

Joint Horseshoe Crab and Shorebird Technical Committees Report

April 5-6, 2010

The ASMFC Horseshoe Crab and USFWS Shorebird Technical Committees (TCs) met jointly on April 5th and 6th near Philadelphia. The meeting included an opportunity for interested stakeholders to learn more about and provide input to the Adaptive Resource Management (ARM) Framework. Members reviewed the Peer Review recommendations for moving forward with the ARM Framework. Also, the TCs were asked to provide suggestions for improving the ARM Option being composed for possible inclusion in Draft HSC Addendum VI. The following is a summary of the meeting.

Attendees

Technical Members and Invited Participants

Gregory Breese, Co-Chair (USFWS)

Dave Smith (USGS)

John Sweka (USFWS)

Jim Lyons (USFWS)

Conor McGowan (USGS)

Kevin Kalasz (DE)

Karen Bennet (DE)

Stew Michels (DE)

Steve Doctor (MD)

Alicia Nelson (VA)

Amanda Dey (NJ)

Larry Niles (CWF – NJ)

David Mizrahi (NJAS)

Jeff Brust (NJ)

Allen Burgenson (HSC AP)

Rick Robins (HSC AP)

Nellie Tsipoura (NJAS)

Tiffany Black (FL)

Larry DeLancey, Co-Chair (SC)

Jim Nichols (USGS)

Linda Stehlik (NMFS)

Annette Scherer (USFWS)

Penny Howell (CT)

Brad Spear, Staff (ASMFC)

Others

Kristoffer Whitney (UPenn)

Faith Zerbe (DRN)

Maya Von Rossom (DRN)

Emile Devito (NJ CF)

Tim Dillingham (ALS)

Jonathon Cohen (VT)

Dave Hata (VT)

ARM Framework & Stakeholders

Lead ARM modeler Conor McGowan presented an overview of the Framework and preliminary results. The meeting was open for stakeholders to ask questions and engage with committee members in discussions about the Framework and models. Some stakeholders strongly criticized the lack of clear guidelines and process for getting their ideas and comments to the ARM Work Group (AWG) and Joint TCs. The value-based components of the ARM Framework (e.g., objectives, population thresholds) benefit from broad stakeholder input.

Several stakeholders felt that they should be involved in the discussion with the AWG and/or the Joint TCs as they deliberate. One NGO plans to write a letter to offer suggestions for how stakeholders can effectively provide their input. The Joint TCs recommend that the Board and ASMFC staff clearly define who a stakeholder is and determine when and how stakeholders can effectively participate and provide input beyond the normal public-hearing format.

External Peer Review of ARM Framework

Many Shorebird TC members felt that the process leading up to the Board Meeting in February 2010 did not meet their expectations. They expected to have a chance to comment on and recommend changes to the ARM Framework prior to the Board seeing the final ARM Report and Peer Review Report. At this meeting, the joint TCs were given the opportunity to review products of the ARM Workgroup and Peer Review Report before they are used by the Board to set harvest quotas.

Each management alternative within the ARM Framework is a harvest level of Delaware Bay region crabs, as a whole. At this time, the Framework does not address state by state quotas. Once an optimal harvest package is produced by the models, the Board would have to allocate the overall quota among the Delaware Bay region states. With further model development, an allocation scheme could be incorporated.

The group agreed it would be good to use past year's data to see if the ARM Models accurately predict state variables under the management actions that were taken. The Joint TCs recommended to the AWG as a near term high priority to conduct these retrospective analyses.

The Peer Reviewers recommended revisiting the choice to use "knife edge" objective functions, and the Joint TCs agreed. The group had a discussion of estimating carrying capacity for HSCs. Concern was raised that the estimation had significant uncertainty associated with it, and members recommended that it be reconsidered. Also, there was a proposal to set a "sloped" objective function for female HSC abundance to start valuing harvest at 65% of carrying capacity (9.1 million) with full value at 80% carrying capacity (11.2 million). There was question as to why the current Framework uses 80% carrying capacity and why it is not higher.

The TCs debated the issue of the current Framework structure allowing full value for female harvest of HSCs when female red knots reach 45,000. They also discussed whether 45,000 red knots was an appropriate number. Suggestions were made to move to a "sloped" objective function. One proposal made started valuing female HSC harvest at 45,000 knots and another at 30,000. Both proposals gave full value to female HSC harvest at 65,000 knots. It was pointed out that with current levels of birds it would take several years before 45,000 was reached; so adopting a higher threshold now would not change model outputs in the near future. Regardless of which thresholds are chosen, the ARM Framework must clearly specify which survey modelers will use to monitor numbers against the threshold.

It was also discussed that there may be issues with the sensitivity of the knife-edge and slope functions, i.e., they both act like knife-edge and impart full value to harvest as soon as the lowest threshold is reached. Dr. McGowan suggested this may be caused by the difference in the numeric scales of abundance data (e.g., millions of crabs) relative to harvest options (thousands of crabs) and would require exploration.

The Peer Review was supportive of moving forward with the ARM Framework as presented. The Joint TCs agreed, given that improvements will continue to be made and that a stakeholder process will be developed and implemented within the next year.

Several errors (typos and one table intended to be a place holder but never was replaced) were in the report that went to Peer Review. The Committees agreed that it was appropriate to correct these things before the Framework is used.

Review of Draft Addendum VI ARM Option

ASMFC staff was tasked with composing a management option for Draft Addendum VI to implement the ARM Framework. Staff asked the TCs to consider how to integrate this ARM process with the ASMFC process. The August Board meeting was identified as the best time for annual review and revisiting of harvest alternatives under the ARM.

Currently, management decision making occurs using the most recent data, which are often from different years. Implementing the ARM Framework would be no different. If August (in year t) is chosen as the time for the Board to revisit management decisions using the ARM Framework, it would set harvest requirements for the following year ($t + 1$). The ARM models would be populated with HSC data from the previous year ($t - 1$) and shorebird data from the current year (t).

The TCs recommended implementing the ARM Framework using two cycles (i.e., double loop learning; Figure 1): 1) *Annual Cycle* (i.e., the ‘iterative phase’ in Figure 1); and 2) *Longer Term Cycle* (i.e., revisiting the ‘set-up phase’ in Figure 1) every 3 or 4 years.

Annual Cycle

- August (year t) – Board decides harvest
- June (year $t + 1$) – TCs compile monitoring data
- July (year $t + 1$) – AWG run models/optimization
- August (year $t + 1$) – Board revisits harvest decision

Longer Term Cycle (every 3-4 years)

- Solicit formal stakeholder input on ARM Framework to be provided to TCs
- TCs review stakeholder input and technical components of ARM models; make recommendations to the Board
- At the May meeting, Board selects final components of the ARM Framework, and tasks TCs to work with AWG to conduct models runs/optimization
- Pick up Annual Cycle
 - In July, AWG runs models/optimization
 - In August, Board revisits harvest decision

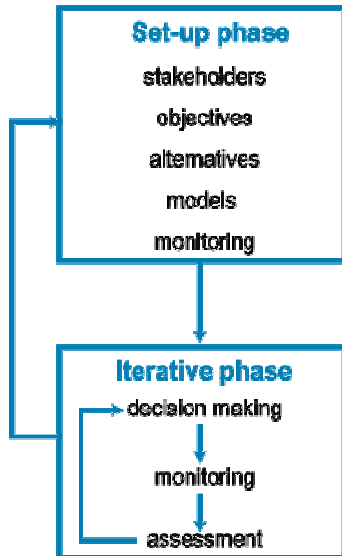


Figure 1: Double loop learning process of adaptive management (Williams et. al 2007)

In order to run the models and present useful results to the Board in August, the AWG needs data from two key indices: 1) the VT benthic trawl survey; and 2) marked/unmarked ratio red knot data. The trawl survey data are currently available. The red knot data will come from a new survey being implemented this year and should be available by late June. In addition, the lead modelers will need to complete the computer programming to incorporate catch data, simulate the marked/unmarked survey data, and conduct the final optimization runs. The AWG and TCs believe it is reasonable to expect these tasks will be completed in time for the August Board meeting.

Recommendations to the Board Regarding the ARM Framework

Below is a consensus list of recommendations from the Joint TCs to the Board. The list is recommendations extracted from text in the sections above.

- 1) Recommend Board move forward with ARM Framework (as peer reviewed with minor corrections) in August 2010.
- 2) Complete Annual Cycle as proposed in Draft Addendum VI.
- 3) After the August Board meeting, complete one iteration of the Long Term Cycle as proposed in Draft Addendum VI, consistent with double-loop learning.
 - a. Allow formal stakeholder input to be provided through stakeholder workshops and technical committee meetings.
 - b. AWG conduct retrospective/sensitivity analyses and address improvements recommended in Peer Review Report.
 - c. Allow TCs opportunity to change value-based components (e.g., utility function, objective function, thresholds) and technical aspects of framework/models.
- 4) On a continuing basis complete the Long Term Cycle on a 3-4 year cycle.
- 5) Board must define stakeholders and ‘formal stakeholder input’ process.

Virginia Tech Benthic Trawl Survey

The 2009 survey was conducted Sep 20-Nov 21. A large spike in juveniles was seen for the Delaware Bay region. However, decreases in catches of mature and newly mature crabs were seen

from the previous year. Over the time series, a general increasing trend in HSC catch (male and female across all life stages combined) is apparent in the Delaware Bay region. Water temperatures were cooler than in previous years, and the survey was later in its timing. This survey seems to adequately sample the population of interest for Delaware Bay, except for the bay itself. For 2010, a survey within Delaware Bay is planned.

Funding is adequate through 2010. Beyond that, there is no funding and the survey is in danger of ending. The annual cost of the survey is around \$250K (including salary and overhead). Several potential sources of funding were identified, but nothing is likely at this time.