DRAFT Penaeid Shrimp MSY and ABC Control Rule Workshop Summary
Hilton New Orleans Airport Hotel
New Orleans, LA
October 7, 2014

Discussion of MSY and ABC Control Rule Based Benchmarks for Penaeid Shrimp Workshop

Rick Hart presented MSY estimates from the models for all penaeid shrimp stocks. The reduction in effort in the shrimp fishery has contributed to all penaeid shrimp stock landings being well below the estimated MSY. The results of the model outputs are provided in Table 1.

Table 1. Model outputs of MSY for penaeid shrimp. For pink and white shrimp, both MSY and F_{msy} were multiplied by 12 (shown) because the stock synthesis model for those two species treats each month as a year. Thus, the MSY and F_{msy} produced are for a month not a full year.

	Annual MSY (lbs of tails)	**Annual F_{msy}**
Pink Shrimp	17,345,130	1.35
White Shrimp	89,436,907	3.48
Brown Shrimp	146,923,100	9.12

There was a question about exceeding MSY if the entire fleet fished or was allowed to increase. It was determined that it would be possible. The model incorporates periods of both high and low effort, and the current effort is low. The CPUE currently is at an all-time high- the number of pounds per day fished has doubled in federal waters. The fleet in federal waters is currently under effort restrictions, but there was concern that effort could increase and that this would affect CPUE, bycatch, and MSY. The group was reminded that the purpose of the workshop is to evaluate MSY and that the permit moratorium issue will be addressed by the council in a different document.

The group discussed that the Council is currently defining the overfished definition for penaeid shrimp in terms of a spawning biomass index calculated using the stock synthesis model, and the overfishing definition is based on the fishing mortality rate. Both of these thresholds are addressed in Shrimp Amendment 15.

The spawning stock biomass is the biomass of adults and MSY is dependent on the selectivity of the fishery. The F_{msy} is calculated as an annual F_{msy}. There was some concern about the high value of F_{msy} produced by the model and the different F_{msy} profiles for three species with similar life histories. It was clarified that the apical F is what is moving forward for Amendment 15 and is different from the F_{msy} produced. These analyses are MSY based and are different values. It outputs MSY and an F_{msy}, but because they are based on the monthly time steps for white and pink shrimp, the F_{msy} is multiplied by twelve. Brown shrimp is treated differently because the model is an annual model with seasons; this is because of how recruitment occurs for brown shrimp. To compare to current overfishing thresholds for penaeid shrimp, it would be appropriate to use the sum of the

monthly F estimates in a given year not the apical F (which is what is currently used in Shrimp Amendment 15). **The group's recommendation is to accept the SS methodology and the values of MSY and F_{msy} presented in Table 1.**

It was clarified that all of the MSY outputs were in metric tons of tails which have been converted to pounds of tails. There was discussion that the landings per year presented in the NMFS database are whole weights, and the pounds provided in this document are in tail weight. There was discussion about the numbers produced in the reports not matching the numbers that are available on the NMFS website and that addressing this conversion in future documents.

The group then evaluated the ABC control rule. The group set about filling out the tier 1 ABC control rule spreadsheet for evaluating ABC for penaeid shrimp (Appendix 1). After completing the exercise and fully evaluating each choice in the Tier 1 spreadsheet for the ABC control rule, the group felt that it was more appropriate to set the ABC equal to the MSY. The rationale for this was because shrimp are an annual stock and overharvesting in one year is unlikely to affect the following year's stock. The group also discussed that the socio-economic consequences of fishing below MSY based upon a 'buffer' is greater than the biological impact (to shrimp) for exceeding MSY over a short time period. **The group's recommendation is that the ABC control rule for penaeid shrimp is MSY=ABC.**

Workshop Participants

Harry Blanchet
Rick Burris
Gary Graham
Rick Hart
Leslie Hartman
Walter Keithly
James Nance

Council Member and Council Staff

Harlon Pearce
John Froeschke
Morgan Kilgour
Karen Hoak

Other Participants

Clint Guidry
Christopher Liese

Appendix 1

$$P^* = \exp\left[-a - b \sum_{i\ \mathrm{dimension}} Dimension\ score_i\right]$$

P* = 0.410

Maximum Risk	**0.50**	S_{hi}=	3.998
Minimum Risk	**0.30**	a=	0.693
		b=	0.1277703

$a = -\ln(0.50)$ $\quad b = -\dfrac{a + \ln(0.30)}{S_{hi}}$ $\quad S_{hi} = highest\ possible\ score$

Element scores are scaled from zero to a maximum.
In this example the maximum is 2.00, but this can be changed

Dimension	Dimension Wt	Tier No.	Tier Wt	Element Score	Element	Score it	Element Result	Tier Result	Dimension Result
Assessment Information	**1**	1	1	0.00	Quantitative, age-structured assessment that provides estimates of exploitation and biomass; includes MSY-derived benchmarks.	x	0	0	0.00
				0.67	Quantitative, age-structured assessment provides estimates of either exploitation or biomass, but requires proxy reference points.				
				1.33	Quantitative, non-age-structured assessment. Reference points may be based on proxy.				
				2.00	Quantitative assessment that provides relative reference points (absolute measures of status are unavailable) and require proxies.				
Characterization of Uncertainty	**1**	1	.333	0.0	The OFL pdf provided by the assessment model includes an appropriate characterization of "within model" and "between model/model structure" error. The uncertainty in important inputs (such as natural mortality, discard rates, discard mortality, age and growth parameters, landings before consistent reporting) has been described with using Bayesian priors and/or bootstrapping and/or Monte Carlo simulation and the full uncertainty has been carried forward into the projections.		0.67	0.2231	1.56
				0.67	The OFL pdf provided by the assessment model includes an approximation of observation and process error. The uncertainty in important inputs (such as natural mortality, discard rates, discard mortality, age and growth parameters, landings before consistent reporting) has been described with ***SENSITIVITY RUNS*** and the full uncertainty has been carried forward into the projections.	x			
				1.33	The OFL pdf provided by the assessment model includes an incomplete approximation of observation and process error. The uncertainty in important inputs (such as natural mortality, discard rates, discard mortality, age and growth parameters, landings before consistent reporting) has been described with ***SENSITIVITY RUNS*** but the full uncertainty ***HAS NOT*** been carried forward into the projections.				
				2.0	The OFL provided by the assessment ***DOES NOT*** include uncertainty in important inputs and parameters.				
		2	.333	0.0	Retrospective patterns have been described, and are not significant.		2.0	0.666	
				1.0	Retrospective patterns have been described and are moderately significant.				
				2.0	Retrospective patterns ***have not*** been described ***or*** are large.	X			
		3	0				999	0	
					NOT USED				
		4	.333	0.0	Known environmental covariates are accounted for in the assessment.		2.0	0.666	
				1.0	Known environmental covariates are **partially** accounted for in the assessment.				
				2.0	Known environmental covariates ***are not*** accounted for in the assessment.	x			