Atlantic States Marine Fisheries Commission
Delaware Bay Ecosystem Technical Committee Report

January 10, 2012

Participants

Delaware Bay Ecosystem Technical Committee Members
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Dr. Sarah Karpanty (Virginia Tech), Shorebird Advisory Panel Chair
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The Delaware Bay Ecosystem Technical Committee (TC) met via conference call on January 10, 2012, to review the Draft Addendum VII to the Horseshoe Crab Fishery Management Plan. The TC agreed that the best option for management of the horseshoe crab bait fishery was to move forward with implementing the Adaptive Resource Management (ARM) Framework, Option 3. The TC agreed that Option 1 (no action) was less risk averse than implementation of the ARM Framework, and thus should not be the recommended option. The TC noted that Option 2 (status quo) may be more or less risk averse than the ARM Framework but does not allow for adjustments to the management program based on the best available scientific information and increased understanding of population dynamics and its response to management gained from implementing the ARM Framework. The TC also emphasized that the ARM Framework is currently ready to implement, and delaying implementation would not likely bring any substantial changes without feedback from implementation. The TC also supported the idea of the ARM Framework, in contrast to continuing the status quo (Option 2) or previous management (Option 1), and implementing a scientific-based harvest level, rather than allowing a certain portion of the previous, unregulated harvest levels. In addition the TC expressed appreciation for the amount of time and effort that had been put into the building of the ARM Framework by the state and federal partners. For these reasons, the TC recommends implementing the ARM Framework, Option 3. The TC noted that, should the Board decide to continue the status quo (Option 2), that a sunset clause of one year be included, in order to provoke considering implementation of the ARM Framework as soon as possible under the proposed options. **Overall, the TC agrees the ARM Framework was the preferred option because it has the best scientific support, allows for harvest changes as populations change, and will result in better understanding by reducing uncertainty over time.**

Option 3a, Lambda
The TC could not reach consensus on the appropriate lambda value. The default values (1.0 for all states) are the most conservative option for the Delaware Bay stock, but this option is not based on scientific evidence and, if incorrect, could lead to increased exploitation of the southern region population. Lambda values based on genetic analysis are scientifically derived, but the data were not collected specifically to address the question at hand, and the accuracy of the results is therefore uncertain. **The majority of the committee recommends setting lambda values no lower than those values based on the genetics data for Maryland and Virginia. However, one member of the committee who could not participate on the conference call expressed concern than the true values could be lower than the genetics values. There was consensus among all TC members that a directed genetics and/or tagging study would be beneficial to directly estimate lambda values.**

Option 3b, Weighting allocation
In its previous report, the TC did not recommend any values for weighting but deferred, citing the policy basis of the question. In its discussion on the call, the TC suggested against using average landings, due to the lack of fairness and lack of representation of the fishery with this option. This option would allocate no quota to New Jersey and thus shift harvest to the other states since all of the harvest would still be allocated. The TC also recommended against basing the weighting on the abundance estimates from the Virginia Tech Trawl Survey, as the survey was not intended to divide its trawls among the states. The TC suggested that using current management measures reflects past policy and management decisions. The TC also emphasized that should a state decide to be more conservative than the ARM Framework or ASMFC plan specifies, the "extra" crabs should not be reallocated among the remaining states. If needed, Addendum II allows for transfer of quota after review by the TC, which would give states flexibility as long as it did not compromise the goals of the plan. **The TC recommends basing the weighting allocation on Addendum VI levels.**

Option 3c, Harvest cap
The TC again pointed out that the harvest cap has the greatest ability to impact how many crabs are harvested out of the mid-Atlantic and is only a consideration should the Board select lambda values for Maryland and Virginia that are less than 1.0. Selecting a cap based on Addendum VI quota levels best reflects past management decisions to be risk averse in allocating among the states. A cap based on Reference Period Landings or Addendum I would be ineffective at limiting harvest. Addendum III's levels would be more risk averse than RPL or Addendum I levels, but would not reflect more recent management decisions. The use of recent average landings would penalize states that had chosen to be more conservative than ASMFC requirements, which would be inconsistent with promoting state decision-making. **Thus, the TC continues to recommend the implementation of a harvest cap based on Addendum VI levels.**

Option 3d and 3e, Delaware Bay Stock Allowance, with or without 2:1 male:female offset
The TC noted that the ARM Framework last recommended Harvest Package #3, which is a 500,000 male-only harvest. In its last report, the TC did not recommend any option for the Delaware Bay Stock Allowance, deferring it to the Board as a policy decision. However, Draft Addendum VII includes an option that attempts to maintain the status quo level of harvest. TC

participants on the conference call felt that the ARM Framework should be implemented as intended and allow the adaptive aspects of the model to work as designed. Participants noted that to implement the ARM Framework, only to include deviations that allow the status quo harvest to continue, would undermine the purpose, intent, and work behind the ARM Framework. A Delaware Bay Stock Allowance would compromise the predictive ability of the framework, and allowing even a small level of bycatch would turn into a female quota. However, one TC member who could not be present for the conference call felt that implementation of the DBSA would not be excessively detrimental to implementation of the framework. **Thus, the majority of the TC recommends against implementation of the Delaware Bay Stock Allowance, but consensus was not achieved.**

The use of a 2:1 male:female offset, although it may lead to more perfect implementation of the ARM Framework under some circumstances, would further convolute the implementation of the framework and move away from the ARM structure. In addition these options potentially decrease the transparency of the model and its impacts to the public, due to their complexity. **Thus the TC recommends against implementation of the 2:1 male offset.**

Option 3f, Plan B for management

The TC agreed that there should be a mechanism for a contingency plan in management rather than leaving a potential management loophole that would need to be rectified with an emergency measure or a hastily-formulated addendum. However, the TC agreed that the Board should consult the TC and the Shorebird and Horseshoe Crab Advisory Panels prior to making any decision. The TC also believed that limiting the choices to previous management measures under Addendum VI or the past year's ARM-recommended measures would be a premature decision. The best option will likely depend upon many factors, including: how long the ARM Framework has been in effect, how much the ARM Framework recommendations have deviated from Add VI, how has the ARM Framework recommendation has changed over the years, and how likely it is the monitoring will be resumed in future years. **Thus, the TC suggests the following language for Option 3f, which would allow the TC and Advisory Panels to consider the most recent data available to make an informed recommendation to the Board for their consideration.**

Replace paragraph 3 under Option 3f with the following:

The absence of these annually-collected data sets would inhibit the use of the ARM Framework.

If these data were not available for the summer harvest decision, the Delaware Bay Ecosystem Technical Committee, or relevant technical committee, along with the Horseshoe Crab and Shorebird Advisory Panels would review the best available scientific information and provide recommendations to the Board. The Board would review the recommendations and, via Board action, set the next season's harvest.

Conclusion

In summary, the TC supported implementation of the ARM Framework (Option 3) but expressed concern about the impacts of deviating from the ARM Framework. The TC felt that selecting certain options would undermine the predictive ability of the models, thus decreasing the utility of the ARM Framework in management.

1) *Lambda, λ*
   The majority of the TC recommended lambda values between the genetics data and the default conservation values. The full committee agreed that directed genetics and/or tagging studies would be useful to directly estimate lambda values.

2) *Allocation weights, w_i*
   The TC recommended basing the allocation weights on the Addendum VI quota levels.

3) *Harvest cap for Maryland and Virginia*
   The TC recommended basing a harvest cap for Maryland and Virginia on Addendum VI quota levels, should the Board select lambda values for Maryland and Virginia that are less than 1.0.

4) *Delaware Bay Stock Allowance (DBSA)*
   The majority of the TC recommended implementing the ARM optimized harvest recommendation without deviations from the ARM Framework recommendation.

5) *Delaware Bay Stock Allowance with 2:1 male:female offset.*
   The TC recommended implementing the ARM optimized harvest recommendation with no 2:1 offset of male crabs.

6) *Plan B for management*
   The TC recommended that should the necessary annual data to run the ARM model not be available, the Board consult the Delaware Bay Ecosystem Technical Committee and/or appropriate technical committees, Shorebird Advisory Panel, and Horseshoe Crab Advisory Panel to review the available data and recommend a management approach.