

# Atlantic States Marine Fisheries Commission

## Horseshoe Crab Management Board

*February 9, 2012  
8:30 a.m. – 10:00 a.m.  
Alexandria, Virginia*

### **DRAFT Agenda**

The times listed are approximate; the order in which these items will be taken is subject to change; other items may be added as necessary.

1. Welcome/Call to Order (*T. O'Connell*) 8:30 a.m.
2. Board Consent 8:30 a.m.
  - Approval of Agenda
  - Approval of Proceedings from November 9, 2011
3. Public Comment 8:35 a.m.
4. Draft Addendum VII for Final Approval **Final Action** 8:45 a.m.
  - Review options (*D. Chesky*)
  - Public comment summary (*D. Chesky*)
  - Delaware Bay Ecosystem Technical Committee Report (*J. Brust*)
  - Horseshoe Crab Advisory Panel Report (*J. Cooper*)
  - Shorebird Advisory Panel Report (*S. Karpanty*)
  - Law Enforcement Committee Report (*M. Robson*)
  - Consider Final Approval of Addendum VII
5. Other Business/Adjourn 9:55 a.m.

The meeting will be held at the Crowne Plaza, 901 N. Fairfax Street, Alexandria, VA 22314; 703-683-6000

*Healthy, self-sustaining populations for all Atlantic coast fish species or successful restoration well in progress by the year 2015*

# MEETING OVERVIEW

## Horseshoe Crab Management Board Meeting

Thursday, February 9, 2012

8:30 a.m. – 10:00 a.m.

Alexandria, VA

|   |   |  |
|---|---|--|
| Chair: Tom O'Connell (MD)<br>Assumed Chairmanship: 2/10   | Horseshoe Crab Technical<br>Committee Chair:<br>Larry DeLancey (SC)     | Law Enforcement Committee<br>Representative: |
| Vice Chair:<br>Dave Simpson (CT)  | Horseshoe Crab Advisory<br>Panel Chair:<br>Dr. Jim Cooper (SC)          | Previous Board Meeting:<br>November 9, 2011  |
| Shorebird Advisory Panel<br>Chair: Sarah Karpanty (VA)  | Delaware Bay Ecosystem<br>Technical Committee Chair:<br>Jeff Brust (NJ) |  |
| Voting Members: NH, MA, RI, CT, NY, NJ, DE, MD, DC, PRFC, VA, NC, SC, GA, FL, NMFS,<br>USFWS (17 votes) |   |  |

### 2. Board Consent

- Approval of Agenda
- Approval of Proceedings from November 9, 2011

**3. Public Comment** – At the beginning of the meeting public comment will be taken on items not on the agenda. Individuals that wish to speak at this time must sign-in at the beginning of the meeting. For agenda items that have already gone out for public hearing and/or have had a public comment period that has closed, the Board Chair may determine that additional public comment will not provide additional information. In this circumstance the Chair will not allow additional public comment on an issue. For agenda items that the public has not had a chance to provide input, the Board Chair may allow limited opportunity for comment. The Board Chair has the discretion to limit the number of speakers and/or the length of each comment.

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| <p><b>4. Draft Addendum VII (8:45-9:55 a.m.) Final Action</b></p> <p><b>Background</b></p> <ul style="list-style-type: none"> <li>• The Board initiated development of Draft Addendum VII for future horseshoe crab management at its August 4, 2011 meeting.</li> <li>• Draft Addendum VII includes options to replace Addendum VI, which is set to expire April 30, 2013. These options include the current management scheme and options to implement the Adaptive Resource Management (ARM) Framework (<b>Briefing CD</b>).</li> <li>• Public comment was gathered in December 2011 and January 2012 (<b>Supplemental</b>).</li> <li>• The Horseshoe Crab and Shorebird Advisory Panels reviewed the draft addendum in November (<b>Supplemental materials and Briefing CD</b>). The Law Enforcement Committee reviewed the draft addendum in December (<b>Briefing CD</b>). The Delaware Bay Ecosystem Technical Committee reviewed the draft addendum in January (<b>Supplemental materials</b>).</li> </ul> <p><b>Presentations</b></p> <ul style="list-style-type: none"> <li>• Overview of options and public comment summary by D. Chesky.</li> <li>• Delaware Bay Ecosystem Technical Committee Report by J. Brust, Horseshoe Crab Advisory Panel Report by J. Cooper, Shorebird Advisory Panel Report by S. Karpanty, Law Enforcement Committee Report by M. Robson.</li> </ul> <p><b>Board actions for consideration at this meeting</b></p> <ul style="list-style-type: none"> <li>• Select management options and implementation dates.</li> <li>• Approve final document.</li> </ul> |
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### 5. Other Business/Adjourn

**DRAFT**

**DRAFT**

**DRAFT**

**PROCEEDINGS OF THE**

**ATLANTIC STATES MARINE FISHERIES COMMISSION**

**HORSESHOE CRAB MANAGEMENT BOARD**

**The Langham Hotel**  
**Boston, Massachusetts**  
**November 9, 2011**

These minutes are draft and subject to approval by the Horseshoe Crab Management Board.  
The Board will review the minutes during its next meeting

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## INDEX OF MOTIONS

1. **Approval of Agenda** by Consent (Page 1).
2. **Approval of Proceedings of August 4, 2011** by Consent (Page 1).
3. **Move to approve Draft Addendum VII to the Horseshoe Crab FMP for public comment with the board's suggestions** (Page 8). Motion by Peter Himchak; second by Pat Augustine. Motion carried (Page 9).
4. **Move that the Horseshoe Crab Board recommend to the ISFMP Policy Board that Maine be removed from the management unit per Maine's request** (Page 10). Motion by Terry Stockwell; second by Ritchie White. Motion carried (Page 12).
5. **Motion to postpone until such time that the Maine Legislature has take action to prohibit the landings of horseshoe crabs.** Motion by Pat Augustine; second by Robert Ballou. Motion defeated (Page 12).
6. **Motion to adjourn, by consent.** (Page 12).

## ATTENDANCE

### Board Members

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|--|--|
| Terry Stockwell, ME, proxy for P. Keliher (AA) | David Saveikis, DE (AA)                        |
| Douglas Grout, NH (AA)                         | Stewart Michels, DE, Administrative Proxy (AA) |
| G. Ritchie White, NH (GA)                      | Roy Miller, DE (GA)                            |
| Rep. David Watters, NH (LA)                    | Tom O'Connell, MD (AA)                         |
| Dan McKiernan, MA, proxy for P. Diodati (AA)   | Bill Goldsborough, MD (GA)                     |
| Bill Adler, MA (GA)                            | Russell Dize, MD, proxy for Sen. Colburn (LA)  |
| Jocelyn Cary, MA, proxy for Rep. Peake (LA)    | Jack Travelstead, VA, proxy for S. Bowman (AA) |
| Robert Ballou, RI (AA)                         | Catherine Davenport, VA (GA)                   |
| William McElroy, RI (GA)                       | Bill Cole, NC (GA)                             |
| Rep. Peter Martin, RI (LA)                     | Robert Boyles, SC (LA)                         |
| Rep. Craig Miner, CT (LA)                      | John Frampton, SC (AA)                         |
| Lance Stewart, CT (GA)                         | Malcolm Rhodes, SC (GA)                        |
| James Gilmore, NY (AA)                         | Spud Woodward, GA (AA)                         |
| Pat Augustine, NY (GA)                         | John Duren, GA (GA)                            |
| Byron Young, NY, proxy for Sen. Johnson (LA)   | Aaron Podey, FL, proxy for J. McCawley (AA)    |
| Peter Himchak, NJ, proxy for D. Chanda (AA)    | Steve Meyers, NOAA                             |
| Adam Nowalsky, NJ, proxy for Asm. Albano (LA)  | Jaime Geiger, USFWS                            |
| Tom Fote, NJ (GA)                              |  |

(AA = Administrative Appointee; GA = Governor Appointee; LA = Legislative Appointee)

### Ex-Officio Members

Rick Robins, Advisory Panel Chair

Greg Breese, Shorebird Technical Committee

### ASMFC Staff

Vince O'Shea

Danielle Brzezinski

### Guests

Joe Grist, VMRC  
May Griffin, MA DFW  
Chris Moore, CBP  
Ross Self, SC DNR  
Michelle Duval, NC DMF  
Wesley Patrick, NMFS  
Marie Alexander, CE DEEP  
Jeff Brust, NJ DEP

Ken Hastings, Mason Springs Conservancy  
Capt. Lloyd Ingerson, MD DNR Police  
Jack McGovern, NOAA  
Nichola Meserve, MA DMF  
Allen Burgenson, Lonza Walkersville, Inc.  
Joseph Smith NMFS  
Dick Brame, CCA

These minutes are draft and subject to approval by the Horseshoe Crab Management Board.  
The Board will review the minutes during its next meeting

The Horseshoe Crab Management Board of the Atlantic States Marine Fisheries Commission convened in the Wilson Ballroom of the Langham Hotel, Boston, Massachusetts, November 9, 2011, and was called to order at 8:00 o'clock a.m. by Chairman Thomas O'Connell.

### **CALL TO ORDER**

CHAIRMAN THOMAS O'CONNELL: Good morning, everybody. My name is Tom O'Connell, Chair for the Horseshoe Crab Management Board.

### **APPROVAL OF AGENDA**

The first order of business is to approve the agenda. I know we have one addition under other business. The Fish and Wildlife Service would like to obtain some comments on the Horseshoe Crab Tagging Program. I think there may be one other item that Maine wants to bring up, Mr. Stockwell?

MR. TERRY STOCKWELL: That's correct, Mr. Chairman.

CHAIRMAN O'CONNELL: So we've got two other business items. Are there any other additions to today's agenda? Seeing none, the agenda stands approved.

### **APPROVAL OF PROCEEDINGS**

The next order of business is approval of our August 2011 board proceedings. Are there any objections with approving those proceedings? Seeing none, our August 2011 proceedings are approved.

### **PUBLIC COMMENT**

Now we're at the public comment period. This is an opportunity for the public to comment on items not on the agenda. We typically, if time allows, provide the public an opportunity to comment on actions to be taken by the board. Is there anybody from the public that would want to provide comment at this point? Seeing none, moving on, the item on the agenda is an update on funding the benthic trawl survey, and Danielle is going to provide the board an update on that.

### **UPDATE ON FUNDING THE BENTHIC TRAWL SURVEY**

MS. DANIELLE CHESKY: This will serve as a dual purpose. In terms of funding, I talked with Dr. Eric Holloman and Dr. David Hata who run the trawl survey. They are finishing up on the work. They've

gone through the Delaware Bay Area, both inside the Delaware Bay and outside the Delaware Bay, which was a recommendation from the technical committee starting in 2010. That has been going well.

In addition they are going to be doing some gear efficiency work to get a better estimate of what that swept area collects, which was another issue that was identified by the technical committee. On the funding part, I've been working with Dr. Eric Holloman in terms of identifying additional sources to apply for funding, including both private and government sources. We have been working that.

In addition they just received a donation from some of the pledge money that came from the industry a couple of weeks ago. So far 2011 is going very well and we're working on 2012 as we go, so hopefully we'll have a more positive update in addition to that in February. Thank you, Mr. Chairman.

CHAIRMAN O'CONNELL: Thank you, Danielle. Does the board have any questions? Mr. Adler.

MR. WILLIAM A. ADLER: Danielle, I asked this the last time; did any of the environmental groups contribute to that funding? I knew that the industry did on the surveys, and I think I remember Fish and Wildlife, the government did. Did any of the other groups that are so adamant at having this tagging study done; did any of them contribute? I know we sent letter asking.

MS. CHESKY: Just to clarify, we received funding the biomedical industry, which was matched by the National Fish and Wildlife Foundation. We received some pledges from the horseshoe crab bait industry, and that's what we have received so far for 2011 and 2012.

MR. ADLER: Yes, if I may, that's the industry and the government, and the other groups did not contribute anything, right?

MS. CHESKY: That's correct, sir.

### **BIOMEDICAL AD HOC WORKING GROUP REPORT**

CHAIRMAN O'CONNELL: I know there have been several letters sent over time requesting some financial assistance. Any other questions on this agenda item? The next item on the agenda is the Biomedical Ad Hoc Working Group. You may recall that at the last meeting we had kind of an update on

what the estimated mortality associated with biomedical practices is.

The plan does have a threshold level, and the board recommended that an ad hoc group be formed to begin discussing best management practices to reduce the mortality associated with biomedical. Danielle is going to provide an update on that group that met earlier in October.

MS. CHESKY: Mr. Chairman, as you said, the board initiated the Biomedical Ad Hoc Working Group at the August 2011 meeting. That group met on October 3, 2011, and it was comprised of technical committee representatives from Massachusetts, New Jersey, Maryland, South Carolina, Virginia and the National Marine Fisheries Service, as well as our Advisory Panel Biomedical representatives from the four companies that are represented there.

This was held as a closed door meeting as we had some concerns regarding some confidential information. In terms of the report just a couple of things to highlight; it is going to focus only on the harvest of biomedical crabs. We do have some dual-use crabs that are done mostly in Massachusetts.

The group recognized the potential value of this program, but the focus of this meeting was solely on the harvest of biomedical crabs. We used a particular chart to structure the discussion in terms of the process of the collection, and so the output of the report is recommendations. I think it was really positive that many of these recommendations really are already in use by the companies. What you'll see there is really a lot of the practices already happening.

In terms of the chart that we used, we identified it sort as these are the areas of opportunity on tracking how the harvest occurs, all ways to transport, holding, bleeding and then final transport and return to sea. This is how the report is structured, and this was the basis of our discussion. In terms of the area of collection, there are a couple of things that were highlighted.

One of things was reasonable tow times; 20 to 30 minutes was sufficient to get a sufficient number of crabs without having additional injury and whatnot. The group highlighted proper care and handling on the boat and when sorting was appropriate. They also highlighted the fact that night harvesting helps in terms of the crab survivability and the stress, especially during the excessive heat that we have during the summer.

They also highlighted that really sorting on the boat can help in terms of the health of the crabs throughout the process. One thing that tends to resonate throughout the process was that there should be written specifications in terms of expectations by all those who are involved in interacting with the crabs and that correspond with periodic audits of those processes.

Moving on to transport, you'll see a lot of the same things in terms of temperature. Avoiding extreme temperatures was a big thing as well as large and quick changes; limiting the stacking and making sure that the crabs aren't overstacked; minimize that transport time in between facilities. Direct sunlight was identified as a major issue throughout the entire process, so avoiding that; and then also securing the containers in the vehicle so they don't go rumbling around

Further, at the bleeding facility, the group highlighted this was a very controlled area. There are written procedures already for handling, sorting and the process that it goes through. There was a large emphasis in trying to avoid rebleeding crabs because it is recognized that it does stress the crabs a little bit.

There was also a lot of stress from all the groups there that the same care is maintained for the crabs whether they're selected for bleeding and not selected for bleeding and then after the bleeding process; and again internal audits to maintain that quality. Finally, post bleeding and holding; again, maintaining the same level of care was an aspect that all the groups emphasized; again, minimizing holding time, temperature, cool, dark, moist.

It was agreed by everyone that they would not keep the crabs out of the water for more than 36 hours, so it's a fairly quick turnaround time from harvest to this facility and back. Finally, in terms of the return to sea; again, maintaining that same level of care afterwards. It is not just before the actual bleeding occurs – and then written contracts and again periodic audits.

There were some overall themes to all of the recommendations and the best management practices; again, written contracts, periodic audits. Temperature and moisture were a big emphasis in terms of keeping those crabs calm and less stressed. And then the results of a lot of discussion about establishing a greater dialogue among the companies and the collectors and the state-regulating agencies to identify issues ahead of time and work through them

in more of a cooperative process, and then as required by our FMP to ensure that there is proper monitoring of the mortality along the way.

In summary the group felt that the initial document and the discussion was a very good start to understanding what would be necessary for a best management practices document. There was great interest in producing a more complete document for use in the future. The group noticed that there has been a lot of potential ebb and flow in terms of institutional knowledge, and so producing a more complete document would be very helpful in establishing and putting down that knowledge in one place.

In addition, the group expressed interest in encouraging a peer review of all the published biomedical mortality studies. One of the discussions was that there is lots of variance in terms of the conditions under which those studies were done, and so having a peer review to go through all those differences would be something that they suggested and potentially could be tasked to the technical committee. That's my report. Thank you, Mr. Chairman.

CHAIRMAN O'CONNELL: Thank you for the great report and the work of the ad hoc group. Any comments or questions by the board? We need to discuss what the steps of this are going to be. Dan.

MR. DAN McKIERNAN: A question to Danielle; who do you envision would conduct a peer review?

MS. CHESKY: The group was not certain where it could be. It could be internally within the technical committee. There could be some other options as well. I don't know if you had any thoughts, Jeff.

MR. JEFF BRUST: There was some talk about the technical committee doing it though the technical committee has done this already. There was some talk about possibly giving it to the AP because the AP are the folks who are actually in the field doing this kind of work, and they have not had the opportunity to provide to the board their thoughts on the published studies. Those are the two that I remember. I don't think we discussed it as an external peer review, but I'll have to go back to our notes.

MR. STEWART MICHELS: Danielle, did you guys discuss making these best management practices maybe a condition of the state permits or anything like that; was there any discussion regarding that?

MS. CHESKY: Not at this meeting. There potentially could be a future meetings, but was really very much of an information session to better understand what the process is and to identify best management practices, a lot of which were already in use.

MR. PATRICK AUGUSTINE: Just a question on the bleeding process; did the technical committee review the mechanisms that will allow the bleeders or the setup at the facility that clearly define what the protocol is? It says here when crabs are being bled that there is some way of when the rate slows down, that excessive bleeding is prevented.

I'm sorry to sound so ignorant on this, but we've never reviewed or even seen, unless we've been to a plant – and I haven't – a bleeding facility. What mechanisms do they use to determine when enough is enough? I was under the impression that typically the horseshoe crabs, when they do bleed to a point where their body won't allow anymore to go out, they automatically stop bleeding by themselves. Now that point was brought to us maybe two or three years ago when we had a discussion about it. There is a protocol but is there a device that will actually prevent that?

MS. CHESKY: We had a long discussion about this as well and what you're remembering is sort of accurate, and that's why this meeting was very important for our technical committee members to learn more about the process itself. The bleeding itself is monitored to watch that flow; and as soon as the flow slows down I guess naturally on its own, that's when the bleeding stops. The companies really emphasize that there are no efforts and they specifically prohibit the efforts to try to get more blood out of horseshoe crabs or whatever because that would be very detrimental to the crab itself.

MR. AUGUSTINE: Thank you for that clarification. The reason I even bring it up is it just seems that the mortality rate has not stabilized in terms of bled crabs if I look at the numbers unless the two trends continue up; more crabs that are bled, there is a percentage that continue to not make it; and a much greater picture, from what I understand, the need for this product worldwide has increased dramatically.

And so in the much bigger sense of all of that, are we managing the horseshoe crabs to protect and help and sustain the shorebird population or to support and expand a need for the product on an international basis, which now becomes an economic driver in a

different direction. That's not being philosophical; that's being real.

That applies to several other products or fish that we are managing where you have to wonder whether the end product is the profit being gained from international marketing at the detriment of the status of the stock. I won't mention any in particular, but I think you get the picture. I don't know if you can address that, Mr. Chairman, or if it's anything to talk about or we send it back to the – well, we at least keep the technical committee aware of it to see if we should not take a look at the relationship between need for shorebirds, rebuilding stocks, reducing harvest.

All of that is centered around the fact that New York's population continues to decline of horseshoe crabs because it's a great marketable product and other states have limited access to the product from a commercial basis. So to the detriment of the whole population, I think it's all linked together, and I'm not sure that anyone else would want to offer – I only offer it for consideration about which way are we going? Are we doing it from an economic driver point of view or are we doing it for a sustainable population? Thank you, Mr. Chairman.

MS. CHESKY: I can't address much of the second philosophical question, Pat, but in terms of the mortality that you see and how the mortality is calculated for the FMP reviews is there is a set amount of reported mortality, and then the board had decided to use a 15 percent estimated mortality from post bleeding, and that is really dependent upon the number of crabs that are collected for bleeding.

In terms of the goals, currently the goals and objectives of the Horseshoe Crab FMP do include both managing for the bait industry as well as biomedical and other dependent species like the shorebirds. I know as of right now all three of those are included under objectives for the FMP.

CHAIRMAN O'CONNELL: Just following up on that, obviously we're trying to manage this resource for multiple uses, and I think that's why we got to this point is we saw the estimated biomedical mortality increasing, exceeding the threshold. Recognizing the importance of that and the uses of this resource, we needed to look at ways to reduce that mortality, which led us to these best management practices.

Regarding next steps, in my review of the best management practices so far, I think it's a great start.

It identifies the pathways and the realities of what needs to be done, but I think there still needs to be additional work to add some specificity. For example, avoid excessive heat, proper care and handling, I think there is a lot of discretion that could be taken from those types of generalities.

I think we need to continue this effort to fine tune and add specificity to what those terms mean. I think Mr. Michels' idea of possibly making that a requirement as a permit may be something for the board to consider as well. Danielle, have you given any thought as to the next steps? Is this the right group to continue having this discussion and do we need to include others to try to provide some more specificity, if the board agrees with that?

MS. CHESKY: The discussion is centering around future aspects and where this report could potentially go. I think this group is very good group. It's the states that are involved and it's the companies that are involved. It is a very good group in terms of the resources and the knowledge that they bring in.

Certainly, moving forward and having more meetings was something that was of interest to the group as well as going through and not just expanding it but also revisiting this document in the future as technology changes and gets better.

CHAIRMAN O'CONNELL: Was there any objection of the board to have Danielle continue working with this group to try to fine tune this document and provide more specificity in bring it back to the board at a later date? Mr. Geiger.

DR. JAIME GEIGER: Mr. Chairman, I think that's a great idea, but one thing I would like is some due date certain when we can have it come back to the board for further discussion. Again, I think the more details and specificity we can put in best management practices the better all of us will be served, including the resource and the biomedical companies themselves.

CHAIRMAN O'CONNELL: I'll work with Danielle and the group and try to develop a timeline and bring that back to the board at the next meeting. Any other questions or comments on this agenda item? Mr. Ballou.

MR. ROBERT BALLOU: Actually most of my comments have already been echoed. I just wanted to emphasize that I think it's a very important initiative that I would hope would continue. I like the idea of a date certain. I was actually hoping that

maybe by the next board meeting there might be a revised document that might be at a point where we could start to look to incorporate that into a state-permitting process. I think it's a very important and excellent initiative, and I'd like to keep it on a fast track if at all possible. Thank you.

## DRAFT ADDENDUM VII

CHAIRMAN O'CONNELL: Thanks, Bob, I agree. All right the next agenda item is Draft Addendum VII. That has been drafted as potential action for the board to approve for public comment. Danielle is going to provide an overview of the draft addendum.

MS. CHESKY: At the August board meeting the board initiated development of Draft Addendum VII, and so we formed the PDT itself. This just gives you a timeline of kind of where we're at. November is where we're at right now, so board anticipated review and/or public comment in the winter and spring and review and final approval in the spring and summer of 2012.

In terms of the summary of the problem, what we're trying to address here is that horseshoe crabs do play such a distinct role. There are so many user groups; and as we've already discussed they support a bait industry, a biomedical industry and shorebird dependence on this as well.

It has been identified that although horseshoe crab landings have been reduced fourfold since 1998 when the first FMP went into place, red knots have continued to show no recovery, and so there have been concerns about what are the associations there. The other pressing issue is that the current Addendum VI included a sunset clause, and so as of April 30, 2013, that addendum and its requirements would expire and the regulations would revert back to Addendum III.

The graph here shows the bait fishery history and the red dashed line at the top shows where the landings were when the FMP was put into place, and so you can see the large difference that has occurred and just really emphasizing how much the bait landings have come down with the regulations that this board has put into place.

As mentioned, the Horseshoe Crab FMP was approved back in 1998; currently managing under Addendum VI which was approved last year in 2010. Really, it was just an extension of Addendum IV which was initially passed in 2006. Addendum VI did include an option for ARM implementation, but

there were concerns at the time about the stability of the trawl survey funding, and it did include a sunset clause itself.

In terms of the background on the ARM, the board has been exposed to the ARM and the development of it since April of 2006. Throughout that time, there has been quite a bit of development put into in terms of the framework, the modeling and whatnot, and the final version that is currently the basis for it was presented to the board back in February 2010.

The next issue that was identified was the allocation of the ARM harvest. The way the model works is it puts out a total harvest for the Delaware Bay Region which impact for states, New Jersey, Delaware, Maryland and Virginia. In August of 2010 the board was presented with a spreadsheet model by John Sweka.

That spreadsheet model for allocation was reviewed by the Delaware Bay Ecosystem Technical Committee in January of 2011, as well as both the Horseshoe Crab and Shorebird Advisory Panels in May. Those reports were presented to the board in August, right before the board initiated the development.

The ARM itself has two different phases. The setup phase itself is the very involved, going through the different models, running and finding out which sort of weighting is best, and then it goes into the iterative phase which is more of the yearly annual specification settings. The inputs for it are very important because it both considers the red knots, which are currently being reviewed by the Fish and Wildlife Service for listing under the Endangered Species Act, as well as the horseshoe crab abundance, which comes from the Virginia Tech Trawl Survey.

The models incorporate different models of dependence between the red knot survival and the horseshoe crab abundance. The current output is Harvest Package Number 3, which would 500,000 male-only harvest. As I said, there is no real allocation built into the ARM framework itself, and so that's where the allocation options come in.

The management options that are included in Draft Addendum VII are really three. Option 1 is no action, which would allow the current provisions to expire April 13, 2013, and we would revert back to Addendum III. Option 2 is to continue the status quo, which would continue the original Addendum IV provisions, and there would also be a couple of

suboptions for the board to consider to include or not include a sunset clause as has been included in the past.

Option 3 would be implantation of the ARM framework with quite a few of the allocation suboptions that the board has seen already. In terms of the suboptions for allocation, all of the suboptions that have been reviewed by the Delaware Bay Technical Committee and the APs have been included. It also includes, as requested, what we call Plan P.

So should those data inputs such as the Virginia Tech Trawl Survey not be able to be completed in the fall for input into next year's model, there would be some sort of management option that would allow the harvest and that would set up what would happen so we would not be left in limbo.

As a reminder, the management options in terms of the suboptions are four. The first one was the Lambda. There are three options that are included there; one of which bases the Lambda which estimates how much of a state's harvest comes from Delaware Bay. Those three options are based on the tagging data.

The default which is very conservative assumes that all Delaware Bay crabs harvested by the four states, New Jersey, Delaware, Maryland and Virginia, come from Delaware Bay, and then there are the values which are based on the genetics data, which sort of fall in between the two options there.

Suboption 3B is the weight allocation, so the options there are that allocation of harvest among the states can be based on historic harvest levels, current management, estimated abundance which would come from the Virginia Tech Trawl Survey, as well as recent average landings. The next set of management options, the suboptions we see is the discussion of a harvest cap, and this was meant to protect non-Delaware Bay crabs being harvested in Virginia and Maryland.

There are a few options there upon which to base that harvest cap level. And then finally Suboption 3D dealt with the Delaware Bay stock allowance. We have values there ranging from zero percent, which would be no allowance of harvest of female crabs to 10 percent, which is about currently the status quo, depending on some of the other options there.

The Delaware Bay stock allowance, just as a reminder to the board, comes into the discussion in

that the ARM is currently recommending a male-only harvest and something under this option would allow some female harvest of horseshoe crabs in Maryland and Virginia. In terms of possible next steps for the board, we see that there could be a few options there, and we've laid them out.

Option 1 would be to task APs and the Delaware Bay Technical Committee as well as possibly the Law Enforcement Committee with reviewing the current Draft Addendum VII. Those reviews and the prepared comments would be presented to the board at the next meeting in February, at which time the board could consider approving the document for public comment. Option 2 would be to approve the Draft Addendum VII currently for public comment as it stands, and then Option 3 would be to send the draft addendum back to the PDT with some direction on revising it. Thank you Mr. Chairman.

CHAIRMAN O'CONNELL: Thanks, Danielle; and just to kind of frame the issue, we have an addendum that will expire in April 2013. The different options that Danielle lays out, we're fortunate that we have adequate time to pursue either of these options.

One of the interests that I had heard in between the meetings was an opportunity for the advisory panels to review the document and provide some information for the public as to the socio-economic impacts of the different options; whether or not that is something the board thinks the public should be able to take into consideration as they review this document or not. With that, are there any questions on the addendum and then we'll open it up for next steps? Mr. Geiger.

DR. GEIGER: Mr. Chairman, I'm struck by is there a possibility that we can simultaneously do Option 1 and Option 2; in other words, get the comments from the ecosystem team chairs and the advisory committee but at the same time also go forward for public comment; to sort of expedite the process and then roll everything up together at the end. I was just throwing that option out as a possible option, and would that even be feasible given some of the timeframes.

CHAIRMAN O'CONNELL: Yes, that is definitely an option. I think one of the advantages of that is that you expedite the process, we are able to take action by the board in February versus the disadvantages that if the advisory panels and technical committees identify any major issues of concern, the public won't have an opportunity to consider that as part of the

addendum. Either option is available. Mr. Travelstead.

MR. JACK TRAVELSTEAD: Mr. Chairman, just a question about the addendum itself. I was looking back at the motion that the board passed at the last meeting to initiate development. It laid out a number of options and I just want to make sure all of the options are in there. The last option in the motion says an option that would increase the male crab quota in Maryland and Virginia to offset any reductions in the female crab quota due to the DBSA in those states. I can't find that option in the addendum. Maybe I missed it or maybe it's not clear, but can you help me with that?

CHAIRMAN O'CONNELL: Yes, I do recall that being part of the motion. Danielle, can you comment on that?

MS. CHESKY: Yes, Mr. Chairman, we worked with Alicia Nelson from Virginia; and as it's currently set up if there would be a decrease in the number of total crabs because of the limits on female crabs, those would be offset with male crabs, and so the total harvest would not change for Virginia depending upon potential harvest cap, Lambda. All the options interact but, yes, there is the offset depending upon which options are chosen.

MR. TRAVELSTEAD: Can you tell me where that is in the document, which option is that?

MS. CHESKY: It would depend upon the combination of options, depending upon which Lambda was selected. I think one of the major factors there would be the Lambda as well as the harvest cap; so whether that harvest cap was based upon the current Addendum VI, which would limit Virginia to 60,998 crabs – and remember we're just talking east of the COLREGS Line. We're not talking Virginia's total harvest. Potentially if that number was chosen as a harvest cap, 60,998 – and currently there is a two-to-one ratio of female-to-male crabs – if no female crabs were allowed, Virginia could still harvest 60,998 crabs. They would just have to be all male.

MR. TRAVELSTEAD: Thank you, that's helpful. I think maybe if we just added a sentence or two in the document that describes what is going on in the table so that the public will understand what that is about, that would be great.

CHAIRMAN O'CONNELL: Thanks for catching that. Mr. Himchak.

MR. PETER HIMCHAK: Mr. Chairman, I was under the impression that this draft addendum had undergone enough review by the advisory panel, ecosystem team, technical committee team, shorebird technical committee, and I was hoping that we would pass it out today with Jack's modification for public hearings and get on with the process and not to delay this any longer.

MR. MICHELS: I'm in agreement with Peter on the issue, but just a little point of clarification. I'd like to ask Danielle to kind of go over the Plan B, as you put it, for this addendum. Can you go into that a little bit?

MS. CHESKY: The current language we have in there addresses the fact that if those required inputs to set the specifications on the yearly basis are not available, and so that includes not only the Virginia Tech Trawl Survey but also the red knot abundances – we wanted to make it broad enough to include both of those – that the management measures would revert back to set management measures.

Currently within the draft addendum it's listed as Addendum IV, which is the current status quo, as one of those options. If the board wishes, they could also include other options there to which you revert back to, so it could be any multitude of things. It could be past management measures, it could be a set level of harvest split up among the four states one way or the other.

It's really just establishing aspects of that should there not be those inputs that are necessary to set the annual specifications there is some sort of a management measure and it's established on what it would be so that we're not trying to do something at the last minute, an addendum, emergency action or anything along those lines. Does that answer your question?

MR. MICHELS: Yes, it does. I'd be a little concerned that if we move forward for a period of time and management progresses and then for whatever reason we don't let's say get adequate funding for the trawl survey in a single year, that we would then revert all the way back to – you know, this may live for several years and we may revert all the way back to the Addendum VI level of harvest or all the way up to the Addendum VI harvest level, whatever the case may be. I was thinking that the board could consider maybe the option to hold the current status quo under the ARM Model for consideration. Thanks.

CHAIRMAN O'CONNELL: That could be something the board considers as they discuss the next steps on this addendum. Mr. Geiger, do you have a comment?

DR. GEIGER: Yes, I think that's an excellent suggestion by Stew. I certainly think that would be very valuable. Again, I think it makes more sense, as more reasonable, and again it gives us more scientific background and some more confidence should we not continue the funding for the Virginia Tech Survey, which hopefully we will have a longer-term funding stream for that.

CHAIRMAN O'CONNELL: Before we get into action on this draft addendum, are there any other questions on the addendum itself? Seeing none, then we need to take action on the draft addendum. Mr. Himchak.

MR. HIMCHAK: Well, let me attempt a motion here to move to proceed with Draft Addendum VII to the Horseshoe Crab Fishery Management Plan to public hearings with Stew's suggest of status quo under the ARM Model in case of – you know, I'm kind of like winging this, I'm sorry, but, yes, I like Stew's comment and Jack's comment; and if we incorporate that into motion, then we should be able to have public hearings as soon as possible.

So Stew wants the status quo option in the event that we lose the basis for funding the input parameters on the ARM Model, and Jack wanted some wording to ensure that he would get an increased male harvest in the event the ARM doesn't allow any female crabs out of the Delaware Bay population. I didn't obviously craft this ahead of time. Is that motion sufficient with those understandings that I just read into the transcript?

CHAIRMAN O'CONNELL: Danielle is suggesting perhaps a motion that would proceed with the draft addendum for public comment with the board's suggestions.

MR. HIMCHAK: Great; and then we don't have to go on –

CHAIRMAN O'CONNELL: Let's see if we can get that language up on the screen. All right, **we have a motion that reads move to approve Draft Addendum VII to the Horseshoe Crab FMP for public comment with the board's suggestions.** The motion was made by Mr. Himchak; second by Mr. Augustine. Do we have discussion on the motion? Mr. Travelstead.

MR. TRAVELSTEAD: I earlier thought I heard Jaime suggest we might send it back to the AP simultaneously with going out to public hearing, and I'm wondering if that would be a problem.

CHAIRMAN O'CONNELL: Does the board have any objection with doing that on a parallel track? Seeing none, Mr. Himchak.

MR. HIMCHAK: I think I see a problem with it if the AP report is given at the same time as the options in the addendum. It's kind of like they're leading you in a certain direction. I don't think it would be appropriate as a separate document at the public hearing on the addendum.

CHAIRMAN O'CONNELL; I think my understanding is that as the document goes out for public comment it would also be given to the advisory panel and technical committees for an opportunity to review; is that my understanding, Mr. Travelstead?

MR. TRAVELSTEAD: Isn't that normal procedures; don't we send addendums to our APs for comment before we adopt them? I mean we just did that with striped bass a couple of days ago.

CHAIRMAN O'CONNELL: My understanding is that the advisory panel and technical committees that would review would be reported back to the board in February and not a document that would be part of the public comment period. Does that clarify your concern, Pete? Okay, thanks. All right, do you guys need a 30-second caucus? Mr. Beal.

MR. ROBERT E. BEAL: Just a procedural question; the option that Stew Michels suggested; is that replacing the reversion back to Addendum VI or is that another option that's going to be included into the document?

CHAIRMAN O'CONNELL: My understanding is it's another option; does the board concur with that? Yes, another option.

MR. BEAL: Does the board envision that written as – you know, if we ever got to that position where the funding wasn't there for the Virginia Tech Survey or the ARM Model couldn't be updated, would there be board discretion at that time whether to go status quo or revert back to Addendum VI; or as this develops, is the board in the position just to select one of those and that's automatically the option that is implemented down the road?

MR. MICHELS: I guess I would prefer an “or” and leave it at the board’s option to either revert to Addendum VI levels or continue with the status quo under the last ARM Model recommendation. That would be optimal, I think.

MR. BEAL: I was just checking so when we draft this thing it’s consistent with what the board expects, so that’s great.

CHAIRMAN O’CONNELL: So the intent of this component of the plan is to have an “or” statement as to if funding for the benthic trawl survey is no longer available, that issue will come back to the board and the board will decided to revert back to the previous addendum or maintain status quo? Okay, thanks. Do we need a 30-second caucus on this?

(Whereupon, a caucus was held.)

CHAIRMAN O’CONNELL: All right, everybody ready. All those in favor of the motion please raise your right hand; all those opposed please raise your right hand; any abstentions, 1 abstention; any null votes. **The motion carries.** Mr. O’Shea.

EXECUTIVE DIRECTOR JOHN V. O’SHEA: Mr. Chairman, just a clarification. We need to tinker with what we presented to you this morning and include some other comments that we were made, so my question is do you want us to just simply do that, do you want us to have you approve what we do or do you want to send this back out to the board for a week and by correspondence have board members sign off on it?

CHAIRMAN O’CONNELL: I look to the board for guidance. It sounds like the changes are relatively minor and I’d be happy to take a look at it to make sure it’s consistent with the intent of today’s discussions if the board is okay with that. Otherwise, we can send it out to everybody. Anybody object if I take the lead in reviewing it? All right, I’ll do that. Danielle.

MS. CHESKY: Mr. Chairman, just to clarify in terms of the timeline, expectations for coming back to the board, February or the May meeting just so staff knows when to start working on the public hearings and to ask you all if you want them.

CHAIRMAN O’CONNELL: Based upon today’s discussion, I assume that the board would like to have this back in the February meeting, so we need to schedule the hearings accordingly. Those states who

would like a hearing, please notify Danielle. Mr. Miller.

MR. ROY MILLER: Mr. Chairman, it isn’t clear to me when those hearings would be held. Are we talking before or after the February meeting?

CHAIRMAN O’CONNELL: My understanding is it would be before the February meeting and then this addendum would come back for final action to the board in February. Mr. Himchak.

MR. HIMCHAK: I just wanted to mention that New Jersey would definitely request a public hearing. I think it would be a great introduction for Danielle to enter the New Jersey public hearing process; but as I assured Mike Waine when he came up for menhaden, she will be well protected by Marine Fisheries Administration staff.

MR. MICHELS: Danielle, we would like you to come to Delaware, too, but we don’t offer such protection.

## OTHER BUSINESS

CHAIRMAN O’CONNELL: All right, if anybody else would like a hearing, please follow up with Danielle as soon as you can; Maryland as well. All right, that leads us to other business. We have two items on the agenda. The first one is the Fish and Wildlife Service seeking comment on the Horseshoe Crab Tagging Program. Danielle.

MS. CHESKY: The Fish and Wildlife Service put out a notice in the Federal Register on September 26, 2011, requesting comments on the Horseshoe Crab Tagging Program and its utility and use by user groups as well as the requirements and collection burdens in terms of time and whatnot.

As soon as this came out, I e-mailed our technical committees and our APs to see what interest they had in potentially doing some sort of a response, and there was a strong recommendation from all the technical committee and AP members that I heard back from saying that, yes, they felt that this was a good opportunity for ASMFC to put out its support for the Horseshoe Crab Tagging Program.

As you saw in the presentation on the draft addendum, that tagging data has been used in developing some of the options that are within the draft addendum for management under the ARM. They are data that the technical committee does look at throughout the process. The question is now

before the board in terms whether or not the board would support and/or request having that letter sent by ASMFC submitting comments on the tagging program itself.

CHAIRMAN O'CONNELL: Any guidance from the board on this? Is there any objection for the commission to send a letter in support of the tagging program? All right, seeing none, I'll work with Danielle on that. The last item on the agenda is an issue that Maine wants to bring to the board's attention. Mr. Stockwell.

MR. STOCKWELL: Since 2003 Maine has had zero horseshoe crab landings, and in the last four years only issued two licenses; one in 2009 and one in 2010. As a result, our ongoing department reorganization is retasking our current biologist, and it's Maine's interest to be removed from the Horseshoe Crab Board. I have a motion if it's all right with you, Mr. Chair. **I would move that the Horseshoe Crab Board recommend to the ISFMP Policy Board that Maine be removed from the management unit.**

CHAIRMAN O'CONNELL: Thank you, Mr. Stockwell. Do we have a second to the motion? Seconded by Mr. White. Mr. Fote.

MR. THOMAS FOTE: Do we really need a motion since it is really up to Maine whether they have a declared interest; and if they no longer have a declared interest in horseshoe crabs, then they just remove themselves from the board.

MR. BEAL: Mr. Chairman, this is consistent with how the Horseshoe Crab Board excused Pennsylvania from participating in this management board. As everyone will recall, there was concern over potential horseshoe crab landings going into Philadelphia, so Pennsylvania was originally on this management board. They closed that potential loophole.

We just went through the process and had the record of the Horseshoe Crab Board recommending to the policy board and the policy board approving that just so there is clear record of why that state was on the board and now they're longer on the board. It creates a clear record of allowing one state to be removed from the board.

CHAIRMAN O'CONNELL: Mr. Stockwell, I just have one question. Is Maine currently or will propose to prohibit horseshoe crab landings in the state?

MR. STOCKWELL: It's in our legislative to-do list.

CHAIRMAN O'CONNELL: Any discussion on the motion? Mr. Fote.

MR. FOTE: Terry, do you will import horseshoe crabs for bait or do you not do that, because I know we transport from one state to another for horseshoe crabs for conch bait and eel bait and things like that.

MR. STOCKWELL: The state of Maine doesn't use horseshoe crabs.

MR. AUGUSTINE: I was just going to follow on Mr. Fote's comment. Does this mean that you will still issue permits for interstate purposes to your fishermen? I guess I don't understand the concept of just getting out of the management unit as opposed to sitting around the board and participating in the board activities.

It means taking all of your controls – leaving all of all of your controls in place, limited harvest and all the rest of that, if you have any, and that you still have to abide by the Interstate Compact. Whatever the board decides, as long as you still have the same exposure as any other group but you're out of the management unit, then it would seem to me you wouldn't any input or recourse other than to come to the board and say, hey, I've got a problem with that now. I think I need a little more clarification for myself and maybe some others need that, too, or maybe you've said it and I wasn't paying attention, but I've been listening very attentively.

MR. STOCKWELL: Sure. Pat, Maine has no fishery. Licenses are limited and very specifically it's not an open access license. You have to go with the commissioner's interest because it is a license that is regulated through our state legislative process. In order to remove that provision, we have to submit a request to the legislature to have that license to be suspended.

Because of the zero economic returns for the state, we're retasking our scientific staff to probably lobsters or some other need from the Director of Science. Without being able to provide any technical or have any management requests from the board, we're willing to go along with the intent of this board being what it is.

MR. AUGUSTINE: Thank you for that clarification; that helps tremendously.

CHAIRMAN O'CONNELL: Mr. Stockwell, for my own purpose and for the board's purpose, this is on the to-do list for your legislative actions. In the interim if a request is put forward to your commissioner, what do you think the commissioner's action would be on that request?

MR. STOCKWELL: Not to issue the permit.

MR. MILLER: Terry, I'm a little confused. If the principal desire is to avoid allocation of staff time to a species that has no landings and no fishery within your state, I guess I don't understand why it's important to formally withdraw from the board as opposed to just remaining inactive and maybe sending an annual letter saying no landings, no activity, something of that nature.

MR. STOCKWELL: I'm amicable to the pleasure of the board. Certainly, we contribute nothing to this board and staff will contribute nothing to the board. If it's the will of the board for us to send an annual letter saying we're going to contribute that, I would be happy to do so.

MR. HIMCHAK: I tend to agree with Roy's opinion on this because we do have you identified as a reference period landings in the original FMP; and when those reference period landings were developed, it took a lot of digging on behalf of a lot of states to come up with numbers that they never knew existed.

I know you have a very small number under reference period landings, but to me I'd just like to see you included in the FMP and you don't have to invest any time if you have no landings. Is the potential for landings there because the resource is there? I guess it is.

MR. STOCKWELL: The potential for landings will be minimal if there are no licenses. Mr. Chair, I'm good with whatever the board want to do. I just wanted to give the board the heads up of the status of the fishery and the landings in the state. If the board would like Maine to stay as a member of the unit, that's fine. I'll work it with you and Danielle as to the proper process on how to continue.

MR. McKIERNAN: Terry, your state doesn't sit on the sea bass, scup and fluke board?

MR. STOCKWELL: Correct.

MR. McKIERNAN: And in the case of sea bass, I'm sure there are a few that are in your waters and a few

that get landed, so isn't that the analogy that you're trying to establish here?

MR. STOCKWELL: Yes, or tautog or summer flounder, they're not commercial or recreational species for us, but whatever I guess is all I can say.

MR. DOUGLAS GROUT: I certainly would support Terry's request here. Again, we're not on the Red Drum Board either. We have occasional summer – we even have a quota for summer flounder but we're not on the board. We have not declared an interest and I think it's a state's purview not to declare an interest in a board and thus they would not be on the board. If they're requesting no longer to declare an interest, I think with all the consequences that come that such as not issuing licenses and prohibiting landings, they should not have to be on this board.

MR. MILLER: Mr. Chairman, perhaps the way out of this small dilemma would be to defer any action on the Maine request until the legislature takes the anticipated action that Terry told us about, at which point we could take up this topic again and ask Maine if they've had second thoughts or something of that nature in the interim.

CHAIRMAN O'CONNELL: Well, we had the discussion and, Mr. Stockwell, you've heard from the board. I don't know if you want to consider Mr. Miller's suggestion or if somebody wants to amend this motion or we can vote it up or down.

MR. AUGUSTINE: Based on Mr. Miller's comments and other comments around the table, it would only make sense to amend this motion to say at such time as notification from the Maine Legislature that they effectively have taken action – whatever words you from there, help me wordsmith this, and this will stay I want to say limbo – I hate the word “limbo” it's where we're at. Do you want a date certain in it; do you expect action soon? You don't care, okay.

Maine doesn't care so I guess let's do a date certain until the February meeting and then we'll address the issue. When is the legislative session? Postpone it until further notification from the members of the delegation from Maine relative to this issue.

**CHAIRMAN O'CONNELL: We have a motion to postpone until such time that the Maine Legislature has take action to prohibit the landings of horseshoe crabs. We've got a motion by Mr. Augustine; do we have a second? We've**

**got a second by Mr. Ballou.** Discussion by the board. Mr. Himchak.

MR. HIMCHAK: I just had a question on the Maine prohibition on landings because a lot of states have – they have this for personal use only of five per day, and that may still exist in some states. I know the Potomac River Fisheries Commission is still on the Horseshoe Crab Board much to their reluctance. A.C. is not here. I guess, yes, it would depend on what the Maine Legislature says, and then we can make a decision at that point. Is that fair enough?

MR. WILLIAM A. McELROY: Mr. Chairman, I'd like to speak against this postponement. I'm fully in support of Maine making the decision on this, and I think it's the right thing to give them the right to make their decision. I think we're parsing words over nothing and making a big deal out of something that we should almost automatically approve a state's request like this. Thank you.

MR. ADLER: I just want to refer to the song "Hotel California". Terry, you can check out anytime you want but you can never leave. (Laughter)

REPRESENTATIVE DAVID A. WATTERS: I agree; I think that it's perhaps not wise of us to require a legislative body to act so that we can act. You know the legislature, there is no guarantees that we'll ever be satisfied what the legislature may do. I also wonder in terms of our procedures whether this board has to even approve a request or can it be taken directly to the policy board by Maine.

CHAIRMAN O'CONNELL: Well, I think there has been adequate discussion and given the significance of this issue and all the issues that we have to deal with this week, I think we should take some action and move forward. We do have a motion to postpone until such time that the Maine Legislature has taken action to prohibit the landing of horseshoe crabs. Motion by Mr. Augustine and seconded by Mr. Ballou.

All those in favor please raise your right hand; all those opposed please raise your right hand; any abstentions, 1 abstention; any null votes. **The motion fails.** If we could bring up the original motion on the table; the motion is move that the Horseshoe Crab Board recommend to the ISFMP Policy Board that Maine be removed from the management unit. Motion by Mr. Stockwell; seconded by Mr. White. Do you guys need a 30-second caucus on this?

(Whereupon, a caucus was held.)

REPRESENTATIVE CRAIG A. MINOR: I just wonder if maybe a friendly amendment should be "per their request" so it doesn't look like the board is taking some action to weed them off.

MR. STOCKWELL: That's fine.

CHAIRMAN O'CONNELL: All right, move that the Horseshoe Crab Board recommend to the ISFMP Policy Board that Maine be removed from the management unit per Maine's request. Motion by Mr. Stockwell; seconded by Mr. White. All those in favor please raise your right hand; all those opposed please raise your right hand; any abstentions; any null votes. **The motion carries.** I hope to see you periodically.

## ADJOURNMENT

Do I have a motion to adjourn the meeting? So moved; thank you all.

(Whereupon, the meeting was adjourned at 9:05 o'clock a.m., November 9, 2011.)

*Atlantic States Marine Fisheries Commission*

**DRAFT ADDENDUM VII TO THE INTERSTATE FISHERY  
MANAGEMENT PLAN FOR HORSESHOE CRABS  
FOR PUBLIC COMMENT**

*ADAPTIVE RESOURCE MANAGEMENT FRAMEWORK*



*ASMFC Vision Statement:  
Healthy, self-sustaining populations for all Atlantic coast fish species or successful  
restoration well in progress by the year 2015*

November 2011

## Public Comment Process and Proposed Timeline

In August 2011, the Atlantic States Marine Fisheries Commission's Horseshoe Crab Management Board approved a motion to initiate the development of an addendum to the Interstate Fishery Management Plan for Horseshoe Crabs to consider implementing the Adaptive Resource Management Framework for management of the fishery. This draft addendum was presented to the Board in November 2011 and approved for public comment. The draft addendum presents background on the Commission management of horseshoe crabs, the addendum process and timeline, a statement of the problem, and provides horseshoe crab management options for public consideration and comment.

The Board is seeking comments from the public on the following options:

- 1) Should the Board take no action and have management measures revert back to Addendum III?
- 2) Should the Board take action and extend the status quo management measures under Addendum VI?
- 3) Should the Board take action and implement the Adaptive Resource Management Framework? If so,
  - a. How much of each state's harvest is comprised of Delaware Bay-origin crabs,  $\lambda$ ?
  - b. On what basis should the total recommended ARM harvest output be divided among the four states of New Jersey, Delaware, Maryland, and Virginia (Weight allocation- $w_i$ )?
  - c. Should there be an overall cap placed on Maryland and Virginia's harvest to protect non-Delaware Bay-origin horseshoe crabs (Harvest cap)?
  - d. Should there be an allowable harvest of Delaware Bay-origin horseshoe crabs for Maryland and Virginia if the ARM-recommended harvest option requires a moratorium on one or both genders (Delaware Bay Stock Allowance)?

The public is encouraged to submit comments regarding this document at any time during the addendum process. The final date comments will be accepted is **January 31, 2012 at 5:00 pm EST**. Comments may be submitted by mail, email, or fax. If you have any questions or would like to submit comment, please use the contact information below.

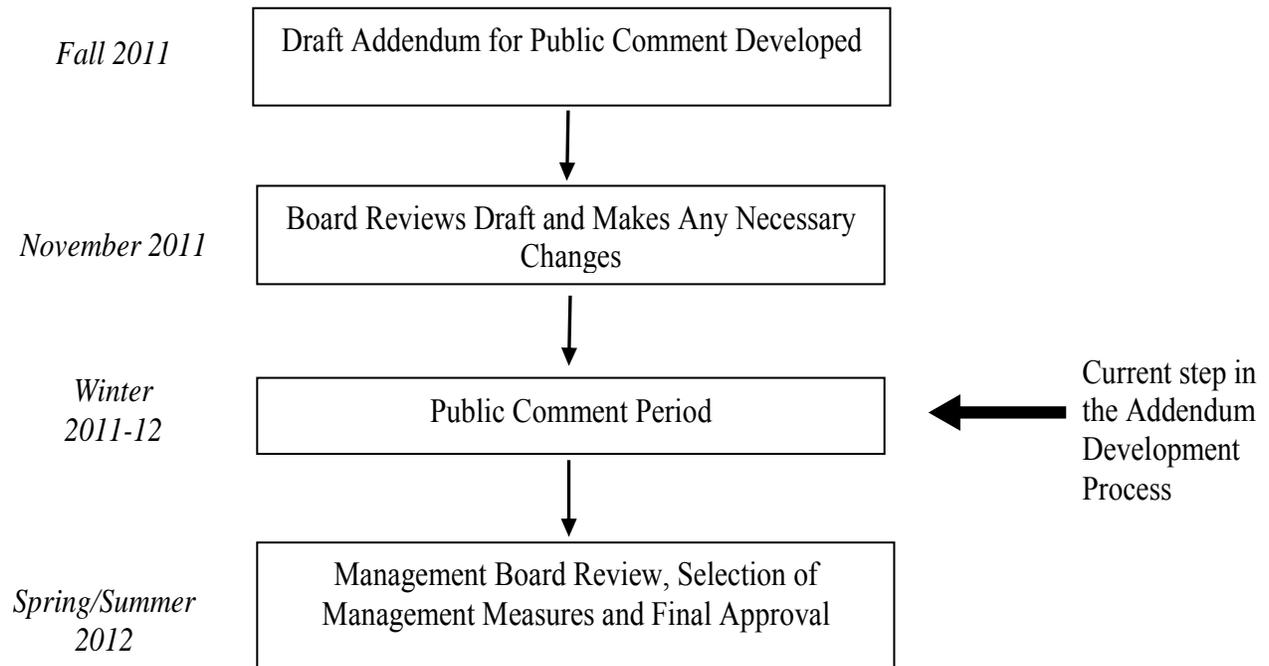
**Mail:** Danielle Brzezinski  
Atlantic States Marine Fisheries Commission  
1050 N. Highland St., Suite 200A-N  
Arlington, VA 22201

**Email:** [dbrzezinski@asmfc.org](mailto:dbrzezinski@asmfc.org)  
(Subject Line: HSC Draft Addendum VII)  
**Fax:** 703.842.0741

If you would like more information, please call Danielle Brzezinski at 703.842.0740.

## ASMFC's Addendum Process and Timeline

The development of Addendum VII to the Horseshoe Crab Fishery Management Plan will follow the general process outlined below. Tentative dates are included to illustrate the timeline of the addendum process.



## **1.0 Introduction**

The Atlantic States Marine Fisheries Commission's (ASMFC) Horseshoe Crab Management Board (Board) approved the Interstate Fishery Management Plan for Horseshoe Crabs (FMP) in October 1998. The goal of the FMP includes management of horseshoe crab populations for continued use by current and future generations of the fishing and non-fishing public, including the biomedical industry, scientific and educational researchers; migratory shorebirds; and, other dependent fish and wildlife, including federally listed sea turtles. ASMFC maintains primary management authority for horseshoe crabs in state and federal waters. The management unit for horseshoe crabs extends from Maine through the east coast of Florida.

Additions and changes to the FMP have been adopted by the Board through various addenda. The Board approved Addendum I (2000), establishing a coastwide, state-by-state annual quota system to reduce horseshoe crab landings. Addendum I also includes a recommendation to the federal government to create the Carl N. Shuster Jr. Horseshoe Crab Reserve. The reserve was established in 2000 as a no-take zone for horseshoe crabs and spans nearly 1,500 square miles of federal waters off the mouth of Delaware Bay. The Board approved Addendum II (2001), establishing criteria for voluntary quota transfers between states. Addenda III (2004) and IV (2006) required additional restrictions on the bait harvest of horseshoe crabs of Delaware Bay-origin and expanded the biomedical monitoring requirements. Addenda V (2008) and VI (2010) extended the restrictions within Addendum IV. The provisions of Addendum VI are set to expire after April 30, 2013. Once expired, the FMP would revert back to the Addendum III requirements unless modifications are enacted.

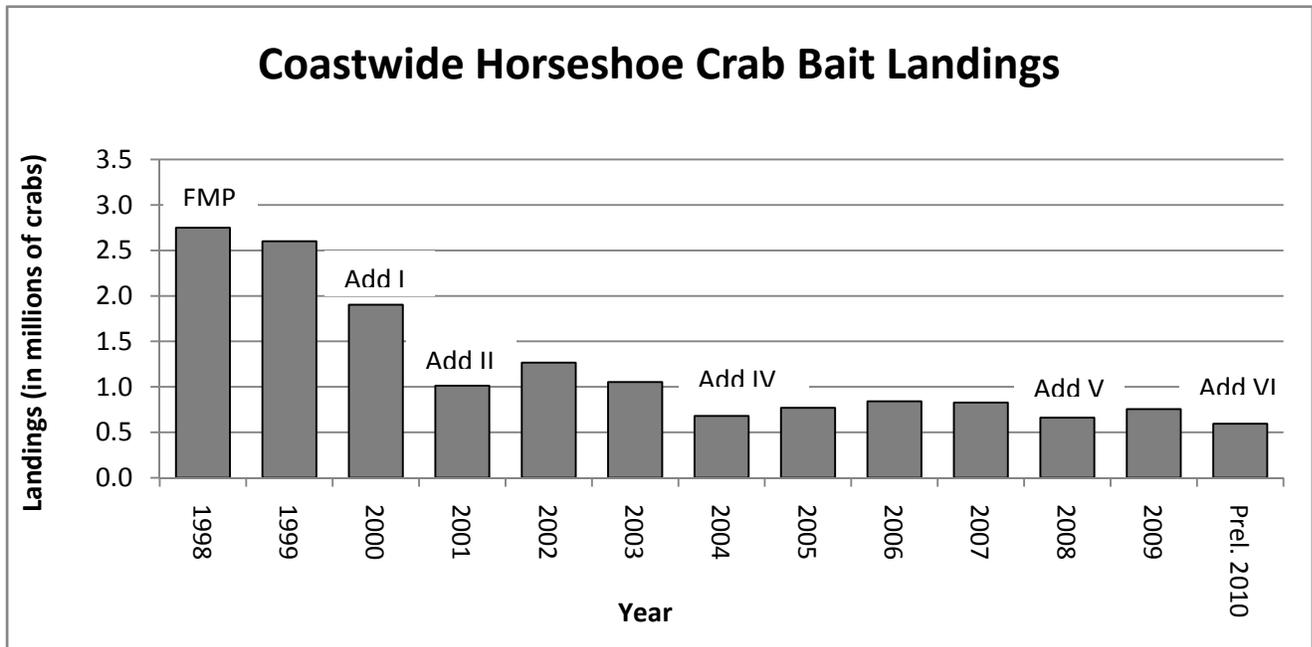
The Board initiated the current Draft Addendum VII to develop and establish a management program for the Delaware Bay Region (i.e., coastal and bay waters of New Jersey and Delaware, and coastal waters only of Maryland and Virginia). The purpose of this document is to provide context for the Board's decisions and solicit public comment on the management options therein.

## **2.0 Management Program**

### **2.1 Statement of the Problem**

This Draft Addendum responds to the ongoing public concern regarding the horseshoe crab population and its ecological role in the Delaware Bay. The 2009 horseshoe crab stock assessment found increases in crab abundance in the Southeast and Delaware Bay Regions and decreases in abundance in the New York and New England Regions, over the respective time series. Following the 2008 fishing season, New York and Massachusetts adjusted their regulations to account for the existing and projected declines in abundance and increased harvest pressure resulting from stricter harvest restrictions in the Delaware Bay during the early to mid-2000s.

While horseshoe crab abundance in the Delaware Bay Region continues rebuilding, the red knot (*rufa* subspecies), one of many shorebird species that feed on horseshoe crab eggs, is at low population levels. Red knots have shown no sign of recovery (Niles et al. 2008) despite a nearly four-fold reduction in horseshoe crab landings since 1998 (Figure 1). Technical advisors



**Figure 1. Atlantic Coastwide Landings of Horseshoe Crabs for Bait**

## 2.2 Background

Provisions of the current Addendum VI expire after April 30, 2013. In order to adopt provisions through the addendum process and avoid a reversion of management to Addendum III, the Board initiated the development of Draft Addendum VII at its August 2011 meeting. The 2009 horseshoe crab stock assessment and 2011 peer review reports provide managers information and recommendations to guide their decision making. In addition, an Adaptive Resource Management (ARM) Framework was completed and accepted by the peer reviewers and Board in 2009. The ARM Framework is designed to assist managers with future horseshoe crab harvest regulations by accounting for multiple species effects, focusing on red knot rebuilding in the Delaware Bay Region.

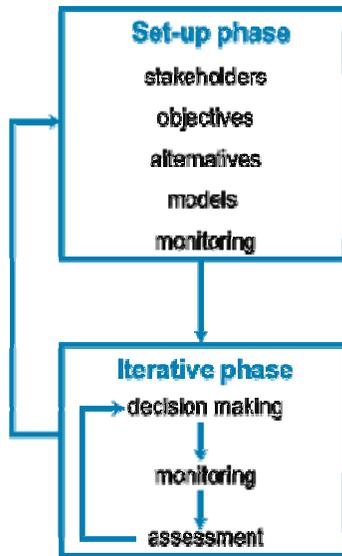
### 2.2.1 ARM Framework

A goal of the ARM Framework is to transparently incorporate the views of stakeholders along with predictive modeling to assess the potential consequences of multiple, alternative management actions in the Delaware Bay Region.

The ARM process involves several steps: 1) identify management objectives and potential actions, 2) build alternative predictive models with confidence values that suggest how a system will respond to these management actions, 3) implement management actions based on those predictive models, 4) monitor to evaluate the population response to management actions, validate the model predictions, and provide timely feedback to update model confidence values and improve future decision making, 5) as necessary, incorporate new data into the models to generate updated, improved predictions, and 6) revise management actions as necessary to reflect

the latest state of knowledge about the ecosystem. ARM is an iterative process that adapts to new information and success of management actions (Figure 2).

Within this ARM Framework, a set of alternative multispecies models have been developed for the Delaware Bay Region to predict the optimal strategy for horseshoe crab bait harvest. These models account for the need for successful red knot stopover feeding during migrations through the region. These models incorporate uncertainty in model predictions and will be updated with new information as monitoring and management progress (Figure 2).



**Figure 2: Double loop learning process of adaptive management** (Williams et. al 2007)

The current harvest packages for horseshoe crab bait harvest, developed through the set-up phase, are:

- Package 1) Full harvest moratorium on both sexes
- Package 2) Harvest up to 250,000 males and 0 females
- Package 3) Harvest up to 500,000 males and 0 females
- Package 4) Harvest up to 280,000 males and 140,000 females
- Package 5) Harvest up to 420,000 males and 210,000 females

The numbers of horseshoe crabs in the alternatives listed above are totals for the Delaware Bay Region, and not per state. Harvest alternative #4 approximately reflects current bait harvest allowance in the region.

### **2.3 Allocation of the ARM harvest output**

The ARM Framework incorporates horseshoe crabs from the Delaware Bay Region as one unit. The modeling and optimization portions of the Framework do not address distribution and allocation of the harvest among the four Delaware Bay states. Options for allocation are incorporated into this document. Based on tagging (Swan 2005, USFWS 2011) and genetic analysis (Pierce et al. 2000, Shuster 1985), there is very little exchange between Chesapeake Bay

and Delaware Bay populations. However, there is movement of horseshoe crabs between coastal embayments (from New Jersey through Virginia) and Delaware Bay (Shuster 1985).

An allocation model for the four Delaware Bay states was developed to allocate the optimized harvest output by the ARM Framework. The model includes four components, on which public comment is being sought. These components include:

1) How much of each state's harvest is comprised of Delaware Bay-origin crabs, Lambda  $\lambda$ ?

New Jersey, Delaware, Maryland, and Virginia all draw some portion of their yearly quota from Delaware Bay crabs. For New Jersey and Delaware, this level is assumed to be 100%; that is, all horseshoe crabs harvested by fishermen in New Jersey and Delaware come from the Delaware Bay population. This assumption is likely correct, as most of the fishery occurs by hand on the spawning beaches or during the spawning period, and thus the crabs are in the Delaware Bay at that time to spawn. Their lambda values,  $\lambda$ , would equal one (1.0).

For Maryland and Virginia, the proportion of crabs is not as straight-forward to assess. Both states have spawning areas along their coasts and within the Chesapeake Bay that support separate spawning aggregations. Tagging data and genetics studies offer information on the movement and origins of crabs. The U.S. Fish and Wildlife Service (USFWS) tagging program, operating since 1999, is the longest time series for horseshoe crab tagging data. The program experienced a large increase in participation in 2008, when the number of released tags jumped nearly 3-fold in a single year. In 2009, four new tagging programs were implemented in Massachusetts, New York/New Jersey (the Raritan/Sandy Hook Bays), Georgia (near Wassaw Island), and the upper Chesapeake Bay. Tagging data through 2010 revealed that over 165,000 horseshoe crabs had been tagged and 17,000 of those tagged crabs were recaptured.

The tagging data were analyzed according to tag recovery rate, which is the probability that a tagged individual in one area will be recaptured in another area. This probability is a function of survival, the probability of moving from one area to another, and the likelihood of being recaptured. Recapture of crabs within three months (generally includes the same spawning season) were not included. Much of the tagging and recapture data fall within these parameters for Delaware Bay, thus limiting the amount of information available on the degree of population mixing along the coast.

Genetics data also have the potential to provide insight into different populations of horseshoe crabs. By screening microsatellite DNA markers, researchers can estimate levels of genetic relatedness among different groups of crabs. An "assignment" procedure, performed for the Delaware Bay Ecosystem Technical Committee's analysis, was used to examine the genetic composition of sampled horseshoe crabs to determine the most likely mix of source populations for the sample. As part of the genetics analysis where different source populations were identified, it was noted that low levels of genetically effective migration, or breeding across populations, can maintain genetic similarity.

2) On what basis should the total recommended ARM harvest output be divided among the four states of New Jersey, Delaware, Maryland, and Virginia (Weight allocation- $w_i$ )?

Based on the optimized harvest level, a total Delaware Bay horseshoe crab harvest will be set. The weighting system used will determine how that harvest will be apportioned among the four states of New Jersey, Delaware, Maryland and Virginia. Possibilities include historic harvest levels, current quota levels, estimated abundance levels, and average landings. The Reference Period Landings (RPLs) represent the historic distribution of the catch, and presumably, the historic distribution of the fishery. The current quota levels, as set by Addendum VI, recognize the current distribution of quota among the four states. The annual Virginia Tech Horseshoe Crab Trawl Survey can estimate state waters' abundance based on location of the survey trawls, although the survey was not specifically designed for state-by-state estimates. Average landings represent the regulation- and market-controlled catch for each state, averaged over the past four years. It is important to note that New Jersey instituted a state-wide moratorium on bait harvest and landings since 2007, which reduces their average harvest over the past four years to zero.

All options are impacted by the lambda values chosen for use.

3) Should there be an overall harvest cap placed on Maryland and Virginia's harvest to protect non-Delaware Bay-origin horseshoe crabs (Harvest cap)?

Placing a cap on the total allowed harvest within Maryland and Virginia (harvest east of the COLREGS line) would prevent increases in the harvest of non-Delaware Bay crabs. This is currently possible, as Maryland and Virginia harvest crabs from a mixed population. Thus, a cap would protect non-Delaware Bay crab populations. The basis for the cap can include past effort, landing levels or caps from past management addenda.

4) Should there be an allowable harvest of Delaware Bay-origin horseshoe crabs for Maryland and Virginia if the ARM-recommended harvest option requires a moratorium on one or both genders (Delaware Bay Stock Allowance)?

The Delaware Bay Stock Allowance decision is only relevant should the ARM model suggest a harvest package that has either a full or female-only moratorium AND should the Lambda values for Maryland and Virginia be set at some value less than 1.0. The current recommended ARM harvest package, Package 3 (500,000 male crabs only, see Section 2.2.1), contains a female-only moratorium, and general technical and advisory consensus is that Maryland and Virginia fisheries target a "mixed stock" of horseshoe crabs that originate from the Delaware Bay and elsewhere.

This option, if chosen, would still allow Maryland and Virginia to harvest some Delaware Bay-origin horseshoe crabs that are under a moratorium (e.g. females under Harvest Package 3) at a defined minimal level. The option recognizes that at least some portion of the Maryland and Virginia harvest is composed of non-Delaware Bay-origin crabs. Without this option, a moratorium on Delaware Bay-origin crabs would impose a similar moratorium on Maryland and Virginia's harvests of non-Delaware Bay-origin crabs. Use of the allowance recognizes that a certain number of Delaware Bay-origin crabs may still be caught by Maryland and Virginia along with non-Delaware Bay-origin crabs.

Proposed values for the Delaware Bay Stock Allowance have included 1%, 5%, and 10% (~current female harvest under Addendum VI) of the two-year averaged coastwide harvest, as well as of the two-year averaged Delaware Bay states' harvest. Proposed implementation includes the option to maintain overall harvest at the level of the harvest cap, with no decrease in total crab harvest compared to the harvest cap. An additional option includes offsetting lost female harvest with male crabs at a 2:1 ratio, thus allowing two male crabs to be harvested for every female crab that is not allowed, according to previous quota levels under Addendum VI.

## **2.4 Management Options**

The Board may select a management option contained in this draft document or an option that is within the range of options presented below.

### Option 1: No Action (Revert to Addendum III provisions)

If the Management Board chooses to not take action on Draft Addendum VII, horseshoe crab management for the Delaware Bay Region would revert to the Commercial Fisheries Management provisions of Addendum III. Addendum III permitted annual bait harvest and landing of up to 150,000 crabs total (male and female) in New Jersey and Delaware, and an annual bait harvest and landing of up to 170,653 crabs total (male and female) in Maryland. Under Addendum III, Virginia's annual bait harvest and landings would remain the same as under Addendum VI; however, the requirement to land no more than 40% of the total quota (60,998 crabs) with a 2:1 male:female ratio east of the COLREGS line would be removed. In addition, for these states Addendum III prohibited harvest and landing for bait from May 1 through June 7.

### Option 2: Status Quo (Continuation of Addendum VI management provisions)

This option prohibits directed bait harvest and landing of all horseshoe crabs in New Jersey and Delaware from January 1 through June 7, and female horseshoe crabs in New Jersey and Delaware from June 8 through December 31. It also limits New Jersey and Delaware's bait harvest to 100,000 horseshoe crabs (male only) per state per year.

It also prohibits directed harvest and landing of horseshoe crabs for bait in Maryland from January 1 through June 7, and the landing of horseshoe crabs in Virginia, harvested from federal waters, from January 1 through June 7. No more than 40% of Virginia's annual quota may be harvested east of the COLREGS line in ocean waters. It also requires that horseshoe crabs harvested east of the COLREGS line and landed in Virginia be comprised of a minimum male to female ratio of 2:1.

- Option 2a: These provisions are to remain in place until replaced through another addendum process.
- Option 2b: These provisions are to expire one year after the date of implementation.
- Option 2c: These provisions are to expire three years after the date of implementation.
- Option 2d: These provisions are to expire five years after the date of implementation.

### Option 3: Management Using the ARM Framework

If this option is chosen, the ARM Working Group would present to the Board at its August 2012 meeting the optimal harvest package as identified by the models (i.e. one of the five harvest quota alternatives listed in Section 2.2.1). The Board would review the harvest package and allocate the bait harvest quota among the four states (New Jersey through Virginia [only harvest east of the COLREGS line]) that comprise the Delaware Bay Region, according to the allocation spreadsheet model. Although each of the decision options in the allocation model is presented separately, they interact with each other when calculating the final allocation values.

Annual management decision making would determine the following year's ( $t + 1$ ) harvest requirements by populating the ARM models with horseshoe crab data from the previous year ( $t - 1$ ) and shorebird data from the current year ( $t$ ). This exercise is expected to occur in August at the Commission's Summer meeting.

If this option is chosen, implementation of the ARM Framework could occur after the August 2012 Board meeting and would be comprised of two cycles (i.e., double loop learning; Figure 2): 1) *Annual Cycle* (i.e., the 'iterative phase'); and 2) *Longer Term Cycle* (i.e., revisiting the 'set-up phase' every 3 or 4 years, likely coordinating the first review with the stock assessment).

#### *Annual Cycle*

- ASMFC Summer Meeting (year  $t$ ) – Board decides harvest
- June (year  $t + 1$ ) – Delaware Bay Ecosystem Technical Committee compiles monitoring data
- July (year  $t + 1$ ) – ARM Working Group runs models/optimization
- ASMFC Summer Meeting (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 the relevant technical committees
- Technical committees review stakeholder input and technical components of ARM models and provide recommendations to the Board
- At the ASMFC Spring Meeting, Board selects final components of the ARM Framework, and tasks technical committees to work with ARM Working Group to run models /optimization
- Merge with the *Annual Cycle*
  - In July, ARM Working Group runs models/optimization
  - At the ASMFC Summer Meeting, the Board revisits harvest decision

*Allocation:* Multiple choices exist for each of the allocation sub-options (3a – 3d), which would allocate the ARM optimized harvest output among the four Delaware Bay states.

Option 3a: What option for lambda ( $\lambda$ ) best represents how much of each state's horseshoe crab harvest originates in Delaware Bay?

Lambda indicates how much of a state’s harvest is of Delaware Bay-origin (i.e. has spawned at least once in Delaware Bay). Options for lambda ( $\lambda$ ) values for the four states include those based on tagging data (#1), a risk-averse default option (#2), and those based on genetics data (#3).

#1: Tagging data

| State     | Lambda, $\lambda$ |
|-----------|-------------------|
| NJ        | 1.0               |
| DE        | 1.0               |
| <b>MD</b> | <b>0.13</b>       |
| <b>VA</b> | <b>0.09</b>       |

#2: Default values

| State     | Lambda, $\lambda$ |
|-----------|-------------------|
| NJ        | 1.0               |
| DE        | 1.0               |
| <b>MD</b> | <b>1.0</b>        |
| <b>VA</b> | <b>1.0</b>        |

#3: Genetics data

| State     | Lambda, $\lambda$ |
|-----------|-------------------|
| NJ        | 1.0               |
| DE        | 1.0               |
| <b>MD</b> | <b>0.51</b>       |
| <b>VA</b> | <b>0.35</b>       |

Option 3b: On what basis should the total recommended ARM harvest output be divided among the four states of New Jersey, Delaware, Maryland, and Virginia (Weight allocation- $w_i$ )?

Weight allocation values among the four states are presented with four options: historic landings, current quota levels, estimated abundance levels, and average landings. Virginia’s quota level and landings referred to throughout Option 3 only refer to those quota and landings that occur east of the COLREGS line, as these crabs have been shown to be part of a mixed stock (Shuster 1985). Note that these values are impacted, as well, by the chosen Lambda values.

1) Historical, unregulated harvest levels (Reference Period Landings):

| State     | Allocation weight, $w_i$ |                   |                   |
|-----------|--------------------------|-------------------|-------------------|
|           | Genetics $\lambda$       | Tagging $\lambda$ | Default $\lambda$ |
| <b>NJ</b> | 41.1%                    | 51%               | 25%               |
| <b>DE</b> | 32.8%                    | 41%               | 32%               |
| <b>MD</b> | 21.3%                    | 7%                | 32%               |
| <b>VA</b> | 4.8%                     | 1%                | 11%               |

2) Current management quotas (Addendum VI):

| State     | Allocation weight, $w_i$ |                   |                   |
|-----------|--------------------------|-------------------|-------------------|
|           | Genetics $\lambda$       | Tagging $\lambda$ | Default $\lambda$ |
| <b>NJ</b> | 32.4%                    | 44%               | 23%               |
| <b>DE</b> | 32.4%                    | 44%               | 23%               |
| <b>MD</b> | 28.2%                    | 10%               | 40%               |
| <b>VA</b> | 7.0%                     | 2%                | 14%               |

3) Current estimated abundance levels (Virginia Tech Horseshoe Crab Trawl Survey):

| State     | Allocation weight, $w_i$ |                   |                   |
|-----------|--------------------------|-------------------|-------------------|
|           | Genetics $\lambda$       | Tagging $\lambda$ | Default $\lambda$ |
| <b>NJ</b> | 28%                      | 28%               | 28%               |
| <b>DE</b> | 47%                      | 47%               | 47%               |
| <b>MD</b> | 18%                      | 18%               | 18%               |
| <b>VA</b> | 7%                       | 7%                | 7%                |

4) Past four years' average landings:

| State     | Allocation weight, $w_i$ |                   |                   |
|-----------|--------------------------|-------------------|-------------------|
|           | Genetics $\lambda$       | Tagging $\lambda$ | Default $\lambda$ |
| <b>NJ</b> | 0%                       | 0%                | 0%                |
| <b>DE</b> | 46%                      | 77%               | 29%               |
| <b>MD</b> | 45%                      | 19%               | 56%               |
| <b>VA</b> | 9%                       | 4%                | 15%               |

Option 3c: Should there be an overall harvest cap placed on Maryland and Virginia's harvest to protect non-Delaware Bay-origin horseshoe crabs (harvest cap)? If yes, what timeframe or management period should be used to establish the cap ?

The harvest cap would place a maximum limit on the total level of allowed harvest by Maryland and Virginia, providing protection to non-Delaware Bay-origin crabs. Cap levels may be based on past management measures or landings levels. A cap based on the Reference Period Landings or Addendum I levels would do little to limit harvest levels, except in extreme circumstances.

Addenda III and VI are similar, except that Addendum VI specifies a limit on Virginia harvest east of the COLREGS line. Average landings would provide the strictest cap.

Note again that Virginia’s current quota is based on that amount able to be harvested east of the COLREGS line.

| Cap Basis              | Current MD quota<br>170,653 | Current VA quota<br>60,998 |
|------------------------|-----------------------------|----------------------------|
|                        | MD Cap                      | VA Cap                     |
| RPLs                   | 613,225                     | 203,326                    |
| Add I                  | 459,919                     | 152,495                    |
| Add III                | 170,653                     | 152,495                    |
| Add VI                 | 170,653                     | 60,998                     |
| 2007-2010 Avg Landings | 160,746                     | 21,280                     |

Option 3d: Should there be an allowable harvest of Delaware Bay-origin horseshoe crabs for Maryland and Virginia if the ARM-recommended harvest option requires a moratorium on one or both genders (Delaware Bay Stock Allowance) and at what level should that harvest be set?

A Delaware Bay Stock Allowance (DBSA) would allow continued harvest of females by Maryland and Virginia under the recommended Harvest Package 3 female moratorium (no impact on New Jersey or Delaware as these fisheries are considered to be completely comprised of Delaware Bay-origin crabs). The options include 0% (no Delaware Bay Stock Allowance), 1%, 5%, and 10% (~status quo). The levels are impacted by the values for the other three decisions. If the default Lambda values are chosen, it is assumed that all crabs harvested in Maryland and Virginia (east of the COLREGS) are of Delaware Bay-origin, and thus there would be no Delaware Bay Stock Allowance. The corresponding male quota is shown parentheses, indicating that even if the female quota is decreased, the total quota (allowed under the harvest cap and other management conditions) will not decrease.

Add. VI Harvest cap, 1:1 male:female ratio cap of 85,327, male quota in parentheses (10% Delaware Bay Stock Allowance originally based on maintaining Maryland’s self-imposed 2:1 male:female ratio: 56,885 crabs)

| % of coastwide | Maryland Total Female Quota, Option #3 for Lambda (0.51) |                          |                                 |                               |
|----------------|--|--------------------------|---------------------------------|-------------------------------|
|                | W <sub>i</sub> = RFPs                                    | W <sub>i</sub> = Add. VI | W <sub>i</sub> = Est. Abundance | W <sub>i</sub> = Av. Landings |
| 0%             | 0 (170,653)  | 0 (170,653)              | 0 (170,653)                     | 0 (170,653)                   |
| 1%             | 5,395 (165,258)  | 5,318 (165,335)          | 4,688 (165,965)                 | 5,581 (165,072)               |
| 5%             | 26,973 (143,680)   | 26,589 (144,064)         | 23,442 (147,211)                | 27,906 (142,747)              |
| 10%            | 53,946 (116,707)   | 53,177 (117,476)         | 46,885 (123,768)                | 55,813 (114,840)              |

| % of coastwide | Maryland Total Female Quota, Option #1 for Lambda (0.13) |                          |                                 |                               |
|----------------|--|--------------------------|---------------------------------|-------------------------------|
| DBSA level     | W <sub>i</sub> = RFPs                                    | W <sub>i</sub> = Add. VI | W <sub>i</sub> = Est. Abundance | W <sub>i</sub> = Av. Landings |
| 0%             | 0 (170,653)  | 0 (170,653)              | 0 (170,653)                     | 0 (170,653)                   |
| 1%             | 21,129 (149,524)   | 20,826 (149,827)         | 18,393 (152,260)                | 21,866 (148,787)              |
| 5%             | 85,327* (85,326)   | 85,327* (85,326)         | 85,327* (85,326)                | 85,327* (85,326)              |
| 10%            | 85,327* (85,326)   | 85,327* (85,326)         | 85,327* (85,326)                | 85,327* (85,326)              |

\*Female cap reached

Add. VI Harvest cap, 2:1 male:female ratio cap of 20,333, male quota in parentheses

| % of coastwide | Virginia Total Female Quota, Option #3 for Lambda (0.35) |                          |                                 |                               |
|----------------|--|--------------------------|---------------------------------|-------------------------------|
| DBSA level     | W <sub>i</sub> = RFPs                                    | W <sub>i</sub> = Add. VI | W <sub>i</sub> = Est. Abundance | W <sub>i</sub> = Av. Landings |
| 0%             | 0 (60,998)   | 0 (60,998)               | 0 (60,998)                      | 0 (60,998)                    |
| 1%             | 1,789 (59,209)   | 1,901 (59,097)           | 2,818 (58,180)                  | 1,517 (59,481)                |
| 5%             | 8,943 (52,055)   | 9,504 (51,494)           | 14,088 (46,910)                 | 7,583 (53,415)                |
| 10%            | 17,887 (43,111)  | 19,008 (41,990)          | 20,333* (40,665)                | 15,167 (45,831)               |

| % of coastwide | Virginia Total Female Quota, Option #1 for Lambda (0.09) |                          |                                 |                               |
|----------------|--|--------------------------|---------------------------------|-------------------------------|
| DBSA level     | W <sub>i</sub> = RFPs                                    | W <sub>i</sub> = Add. VI | W <sub>i</sub> = Est. Abundance | W <sub>i</sub> = Av. Landings |
| 0%             | 0 (60,998)   | 0 (60,998)               | 0 (60,998)                      | 0 (60,998)                    |
| 1%             | 7,006 (53,992)   | 7,444 (53,554)           | 10,957 (50,041)                 | 5,942 (55,056)                |
| 5%             | 20,333* (40,665)   | 20,333* (40,665)         | 20,333* (40,665)                | 20,333* (40,665)              |
| 10%            | 20,333* (40,665)   | 20,333* (40,665)         | 20,333* (40,665)                | 20,333* (40,665)              |

\*Female cap reached

Option 3e: Should the Delaware Bay Stock Allowance include a 2:1 male:female offset for female crabs below the Addendum VI levels?

This option would implement the Delaware Bay Stock Allowance according to the same aspects of Option 3d, impacting only the harvests of Maryland and Virginia due to their mixed-stock fishery. For female crab harvest that is restricted below the Addendum VI quota levels, male harvest would be increased at a 2:1 ratio. Thus, if no Delaware Bay Stock Allowance is chosen and the harvest cap is set at Addendum VI levels (170,653 crabs for Maryland and 60,998 crabs for Virginia), the total harvest for each state would be 255,890 male crabs for Maryland (170,653 base + 85,327 in offset) and 81,331 male crabs for Virginia (60,998 base + 20,333 in offset). These increases would be the only allowable increases above any designated harvest cap chosen in Option 3c. As in Option 3d, the options for the Delaware Bay Stock Allowance level include 0% (no Delaware Bay Stock Allowance), 1%, 5%, and 10% (~status quo). The levels are impacted by the values for the other three decisions. If the default Lambda values are chosen, it is assumed that all crabs harvested in Maryland and Virginia (east of the COLREGS) are of Delaware Bay-origin, and thus there would be no Delaware Bay Stock Allowance. The corresponding male quota is shown parentheses.

Add. VI Harvest cap, 1:1 male:female ratio cap of 85,327, male quota in parentheses  
(10% Delaware Bay Stock Allowance originally based on maintaining Maryland's self-imposed  
2:1 male:female ratio: 56,885 crabs)

| % of coastwide | Maryland Total Female Quota, Option #3 for Lambda (0.51) |                          |                                 |                               |
|----------------|--|--------------------------|---------------------------------|-------------------------------|
|                | W <sub>i</sub> = RFPs                                    | W <sub>i</sub> = Add. VI | W <sub>i</sub> = Est. Abundance | W <sub>i</sub> = Av. Landings |
| 0%             | 0 (255,890)  | 0 (255,890)              | 0 (255,890)                     | 0 (255,890)                   |
| 1%             | 5,395 (245,190)  | 5,318 (245,344)          | 4,688 (246,604)                 | 5,581 (244,818)               |
| 5%             | 26,973 (202,034)   | 26,589 (202,802)         | 23,442 (209,096)                | 27,906 (200,168)              |
| 10%            | 53,946 (148,808)   | 53,177 (149,626)         | 46,885 (162,210)                | 55,813 (144,354)              |

| % of coastwide | Maryland Total Female Quota, Option #1 for Lambda (0.13) |                          |                                 |                               |
|----------------|--|--------------------------|---------------------------------|-------------------------------|
|                | W <sub>i</sub> = RFPs                                    | W <sub>i</sub> = Add. VI | W <sub>i</sub> = Est. Abundance | W <sub>i</sub> = Av. Landings |
| 0%             | 0 (255,890)  | 0 (255,890)              | 0 (255,890)                     | 0 (255,890)                   |
| 1%             | 21,129 (213,722)   | 20,826 (214,328)         | 18,393 (219,194)                | 21,866 (212,248)              |
| 5%             | 85,327* (85,326)   | 85,327* (85,326)         | 85,327* (85,326)                | 85,327* (85,326)              |
| 10%            | 85,327* (85,326)   | 85,327* (85,326)         | 85,327* (85,326)                | 85,327* (85,326)              |

\*Female cap reached

Add. VI Harvest cap, 2:1 male:female ratio cap of 20,333, male quota in parentheses

| % of coastwide | Virginia Total Female Quota, Option #3 for Lambda (0.35) |                          |                                 |                               |
|----------------|--|--------------------------|---------------------------------|-------------------------------|
|                | W <sub>i</sub> = RFPs                                    | W <sub>i</sub> = Add. VI | W <sub>i</sub> = Est. Abundance | W <sub>i</sub> = Av. Landings |
| 0%             | 0 (81,331)   | 0 (81,331)               | 0 (81,331)                      | 0 (81,331)                    |
| 1%             | 1,789 (77,753)   | 1,901 (77,529)           | 2,818 (75,695)                  | 1,517 (78,297)                |
| 5%             | 8,943 (63,445)   | 9,504 (62,323)           | 14,088 (53,155)                 | 7,583 (66,165)                |
| 10%            | 17,887 (45,557)  | 19,008 (43,315)          | 20,333* (40,665)                | 15,167 (50,997)               |

| % of coastwide | Virginia Total Female Quota, Option #1 for Lambda (0.09) |                          |                                 |                               |
|----------------|--|--------------------------|---------------------------------|-------------------------------|
|                | W <sub>i</sub> = RFPs                                    | W <sub>i</sub> = Add. VI | W <sub>i</sub> = Est. Abundance | W <sub>i</sub> = Av. Landings |
| 0%             | 0 (81,331)   | 0 (81,331)               | 0 (81,331)                      | 0 (81,331)                    |
| 1%             | 7,006 (67,319)   | 7,444 (66,443)           | 10,957 (59,417)                 | 5,942 (69,447)                |
| 5%             | 20,333* (40,665)   | 20,333* (40,665)         | 20,333* (40,665)                | 20,333* (40,665)              |
| 10%            | 20,333* (40,665)   | 20,333* (40,665)         | 20,333* (40,665)                | 20,333* (40,665)              |

\*Female cap reached

Option 3f: If the data used to implement the ARM Framework becomes unavailable, should the Commission include a fallback option??

As part of the ARM Framework, the models are dependent on annual data sets for the yearly harvest setting, and include the following:

- Horseshoe crab abundance estimates from the Virginia Tech Horseshoe Crab Trawl Survey
- Red knot abundance estimates, including stopover counts and re-sightings, from the Delaware Bay Shorebird Project

There are additional data needs for the ARM Framework's double-loop process, such as the proportion of horseshoe crabs spawning during shorebird stopover and sex ratios from the Delaware Bay horseshoe crab spawning survey; however, it is the annual data sets that are required to maintain the yearly harvest outputs.

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 Board, via Board action, may set the next season's harvest:

- Based upon Addendum VI quotas and management measures for New Jersey, Delaware, and Maryland, and Virginia coastal waters; or,
- Based upon the previous year's ARM Framework harvest level and allocation for New Jersey, Delaware, and Maryland, and Virginia coastal waters.

### **3.0 Compliance**

Affected states must implement this Addendum no later than the following dates:

XXXXXXX: States must submit state programs to implement Addendum VII, including management and monitoring programs, for approval by the Management Board.

XXXXXXX: States with approved management and monitoring programs shall begin implementing Addendum VII.

#### 4.0 Literature Cited

- Niles, L. J., H. P. Sitters, A. D. Dey, P. W. Atkinson, A. J. Baker, K. A. Bennett, R. Carmona, K. E. Clark, N. A. Clark, C. Espoza, P. M. Gonzalez, B. A. Harrington, D. E. Hernandez, K. S. Kalasz, R. G. Lathrop, Ricardo N. Matus, C. D. T. Minton, R. I. G. Morrison, M. K. Peck, W. Pitts, R. A. Robertson and I. L. Serrano. 2008. Status of the Red Knot in the Western Hemisphere. *Studies in Avian Biology* No. 36.
- Pierce, J., G. Tan, and P. Gaffney. 2000. Delaware Bay and Chesapeake Bay populations of the horseshoe crab *Limulus polyphemus* are genetically distinct. *Estuaries* 23: 690-698.
- Shuster, C.N., Jr. 1985. Introductory remarks on the distribution and abundance of the horseshoe crab, *Limulus polyphemus*, spawning in the Chesapeake Bay area. Pages 34-38 in *The Chesapeake: Prologue to the Future*. Proceedings of the Chesapeake Bay Symposium, National Marine Educators Conference.
- Swan, B. L. 2005. Migrations of adult horseshoe crabs, *Limulus polyphemus*, in the middle Atlantic bight: a 17-year tagging study. *Estuaries* 28: 28-40.
- United States Fish and Wildlife Service (USFWS). 2011. Horseshoe Crab Tagging Program. Report to the Atlantic States Marine Fisheries Commission Delaware Bay Ecosystem Technical Committee (January 24, 2011). 6 pgs.
- Williams, B. K., R. C. Szaro, and C. D. Shapiro. 2007. Adaptive management: the US Department of the Interior technical guide. Adaptive Management Working Group, U.S. Department of the Interior, Washington, DC.

## Shorebird Advisory Panel Report

November 30, 2011

### **Participants**

Dr. Sarah Karpanty (VA Tech), Chair  
Dr. Jean Woods (DE)  
Chris Bennett (DE)  
Dr. David Mizrahi (NJ)  
Tim Dillingham (NJ)  
Danielle Chesky (ASMFC)

The Shorebird Advisory Panel (AP) met via conference call on November 30, 2011, to review the Draft Addendum VII to the Horseshoe Crab Fishery Management Plan. The AP 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 AP had previously reviewed suboptions 3a-d under Option 3 in May 2011. The AP agreed that no new science had been brought forth that would suggest a difference of opinion from those opinions. The summarized recommendations have been copied below for reference.

#### *Option 3a, Lambda*

Based on the available science and the reliability of the science behind the three methods, the AP agreed with the DBETC and recommends the lambda values be based on the genetics data.

#### *Option 3b, Weighting allocation*

The AP recommends basing the allocation weight on the Addendum IV quota levels.

#### *Option 3c, Harvest cap*

The AP agrees with the DBETC and recommends a harvest cap based on Addendum IV quota allocations to cap the non-Delaware Bay harvest of Maryland and Virginia.

#### *Option 3d, Delaware Bay Stock Allowance*

The AP recommends that the Board maintain the ARM optimized harvest and its moratorium on Delaware Bay female horseshoe crabs. Given the inability to discriminate in the field between Delaware Bay and other horseshoe crab populations, this moratorium will impose a moratorium on the harvest of female crabs in Maryland and Virginia as well, which harvest crabs from a recognized mixed stock. The AP maintains that this approach will allow for the most efficient and clear measure of the ARM's impacts and the ecosystem's response to its recommended measures.

#### *Option 3e, Delaware Bay Stock Allowance with additional 2:1 male:female offset*

The AP maintains their recommendation that the Board maintain the ARM optimized harvest and its moratorium on Delaware Bay female horseshoe crabs. By doing so, this approach will allow for the most efficient and clear measure of the ARM's impacts and the ecosystem's response to its recommended measures. The AP also expressed concern about the increases over the current quota levels for Maryland and Virginia that would be allowed if this option were put into practice. There is currently little data on these other stocks and whether or not these stocks could withstand an increase in fishing pressure.

### *Option 3f, Plan B for management*

The AP agreed that the Board should consult the APs and the Delaware Bay Ecosystem Technical Committee prior to making any decision. The AP also believes that limiting the choices to previous management measures under Addendum VI or the past year's ARM-recommended measures would be a premature decision. Thus, the AP suggests the following language for Option 3f, which will allow the APs and the TC 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 AP again expressed concern about the impacts of deviating from the ARM-recommended harvest. The AP felt that these deviations would complicate assessing the impacts of the ARM Framework on the populations of horseshoe crabs and red knots.

1) *Lambda,  $\lambda$*

**The AP recommends lambda values based on the genetics data (Option 3).**

2) *Allocation weights,  $w_i$*

**The AP recommends basing the allocation weights on the Addendum IV quota levels.**

3) *Harvest cap for Maryland and Virginia*

**The AP recommends basing a harvest cap for Maryland and Virginia on Addendum IV quota levels.**

4) *Delaware Bay Stock Allowance (DBSA)*

**The AP recommends maintaining the ARM optimized harvest recommendation of a female moratorium on Delaware Bay crabs.**

5) *Delaware Bay Stock Allowance with 2:1 male:female offset.*

**The AP recommends maintaining the ARM optimized harvest recommendation of a female moratorium on Delaware Bay crabs and recommends against allowing any increased catch on non-Delaware Bay crabs.**

6) *Plan B for management*

**The AP recommends that should the necessary annual data to run the ARM model not be available, the Board consult the Delaware Bay Ecosystem Technical Committee, Shorebird Advisory Panel, and Horseshoe Crab Advisory Panel to review the available data and recommend a management approach.**



# Atlantic States Marine Fisheries Commission

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## MEMORANDUM

TO: Horseshoe Crab Management Board  
FROM: Mark Robson, Law Enforcement Committee Coordinator  
SUBJECT: Comments on Draft Addendum VII  
DATE: January 3, 2012

Members of the Law Enforcement Committee (LEC) of the Atlantic States Marine Fisheries Commission would like to offer comments regarding management options in Draft Addendum VII to the Interstate Fishery Management Plan for Horseshoe Crabs that were prepared for public comment in November 2011.

Four general conditions affect current enforcement. First, the State of New Jersey does not allow any harvest or possession of crabs for bait unless they are from another state and can be documented as such. Second, in Delaware, the primary harvest is by hand from the beaches. Enforcement efforts are focused on beaches and fish houses during harvest seasons. Third, in Maryland and Virginia, more harvest occurs by vessels. This typically involves more opportunity, and thus more challenge, for at-sea compliance checks. Fourth, in all states there are reporting requirements in place to ensure reasonable self-reporting by harvesters and dealers.

Enforcement needs in New Jersey and Delaware revolve around adequate patrol and presence at shore side landing points during any open and closed periods. The most feasible enforcement is to ensure that crabs are not taken during closed periods, and that harvesters are properly permitted. New Jersey enforces a complete moratorium on harvest. In Delaware, officers in the field must be able to ensure that only male crabs are being harvested during open harvests of June 8 through December 31<sup>st</sup>. Shore side enforcement at key places and periods can be effective, but is labor intensive.

For Maryland and Virginia, enforcement includes more at-sea opportunity because of the larger trawl fishery in those waters relative to hand harvest. In addition to monitoring landing points officers encounter fishing on the water from permitted vessels. Directed harvest and landing of horseshoe crabs for bait in Maryland is prohibited from January 1 through June 7. Either sex may be harvested, simplifying inspections of catch. Virginia regulations provide for area-specific regulations: a) federal waters, b) waters east of the COLREGS line, and c) waters west of the COLREGS line.

- 1) Landing of crabs in Virginia harvested in federal waters from January 1 through June 7 is prohibited.
- 2) During each calendar year, no more than 40% of Virginia's annual quota may be harvested east of the COLREGS line in ocean waters.
- 3) Crabs harvested east of the COLREGS line and landed in Virginia must be comprised of a minimum male to female ratio of 2:1.
- 4) No trawls are allowed in state waters out to the 3-mile line.

While the horseshoe crab fishery is relatively small and there are no significant barriers to current enforcement efforts, changes contemplated in Draft Addendum VII may be considered in light of enhancing compliance and regulatory simplicity. Currently the four states have differing closed periods of varying complexity. Variable closed seasons per se are enforceable. The LEC's *Guidelines for Resource Managers on the Enforceability of Fishery Management Measures (2009)* rates closed seasons or areas relatively highly. However to the extent that seasonal closures can be more consistent among the four states, this will minimize the potential for illegally harvested crabs from one area or state being landed and sold where an open season occurs. While this may not be a significant problem now, the mixing of illegally harvested crabs with legal landings could increase depending on the price and value of crabs. LEC members caution that good communication within and among jurisdictions is vital for effective enforcement of closed seasons and areas. Quota closures in particular should be anticipated through timely harvest monitoring, and closing dates should be provided well in advance.

Regulations on harvest by sex present unique enforcement challenges. If there are restrictions on harvest of females, officers will need to be able to identify landings by sex with certainty. This is not an insurmountable problem, but requires attention to officer training and provisions to ensure that landings are sorted properly by sex for efficient inspection. Consideration of a Delaware Bay Stock Allowance for Maryland and Virginia presents a special problem. In addition to basic sex identification, officers would be required to ensure that the proper ratio or number of female crabs is harvested. We recognize that is a current requirement in Virginia. However from a strict enforcement perspective, if the allowable harvest of female crabs in Maryland and Virginia is relatively small compared to males, and some provision could be made to compensate with an extra harvest of male crabs, it would be a much simpler approach to simply not have a stock allowance. If a sex ratio is adopted, effective enforcement would depend on continuous sorting and separation of the catch and a requirement to maintain the proper ratio at all times. The *Guidelines for Resource Managers on the Enforceability of Fishery Management Measures (2009)* does not specifically address harvest by sex. However in some respects a stock allowance for females would be similar to bycatch enforcement. In the guidelines, bycatch enforcement via amount landed, amount on board, or percent landed are all rated "Difficult" or "Impractical" tools.

The LEC appreciates the opportunity to comment on proposed regulations for horseshoe crabs and supports the ongoing effort to conserve this valuable species.

Sincerely,

Mark Robson, Coordinator  
Law Enforcement Committee  
Atlantic States Marine Fisheries Commission