



Atlantic States Marine Fisheries Commission

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ASMFC Horseshoe Crab Advisory Panel Call Summary

April 5, 2016

Advisory Panel Members: Dr. Jim Cooper, Benji Swann, Rick Robins, Allen Burgenson, Brett Hoffmeister, John Turner, Jay Harrington

ASMFC Staff: Kirby Rootes-Murdy and Amy Hirrlinger

Public: Peter Himchak

The Horseshoe Crab Advisory Panel (AP) met via conference call to discuss the following items: 1) Alternative Horseshoe Crab Bait Trials 2) Biomedical data and the next Horseshoe Stock Assessment 3) Review and updating of the ARM Framework in 2016 4) Review of Biomedical BMPs for handling horseshoe crabs. Below is a summary of their discussion.

1) **Alternative Horseshoe Crab Bait Trials** (*K. Rootes-Murdy*)

a) Overview of Alternative Bait Trial Results

Kirby Rootes-Murdy provided an overview of the alternative bait trials that were conducted by Connecticut and Rhode Island fishermen in conjunction with state agencies in 2014. Alternative bait supplied by LaMonica Fine Foods of New Jersey were used in the trials. The alternative bait contained between 1/10 to ¼ horseshoe crab. The main finding of the bait trials was that the alternative bait did not differ in resulted catch of conch than traditional horseshoe crab bait. Based on these findings, the Management Board requested that a cost comparison be conducted to evaluate whether the alternative bait was cost competitive relative to traditional horseshoe crab bait. In undertaking the cost comparison, ASMFC staff met via conference call with the Alternative Bait Working Group, (a subcommittee of the Horseshoe Crab Technical Committee) to consider elements and possible questions for the Advisory Panel to provide comment on regarding the costs associated with horseshoe crab bait. Based on discussion with the Alternative Bait Working Group, three distinct situations would be need to be evaluated 1) Traditional bait costs 2) alternative bait from La Monica Foods 3) alternative bait made by fisherman.

b) Questions for the Advisory Panel on Cost/Time & Discussion

Regarding questions of cost and considerations of alternative bait, the AP members provided the following comments:

- Conch legal size varies from state to state, so a comparison of legal size in CT and RI should be also compared against trial studies in other states along the coast with different legal sizes.
- The alternative bait trials indicate some promise, but the sample size of the study is limited and additional trials should be undertaken throughout the range of the fishery.
- Conch fishermen have already taken measures to preserve horseshoe crabs, as indicated by the maximum amount of horseshoe crab that can be used in bait bags and cups in many states. Any further restrictions or requirements of an alternative bait should take these current conservation measures into account.
- Many Conch fishermen look to the processor or dealer to supply horseshoe bait, so a move to alternative bait provided by LaMonica Fine Foods would need to be sent to dealers/processors- otherwise, this would be a new step and potential challenge in securing bait.
- While the LaMonica Fine Foods bait product has been interchangeably labelled 'alternative' or 'artificial' relative to traditional horseshoe crab bait, this is misleading. The bait product produced by LaMonica Fine Foods contains horseshoe crab, and as many bait fishermen use a combination of horseshoe crab and other ingredients already, a more appropriate term should be 'composite bait' rather than 'alternative' or 'artificial'.
- Conservation efforts in Massachusetts include a dual use of horseshoe crabs where a portion of crabs intended for bait will first be bled for biomedical use. This makes the best use of a precious resource and reduces the overall demand on the horseshoe crab fishery.
- La Monica Fine Foods makes their bait product on an order-by-order basis. For this 'composite' bait to be utilized across the coast, they would have to scale up production significantly.
- Lastly, members of the AP encourage the Commission to pursue a research/education/outreach strategy regarding conservation of Horseshoe Crabs through current regulatory measures.

Public Comment

- Peter Himchak pointed out that the bait product produced by LaMonica Fine Foods is not a money maker for the company, and there isn't a lot of interest by fishermen in making their own, as a bait slab costs only \$40 (between \$.8- \$1.60 per piece/puck of bait).

The AP members did not offer specifics on the cost of refrigeration, current cost of bait gotten from dealers/processors, or estimated cost of time spent harvesting horseshoe crab.

2) Biomedical data and the next Horseshoe Stock Assessment (K. Rootes-Murdy)

Kirby Rootes-Murdy provided an overview of the issues confidential biomedical data pose in conducting a stock assessment. Members of the AP took part in a call with ASMFC staff and Horseshoe Crab TC members in 2013, at which point a few options for conducting the next Horseshoe Crab stock assessment were discussed. There was not agreement on how the next stock assessment should be conducted as Biomedical Representatives were not in favor of an assessment that disclosed biomedical catch data publicly and TC members were not in favor of conducting an assessment where biomedical catch data would be reviewed, but not be made available publicly. Since this call, there has not been

developments on different or new stock assessment approaches for horseshoe crab. The one change was the number of biomedical bleeding facilities in the Delaware Bay Region (currently at 4) which would now be considered non-confidential when the data is pooled as an aggregate number on the regional level. Questions to the AP were how receptive would they be in a stock assessment using biomedical data moving forward and thoughts on the Delaware Bay Region biomedical data becoming non-confidential (as an aggregate number on a regional level) and possibly used in future stock assessments.

a) Questions and comments from the Advisory Panel

The AP had an extensive discussion on trying to find a solution to allow for a stock assessment to proceed without jeopardizing current confidentiality. Regarding considerations on biomedical data being used in stock assessment, the AP members provided the following comments:

- The number of horseshoe crabs caught and utilized by the biomedical industry are almost negligible when compared to commercial bait harvest landings. Additionally the loss or mortality from the biomedical industry are estimated to be 15%, but that 15% estimate comes from a study did not match conditions in the biomedical facilities. Many AP members contend that mortality is less than 15%, likely closer to 3%.
- Benji Swan suggested combining all the biomedical data and applying it proportionally to the regions, such as to the Delaware Bay region, that it would be close enough without jeopardizing confidentiality.
 - Kirby provided the following response on the call and in greater detail in an email to the AP on April 20:
 - 1) From what the Technical Committee and Stock Assessment Subcommittee (TC/SAS) can infer from available fishery independent and dependent data, there are regional populations of horseshoe crab (roughly broken down as New England, New York/Long Island Sound, Delaware Bay, and Southeast) along the Atlantic coast of the US. And these regional populations likely vary in size and abundance, with the Delaware Bay region likely having the largest population. This was determined in the previous two assessments (2009 assessment and 2013 assessment update)
 - 2) What we know from annual compliance reports is the amount of horseshoe crabs utilized by the biomedical industry varies by facility and regionally along the coast- there are more facilities in the Delaware Bay region than there are in New England and the Southeast. Additionally, not every facility utilizes the same number of horseshoe crabs- Associates of Cape Cod do not use the same number of crabs as

Limuli, nor does Heptest labs (VA) use the same amount of crabs as either Associates of Cape Cod, Limuli, or Charles River Endosafe. Similarly, we know that the biomedical mortality varies by region- the coastwide biomedical mortality of an example number of horseshoe crabs (78,000) does not breakdown to 1/3s (approximately 26,000) across the New England, Delaware Bay, and Southeast regions equally. So if we know that the breakdown is not correct, and we have the data to support that conclusion, we cannot present to a peer review panel that that regional biomedical mortality estimate is a representation of the reality, or our best guess at reality, when we know it is not.

- 3) Returning to the regional populations idea established from the previous assessments, even if we went with a 1/3s regional breakdown of the 78K horseshoe crabs biomedical mortality estimate, we also know that a 26K horseshoe crab mortality in the Delaware Bay region (largest population) attributed to biomedical catch and use is different than 26K mortality in New England (different population size). When you take into account commercial bait harvest differs along the coast and by region too, the 26K mortality estimate is different in the DE Bay than New England, and is different in the Southeast than both of them. And if we know that 26K isn't correct, then we also would know that our estimated impact of that combined mortality (bait and biomedical) on each of the regional populations would also be wrong. If we want to have a stock assessment pass peer reviewed, we cannot present information that we know is wrong.
- 4) Lastly and again, data for the horseshoe crab assessment needs to be examined on a regional level, not a coastwide level- this was the recommendation of the previous stock assessment. So for example, to understand abundance and mortality in New England we need to look at commercial data, biomedical data, and fishery independent data at the regional level. As there is only 1 biomedical facility in the New England region, the biomedical company's horseshoe mortality estimate is considered confidential. If there were 3 biomedical facilities in New England (for example companies A, B, and C) we could disclose what that biomedical mortality estimate is for the region as an aggregate number (A+B+C= biomedical mortality). When presented as an aggregate number, each individual companies' horseshoe crab mortality estimate remains confidential (as does the number of crabs caught and brought to a facility) and unable to be linked back to the others (so even if you know company A's mortality, you don't know what B or C's is, nor how many crabs companies B or C utilized). So for the Delaware Bay region, the aggregate mortality estimate from the 4 companies could be reported out as one number, without disclosing each company's mortality estimate. This is why data confidentiality for the Delaware Bay region facilities can be preserved while also putting forth a more correct mortality estimate.

- AP members took issue with the idea of biomedical data in the Delaware Bay Region becoming non-confidential.
- Concern remains among the AP that if biomedical data were disclosed to the public, it would be detrimental to their businesses- both because if this information were disclosed to their

competitors, it would be hurt their business (in knowing how many crabs were used) and environmental groups would try to use the information against them.

- The AP members indicated that there are additional sources of mortality that are more significant than biomedical use- strandings, disease, predation by other species, and altered beaches.
 - Kirby noted to the group that this is accounted for in a natural mortality estimate that is fixed across the coast. The issue remains that with biomedical caught and bled is a variable mortality estimate, one that is estimated at varying degrees along the coast, but cannot be used because of confidentiality.
- *****Overall the AP members were in strong opposition to the use of biomedical data in the next stock assessment if that information were to be disclosed publicly*****

3) Review and updating of the ARM Framework in 2016 (*K. Rootes-Murdy*)

Kirby Rootes-Murdy provided the AP an overview of the current ARM Framework review. At the 2016 Winter Meeting, the Board supported moving forward with a short-term, partial review of the ARM Framework to be conducted by the ARM Subcommittee in consultation with the Horseshoe Crab TC.

The ARM Subcommittee met twice a month from February through April 2016 to consider components of the ARM Framework to be updated. Areas of possible change in the ARM Framework include valuation of female horseshoe crabs, alternative harvest packages, abundance thresholds for allowing female horseshoe crab harvest, and the possibility of including biomedical data in the ARM Framework moving forward.

*****The AP again raised concerns over confidentiality and indicated their preference that biomedical data not be used in the ARM Framework.*****

4) Review Biomedical BMPs for handling horseshoe crabs (*J. Cooper*)

Dr. Jim Cooper provided the group with an overview of Ad-Hoc Working Group Report from 2011 on biomedical best management practices. The AP members indicated that nearly all of the practices outlined in the document are currently being utilized by biomedical facilities. Moving forward AP members indicated that adherence to these BMPs should be publicized more.

5) Other Business/Adjourn

- Benjie Swann requested that the graph on the ASMFC website indicating biomedical catch and bait harvest be adjusted, as it could be perceived to indicate removals from both sectors are comparable.
 - Kirby indicated that an alternative graph will be sent to her soon
- Other AP members indicated that the biomedical industry- specifically those involved in the catch and bleeding of crabs for developing Limulus Amoebocyte Lysate and other biomedical products- need to be given more credit for their role in the providing a vital resource to the biomedical field.

TO: Horseshoe Crab Management Board
FROM: James Cooper, Chair, HSC Advisory Panel
RE: Position Paper of biomedical group on Stock Assessment

April 26, 2016

The HSC board received a summary of an April 2016 meeting of the HSC Advisory Panel. In the opinion of the biomedical group, the summary does not reflect the extensive dialogue by the AP members to try and find a solution that would allow the Stock Assessment to proceed without jeopardizing confidential data. As suggested, dividing the biomedical mortality number (78,000) proportionally among the impacted regions would be a viable alternative and produce a reasonable estimate. The biomedical mortality numbers are a small fraction of the bait harvest and a minuscule fraction of the total population (20 million in Delaware Bay alone, according to work of Dr. Carl Schuster and Dr. David Smith); therefore, the relevance of the number being exact does not seem justified.

What does the mortality number actually mean? The FMP required biomedical firms to supply their State with collection and use data, but did not limit harvest. The FMP also specified a number, a so-called threshold level, at which the ASMFC would review biomedical practices if the estimated loss of HSC exceeded this number. The intent of the threshold was to evaluate the HSC biomedical catch and reporting should the estimated mortality exceed 57.5K specimen per year. **This number was selected arbitrarily** and was never envisioned as an unacceptable quantity or upper limit for biomedical collection. The threshold number is not the reported mortality, but is an estimated mortality based on 15% of the annual biomedical catch; it is not an exact number and is an over-estimate.

As this threshold was exceeded, the Board asked the biomedical group to evaluate its HSC handling practices and to incorporate them into a formal document. The ASMFC sponsored a Working Group of biomedical and State fisheries representatives that met in 2011 and created the Best Management Practices (BMP) document to detail their procedures that insure minimal stress and mortality during collection and handling of HSC. The group discussed and analyzed the 8 basic steps for handling HSC in the biomedical facility, from collection to bleeding to return-to-sea. The BMP specified behaviors such as timely transport to the LAL facility, protection from direct exposure to the sun, training of LAL personnel in handling and bleeding practices, prompt return to sea, and training of watermen in best handling techniques. The BMP is necessarily flexible to accommodate differences in climate, habitat and size of HSC with respect to a LAL firm's geographical location in the US. No further action was taken by the HSC Board which indicated their satisfaction with the response of the biomedical industry.

The LAL reagent business is small and stable. The firms that entered this business years ago are still involved today, although their company names may have changed. Their commitment to the quality of their product and to the horseshoe crab population is evidenced by their continued presence in the industry. The reagent is comprehensively regulated by the FDA. The extensive requirements that must be met to gain approval for LAL production is an enormous barrier to market entry. The likelihood of a new startup LAL firm in the next 10 years is highly unlikely. Three firms produce greater than 95% of the LAL reagent used worldwide; they are approximately equal in market share. The companies firmly believe that the numbers remaining confidential are crucial to their continued business success. HSC collection by these three firms constitutes the impact of HSC collection on stock assessment.

In summary, the Biomedical LAL industry requests that the Board reject the proposal by the SAC and ASMFC staff to illegally take confidential information from biomedical firms. Alternatively, we propose that representatives of the LAL industry advise the SAC of a meaningful way to use relevant HSC mortality data to arrive at a realistic stock assessment.



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ASMFC Horseshoe Crab Adaptive Resource Management Framework Review Update

April 2016

Horseshoe Crab Adaptive Resource Management Subcommittee members: John Sweka (USFWS), Steve Doctor (MD DNR), Jeff Brust (NJ DFW), Ed Hale (DE DFW), Jim Lyons (USGS), Larry Niles (American Littoral Society), Conor McGowan (Auburn University/ USGS), Wendy Walsh (USFWS), and Dave Smith (USGS)

ASMFC Staff: Kirby Rootes-Murdy and Kristen Anstead

In February 2016, the Horseshoe Crab Board tasked the Adaptive Resource Management (ARM) Subcommittee with revising three components in the ARM model as part of a short-term review process. Since then, the ARM Subcommittee has met twice a month by conference call to develop objectives, assign tasks, and make progress to complete an ARM review by fall 2016. Below are the three components of the short-term ARM model review, along with a summary of the discussions and progress that has been made. The ARM Subcommittee plans to complete the short-term review by the ASMFC Annual Meeting in October 2016.

1. Evaluate the Monitoring Program

- The ARM Subcommittee discussed the necessary continuation of the Virginia Tech (VT) trawl survey and the possible development of more advanced modeling in that region based on that data, such as a catch-survey model.
 - The group received confirmation that the VT trawl survey will resume in fall 2016.
 - After discussions on available data, it was determined that a catch survey model could not be developed at this time as the VT trawl survey is one of the only surveys that categorizes pre & repeat spawning females.
- The ARM Subcommittee considered a horseshoe crab tagging study done in the region to further determine regional abundance, but ultimately didn't feel it was ready for use in the model.
- Jim Lyons and shorebird biologists from Delaware and New Jersey are working on the annual red knot population estimate and are reevaluating the structure of their mark-resight data collection program and the assumptions in the model; a new sampling protocol was developed and drafted.
 - Will have preliminary analysis results by July regarding the model assumptions
 - The shorebird group is currently reviewing the new sampling protocol.

- The possibility of including data from biomedical catch and mortality estimates in the model for more accurate survival rates has been discussed because there are 3 or more facilities in the Delaware Bay region and therefore the data is no longer confidential (if combined as an aggregate number at the regional level), but the group is concerned this level of work is beyond the scope of a short-term review and would extend the timeline of completing the ARM review. The ARM Subcommittee views this as possible revision of the model inputs and will discuss it in more detail over the next few months in developing recommendations for the Board's consideration in August 2016.

2. Harvest Rates and Specifications

- Alternative harvest packages have been developed and discussed for incorporation into the revised ARM model, including the potential for more female harvest and the discrepancies between state quotas and recent harvest levels.
 - Current constraints in utilizing these additional harvest packages is the knife edge slope in the reward function of the abundance thresholds for the 1) female horseshoe crab abundance estimate and 2) red knot abundance estimate. If the abundance estimates are below the thresholds, no female horseshoe crab harvest is allowed.

3. Revisit the Objective Function

- Alternative formulations, including a change in the knife-edge slope, reward, and sex ratio utility functions, are currently being developed and considered.
- Consideration was given to changing the order of red knot and horseshoe crabs in the objective function to focus on red knots conservation more given the 2013 Endangered Species Act listing, but the group believes this wouldn't result in substantially different conservation measures outside of what the Commission has already considered through the decision-making framework process. In the future, there may be additional information provided by the US Fish and Wildlife Service on recovery considerations for red knots as the formal recovery plan is developed.