	0.5	0.48	0.5	0.3	0.57
Cumulative Short-Term (5-Year) Economic Welfare (in millions USD)	Average	0	36	72	82	67	7	-20	16
	Good	0	45	74	91	76	16	-20	30
	Poor	0	27	68	73	58	3	-19	6
Cumulative Long-Term (20-Year) Economic Welfare (in millions USD)	Average	0	7	6	11	9	0	-1	9
	Good	0	50	0	49	50	43	1	59
	Poor	0	3	14	13	12	-2	-4	-3
Avg. Change in Catch	Average	0.14	0.15	0.12	0.13	0.14	0.16	0.15	0.17
	Good	0.09	0.09	0.08	0.09	0.09	0.11	0.09	0.11
	Poor	0.18	0.2	0.14	0.15	0.16	0.19	0.2	0.23
Max Change in Catch	Average	0.36	0.42	0.26	0.31	0.34	0.45	0.4	0.51
	Good	0.31	0.34	0.27	0.3	0.31	0.4	0.32	0.4
	Poor	0.47	0.52	0.3	0.33	0.35	0.51	0.56	0.64

Staff Recommendation(s)

- Based on MSE results, evaluating trade-offs, and considering Council goals and objectives
- Recommend continuing with the linear ramping approach
- **Alternative 2** – linear ramping with a maximum P^* of 0.45 when B/B_{MSY} ratio is ≥ 1.0
 - Performed well across all three species and all scenarios considered
 - Best balanced biological and fishery trade-offs – minimized risk while allowing for increases in yield
 - No scenario in which prob. of overfishing exceeded 50%

Staff Recommendation(s)

- **Alternative 9** – support eliminating the typical/atypical designation
 - Significant improvements and advancements in assessments and modeling approaches
 - Better quantitatively derived biological reference points capturing a species life history characteristics
 - NRCC assessment process will allow for continued research and assessment advancements
 - These improvements better account for a species vulnerability to over-exploitation
 - Limited use of designation to date

Staff Recommendation(s)

- Retain single risk policy applied to all Council-managed fisheries
- If new risk policy is selected, retain for several years in order to evaluate performance in future review
 - Similar to current risk policy which has generally performed well since implementation
 - NRCC process allows for increased opportunities for Council and SSC to receive update stock information and respond in a timely manner
- Future review(s) could consider more fully implement economic goals/objectives and/or other EAFM considerations

Meeting Outcomes

- Council selects preferred alternative(s)
 - Select among alternatives 1 – 8 to specify risk policy
 - Alternative 9 – retain or removal of the typical/atypical designation