

PROCEEDINGS OF THE

ATLANTIC STATES MARINE FISHERIES COMMISSION

HORSESHOE CRAB MANAGEMENT BOARD

Crowne Plaza Hotel Old Town
Alexandria, Virginia
May 4, 2010

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1. **Approval of Agenda, by Consent** (Page 1).
2. **Approval of Proceedings of February 3, 2010** by Consent (Page 1).
3. **Move to Nominate and Elect David Simpson as Vice-Chair of the Horseshoe Crab Management Board** (Page 1). Motion by Jack Travelstead; second by Pat Augustine. Motion carried (Page 1).
4. **Move to approve Draft Addendum VI for public comment** (Page 12). Motion by Bill Adler; second by Pat Augustine. Motion carried (Page 14).
5. **Move to approve North Carolina's quota transfer quota request of 11,655 crabs from Georgia** (Page 14). Motion by Pat Augustine; second by Jack Travelstead. Motion carried (Page 14)
6. **Move to accept Option 2 of the recommendations of the Shorebird Informational Needs Workgroup** (Page 16). **MOTION CHANGED ON PAGE 25: Move to accept the recommendations of the Shorebird Informational Needs Workgroup, including Option 1 of Recommendation 2** (Page 17). Motion by Pat Augustine; second by Jaime Geiger. Motion carried (Page 17).
7. **Motion to accept the FMP Review and State Compliance Report including de minimis status for Maine, New Hampshire, Potomac River Fisheries Commission, South Carolina, Georgia and Florida** (Page 19). Motion by Pat Augustine; second by Bill Adler. Motion carried (Page 19).
8. **Motion to adjourn, by consent.** (Page 28).

ATTENDANCE

Board Members

Terry Stockwell, ME, proxy for G. Lapointe (AA)	Bernie Pankowski, DE, proxy for Sen. Venables (LA)
G. Ritchie White, NH (GA)	Tom O'Connell, MD (AA), Chair
Rep. Dennis Abbott, NH (LA)	Bill Goldsborough, MD (GA)
Dan McKiernan, MA, proxy for P Diodati (AA)	Russell Dize, MD, proxy for Sen. Colburn (LA)
Bill Adler, MA (GA)	Jack Travelstead, VA, proxy for S. Bowman (AA)
Rep. Sarah Peake, MA (LA)	Mike Johnson, NC, proxy for Rep. Wainwright (LA)
Mark Gibson, RI, proxy for B. Ballou (AA)	Willard Cole, NC (GA)
Seth Macinko, RI, proxy for Sen. Sosnowski (LA)	Louis Daniel, NC (AA)
David Simpson, CT (AA)	Robert Boyles, SC (LA)
Lance Stewart, CT (GA)	John Frampton, SC (AA)
James Gilmore, NY (AA)	Malcolm Rhodes, SC (GA)
Pat Augustine, NY (GA)	Spud Woodward, GA (AA)
Brian Culhane, NY, proxy for Sen. Johnson (LA)	John Duren, GA (GA)
Peter Himchak, NJ, proxy for D. Chanda (AA)	Jessica McCawley, FL (AA)
Tom Fote, NJ (GA)	Brian Hooker, NMFS
Gil Ewing, NJ, proxy for Asm. Albano (LA)	Jaime Geiger, USFWS
Craig Shirey, DE, proxy for P. Emory (AA)	
Roy Miller, DE (GA)	

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

Ex-Officio Members

Larry DeLancey, Technical Committee Chair	Allen Burgenson, Advisory Panel Member (Proxy for Chair)
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ASMFC Staff

Bob Beal	Brad Spear
Vince O'Shea	Kate Taylor

Guests

Conor McGowan, USGS	Denise Wolf, Lonza
Greg Breese, USFWS	Rick Robins, Suffolk, VA
Ray Kane, Chatham, MA	Tom McCloy, NJDFW
Ben Martens, CCCHFA	Merry Gamhi, Wildlife Conservation Society
Kristoffer Whitney, Univ. of PA	Benjie Swan, Cape May, NJ

The Horseshoe Crab Management Board of the Atlantic States Marine Fisheries Commission convened in the Presidential Ballroom of the Crowne Plaza Hotel Old Town, Alexandria, Virginia, May 4, 2010, and was called to order at 3:25 o'clock p.m. by Chairman Thomas O'Connell.

CALL TO ORDER

CHAIRMAN THOMAS O'CONNELL: I would like to call the Horseshoe Crab Management Board to order. Good afternoon, everybody. I'm looking forward to chairing my first meeting today, so please bear with me and be patient, if needed.

APPROVAL OF AGENDA

CHAIRMAN THOMAS O'CONNELL: All of you should have a copy of the agenda. The first order of business is approval of the agenda. Is there anybody that wants to suggest any modifications to today's agenda? Seeing none, then the agenda will stand for today.

APPROVAL OF PROCEEDINGS

CHAIRMAN THOMAS O'CONNELL: The second agenda item is to take action on our proceedings from the February 3rd Horseshoe Crab Management Board Meeting. Are there any comments to the draft proceedings? Seeing none, those proceedings will stand approved.

PUBLIC COMMENT

CHAIRMAN THOMAS O'CONNELL: Moving on to public comment, it is normal practice for the commission to allow public comment prior to actions being taken by the board, but prior to that I want to offer any opportunity for the public to make comments on any issue that is not on the agenda.

Is there anybody from the public that would like to make a comment at this time to the board? All right, seeing none we're moving right along.

ELECTION OF VICE-CHAIR

CHAIRMAN THOMAS O'CONNELL: The next order of business is to nominate and elect a vice-chairperson. Jack Travelstead.

MR. JACK TRAVELSTEAD: Mr. Chairman, **I move to nominate Dave Simpson as vice-chair.**

CHAIRMAN O'CONNELL: Jack moves to nominate Dave Simpson as vice-chair; do I have a second? Pat Augustine.

MR. PATRICK AUGUSTINE: Mr. Chairman, move to second that and close nominations and cast one vote for Mr. Simpson.

CHAIRMAN O'CONNELL: Is there any opposition for David? Seeing none, David, congratulations as vice-chair. Moving on, we have a series of technical committee reports. Since our last board meeting, the Horseshoe Crab and Shorebird Technical Committees have met both separately and jointly, and we have the chairpersons here today to provide a report to the board. We're going to begin with Greg Breese from the Shorebird Technical Committee.

SHOREBIRD TECHNICAL COMMITTEE REPORT

MR. GREGORY BREESE: Thank you, Tom. The Shorebird Technical Committee met just prior to the joint Shorebird/Horseshoe Crab Technical Committee meeting. I would encourage the board members to ask questions as I go along rather than wait until the end if it would help clarify things. The focus of the meeting was to review the indices that we've brought before the board to help assess what is happening with the shorebird population, to answer a couple of questions the board had on competition and predation and to look at the latest data from the Virginia stopover and see how that interacts with the Delaware Bay stopover.

The shorebird indices are the ones you see in that list with the addition of the last one marked in yellow, the ratio of marked to unmarked red knots. That one was recommended by the ARM Workgroup as a key to implementing the ARM Framework. It will begin this season implementing and we will start gathering data for the first time this May, so in the future you will be seeing that one as well.

Starting with the shorebird threshold weight index for red knots, this is the best-fitting curve to the data that we have in that time series. If you will recall, that is the ratio of birds that have reached or exceeded 180 grams by the end of the season. The sample size is restricted in time to the end of the season, and, of course, synchronization with when horseshoe crabs are spawning plays a big role in how that ratio pans out.

You can see that the curve that best fits as drawn indicates that there has been some improvement. Looking at the data just as a bar graph, this is how it looks. I would like to point out in 2008 there was a nor'easter, a massive nor'easter. I've heard it referred to as a one-in- forty year storm event that

happened right at Mother's Day, late to early mid-May, and basically shut down horseshoe crab spawning for over a week, so 2008 is probably not directly comparable because of that storm effect.

In 2009 we have a good indication from ground counts that a portion of the red knots made weight and left early, so this also is probably under-representing the proportion of birds that reached weight, but even so the data is, as you can see, relatively varied, and there may be a slight decline but it has been relatively stable.

Moving to the Tierra del Fuego winter count, this is the count of the birds that winter at the tip of South America. It has been stable for six years. I'll just point two features of this graph because I'll come back to it in a later slide, and that is that it appears when you look at this data that there were two periods of decline.

In the early years of the study there was a decline. It is hard to tell over what time period because the study was over quite a few or there were gaps in the surveys that were done. Then at the 2004 to 2005 there was a sudden decline. Those declines were followed by years of stability in the population. Just make a mental note of that and we'll come back to that, but over the last six years it has been stable.

We do have some information on the Florida population. If you recall, we know of three major wintering areas, Tierra del Fuego, the furthest south at the tip of South America; there is a Northern Brazil population that I will get to in the next slide; and there is a Florida/Georgia population. We don't know as much about these northern breeding or wintering populations, but what data we have doesn't lend itself to a clear trend.

It is a difficult area to survey in Florida and there is some question of whether the survey is capturing all the wintering areas or not, so it could be a matter of missing birds, but this is what the data we have says right now, indicating perhaps a decline but hard to tell. In the Northern Brazil area we have far less data. It is an even more difficult area to survey. There was no survey in the last two years, but the data we have indicates that there either was a decline or there has been a shift in habitat use by the birds.

The Delaware Bay peak count is an aerial count. It is designed to capture or identify or estimate the peak number of birds, so it is highly affected by how many waves of birds come in, what time they come in and how long they stay in the bay. This is the total data

set we have and you can see there was a lot variation in the early years, and that variation has been reduced dramatically in the more recent years.

It has been stable for the last seven years as best as we can tell. I should point out that 2008, it wasn't complete because of flight restrictions in the vicinity of Dover Air Base. We don't know what effect that had, but it probably had some effect at reducing the peak count because not all the birds were counted, probably.

In 2009 there was a major change in this survey in terms of methodology and observers. The methodological change was designed to better count red knots and turnstones. What we did was we changed from counting all shorebirds on that survey to counting just turnstones and red knots and having one observer assigned to red knots and one observer assigned to turnstones to really try to improve the accuracy of what we were getting out of that.

However, last season the weather did not cooperate. There were unusually large fog banks that prevented the survey during the peak of the count. If you look at the data, you will see it says it is flat or stable for the last seven years, but if you go to the next slide you will see that based on the ground count, the lighter colored bar on 2009, that it indicates that there were more birds present.

It is dicey adding the ground count to this data set, but that is what the authors of the update to the status assessment of red knots suggested doing because they knew we had missed the peak count due to weather. What they choose was the actual ground count minus 10 percent and it does suggest, if you look at the last two or three years, that there could be some improvement occurring, but, again, it is hard to judge for sure.

When we turn to the baywide egg abundance index, the top figure shows the straight baywide egg abundance index, and you can see that it doesn't really show a clear trend. It shows a fair amount of variation. The other thing you'll notice is that there is a market difference between the counts on Delaware and New Jersey, which I'll get to in a second.

The lower figure shows the same thing minus the Mispillion Harbor egg count, and that was done because of the orders of magnitude more eggs that we find in Mispillion Harbor and the concern that may be muddying the waters, if you will, of the picture of what is happening in the bay other than Mispillion.

That is a look at how it looks without it, and I will go to three specific points related to this. One is that the count for 2009 is probably underestimating because Delaware was unable to complete the survey in Week 7. Also, the Port Mahon effect, which is clear in the lower figure, you can see the first year is way above the other years, and that looks like it was probably the effect of the habitat change in Port Mahon that occurred after that first year of survey. Then I will talk a little bit about the egg enumeration that occurs on the different side of the bay and how that could be affecting how many eggs are seen on the Jersey side versus the Delaware side.

These two show the weekly distribution of eggs. I'm not going to spend a lot of time on it other than to point you to Week 7 on the upper figure, which is the Delaware side, and to just note that the survey did not occur in Week 7 in 2009, so we know that there is a little bit of undercounting for 2009.

This shows the spatial egg distribution so it shows the beaches that are surveyed and how many eggs are found relatively year to year. If you'll look at the upper figure at the far left, you'll see Port Mahon. You can see that the first year Port Mahon was way up there in egg abundance, and every year since then it has been way down.

We know that anecdotally that the habitat change at Port Mahon has been quite severe, and the beach habitat is far, far reduced after that first year, so we suspect that Port Mahon played a much bigger role in egg abundance baywide in that year than it has in subsequent years. Because of the difference in egg abundance apparent in this survey from the Jersey side to the Delaware side, there has been a lot of question about what is going on.

One of the things that was done early on was to look at the spawning survey data. That does not seem to show a difference in spawning side to side, but it does show variation and it does show shifting from one side to the bay to the other, but not in the order of magnitude that we see in the egg survey. An attempt was made to examine how the two sides of the bay, which are done independently for the egg survey, were handling the eggs, particularly the enumeration of the eggs.

On the Jersey side what is happened is they're washing enough sand out of the eggs so that they can individually count eggs. They don't have huge numbers of eggs like they do in Mispillion Harbor and Delaware, so that seemed like a reasonable protocol to use. On the Delaware side, because of the

larger vast numbers of eggs mixed in the sand, a technique of volumetric measuring using a – I think the researcher who is using it calls it a turbinator.

It is a large tube filled with water and by adjusting the flow of water through the tube you can use specific gravity to separate egg, sand, and then you measure eggs volume metrically. What they did was take double samples, send one sample to each side of the bay, have them enumerate it, and the lower figure pretty much tells the story that New Jersey is not detecting eggs as well as Delaware for whatever reason.

It looks to me, when I look at it, that the more eggs in the sample the less efficient New Jersey seems to be at enumerating the eggs, but it was small side-by-side comparison and the technical committee would like more work done in this area to see if we can tease out a little bit more of what is happening. It doesn't account for the full disparity between the Delaware side and the New Jersey side, but it accounts for about 30 percent of that difference that we see in the results of the survey.

The survival estimates we had were interesting. Survival in general has been pretty high over the last few years. Survival comparatively between the northern wintering sites, Florida and Northern Brazil, versus the Tierra del Fuego site at the tip of South America has been about the same, which is interesting. One hypothesis that has been bandied about has been that the birds that have to migrate the further distance will be at a greater stress level if they don't get enough food at Delaware Bay, and so you should see a difference in survival.

That so far doesn't seem to be the case in the work that has been done. The other interesting thing was some correlation between survival of low weight birds in some years with snow cover in the Arctic. No good hypothesis, but the one that has been presented is perhaps the increased snow cover creates weather conditions that are more conducive to insect hatching and there is more food available in the Arctic, but we don't really know.

The comparison between semi-palmated sandpipers and least sandpipers has been presented before. This is a little bit of an update courtesy of Dr. Mizrahi with the New Jersey Audubon Society. Semi-palmated sandpipers rely more heavily on eggs and the beach habitat than do least sandpipers, so they should show an effect more than least sandpipers is the theory behind it.

Here is the data for the semi-palmated sandpipers. Their around the full time that horseshoe crabs are spawning and that red knots are around. You can see that in the three time periods he has broken the time of the study into that in the later years weight gain has been a little bit less each time period as we move into the present and that there has been a divergence in the upper figure between the late period weight gain and the early period weight gain.

These sandpipers don't spend much time on the beach. They don't eat horseshoe crab eggs to any significant extent and they leave by mid-May, so they're a good alternative comparison species. If you go to the next slide, this is the data for the least sandpipers. They were stable in the early time period and the mid time period.

This most recent time period, there has been a drop in weight and there has also been a curious pattern of difference in weight gain in the upper figure. I asked Dr. Mizrahi about it and if he had any hypotheses. He does not; they're looking into it right now, scratching their heads trying to figure out what that might mean or what might be the explanation for that.

He also did some work in their wintering area for semi-palmated sandpipers. It looks like, from the survey work that was done, that there could be an 80 to 85 percent reduction in the wintering population; however the similar caveats to the red knots in Northern Brazil, difficult area to survey. We don't know if the survey is capturing all the potential wintering habitat. This could be representing a shift.

Looking at the peak aerial survey data in Delaware Bay for semi-palmated sandpipers, the problem is that semi-palmated sandpipers use the beach but they also use marshes to a very large extent, so it is hard to draw any conclusions from the peak survey, but it does track a decline in semi-palmated sandpipers as well.

The board has asked a number of times of the committee what effect gulls may be having on shorebirds. We've tried to do as much research on that as we can. We certainly know that gulls out compete shorebirds for space on the beach. We certainly know that gulls are much more adapted to disturbance so they return to the beach after a disturbance faster than shorebirds. They're definitely able to get eggs, especially if they're in short supply, more effectively than shorebirds. We also know from anecdotal observation that occasionally large gulls will take a shorebird.

We don't have any data that indicates that the gull population has changed in the time period that the shorebirds' population has declined. I've superimposed the Tierra del Fuego count data on top of this New Jersey Atlantic Coast breeding gull counts just to see what it would look like, and I imposed those red bars at the bottom of the gull data figures so you could see where the declines in Tierra del Fuego occurred in relationship to the gull population data we have.

It doesn't to me show any correlation. About all we can say as a committee so far is that we recognize that gulls can out compete and they're having an effect; and as egg supply becomes less numerous, they're probably having a larger effect but it is one of several factors that could be affecting it, and it is not clear that gulls, per se, are a smoking gun in terms of the decline of red knots or other shorebirds. Yes.

MR. AUGUSTINE: When you look at the trend line, it is consistent. Is it approximately the same number of shorebirds every year? There is a balance here. You haven't shown one going up, but you see the same trend line for both; so is it possible that as the young of the year come into the flock, if you will, that although the herring gull population has not gone up, there could be a direct relationship, availability, demand, I'm not sure. I'm trying to draw some conclusion. You indicate there is no conclusion, but there is a conclusion because neither one seems to be increasing, but there seems to be a relative line between both of them.

MR. BREESE: I guess I'm not quite sure what you're seeing. When I look that, for instance, the large red bar where the decline in the early years, I see the gull population relatively stable with a little dip in it and then an increase. When the red knots were relatively stable, I see the gull population declining a little bit.

When I see the next dip in the shorebird population, which happened very quickly, I see the gull population was going down. I understand what you're saying but it doesn't look like a good correlation. In addition, I would just say that we don't have good data on whether gulls suddenly moved into the Delaware Bay. It does not appear that way anecdotally.

We are starting to take counts of gulls when we do the shorebird work, so in a few years we might have a better handle on that, but there is nothing really clear and easy to put your finger on. We certainly recognize that as the egg supply becomes shorter and

less available, the gulls are going to do better at getting the eggs than the shorebird.

MR. AUGUSTINE: Thank you for that explanation.

MR. BREESE: There was also the question that came up in the winter of peregrine falcons based primarily, if I recall, on this publication that was sent out by the Center for Conservation Biology out of William and Mary. What they did was they did aerial surveys of red knot use of the beach in relationship to nesting towers for peregrine falcons.

We know peregrine falcons take shorebirds including red knots. When we've done survey work on Delaware Bay and looked in peregrine falcon nesting boxes, you can find lots of red knot wings and legs, so we know that they're certainly a predator. Whenever we see a peregrine come in while we're watching shorebirds, they do a very distinctive flight pattern, very chaotic. They stay away for long periods of time. We can even identify that a peregrine was probably in the area just by the behavior of the birds although we may not see the peregrine and we can't say for sure.

We know that they're having that effect, but we haven't seen this type of an effect spatially where as you get closer to a peregrine nesting box you're seeing fewer and fewer red knots. That could be related to the conditions that the red knots have in the Virginia stopover where they're feeding on a more ephemeral food source, they've got many more areas spread out where they can move, and they can choose to avoid certain areas and use other areas because they're getting enough food for what that population needs in Virginia.

In Delaware Bay the food source is very concentrated. It is only in small areas and they may have to risk being eaten by a peregrine falcon rather than have any other food available to them. At any rate, we don't see an effect of peregrines like this; however, there are peregrine nesting boxes on the bay.

There is one in fact very close to Mispillion, just a little bit north near Port Mahon, if you're familiar with the area. The state of Delaware has gone ahead and radio-tagged the two peregrines that use that nesting box and we will be monitoring their movements so we'll have a little bit more information.

There has been some discussion about whether that box could be moved or not, but this season we will

try to collect more information and have a better idea. The bottom line for peregrine falcons on Delaware Bay seems to be, like the gull story, yes, they're having an effect. As egg supply becomes lower and birds have to struggle more to get it, it could be a larger effect, but it is one of several factors and it certainly doesn't seem to be a smoking gun as far as the decline of red knots and shorebirds at Delaware Bay.

We did look at the other information available for the Virginia stopover. This is a map that gives you an idea of where they are in relationship to each other so you can have a sense for it. There seems to be a relatively consistent pattern of use by red knots in the Virginia stopover over time. In fact, looking at historical records we can see some comments about that, so it seems to have supported, say, seven to ten thousand red knots for a long period of time although it came to our attention relatively recently.

They're feeding not on horseshoe crab eggs but on clams, mole crabs, the more typical food that they would have, which tends to be more ephemeral because they're looking for very certain size classes so they're having to move around a great deal. It is a hard area to survey, but there has been a fair amount of work.

With the wonderful resource of re-sighting that we have made available by color marking individually the birds with flags, we're able to see some exchange occurring both within year, which is very little, and between years, which is either very little or quite a bit, depending upon which data set you look at and which researcher.

That has raised a number of questions in our minds and we're trying to grapple with that and find out more information about how much exchange really is occurring. Just to summarize, the weight-to-ratio index suggests there is some improved conditions for the birds. Winter count doesn't show any real trend over the last six years; though a bay count shows no trend over the last seven years; although we had some confounding factors particularly last season, so maybe that story is not quite right and maybe there was some improvement.

Egg abundance doesn't really show any trend and the curious issue of enumeration and the difference between the sides of the bay is still being looked at. Survival between the northern wintering populations and the southern wintering populations didn't seem to show any difference. Survival was high for both groups.

Semi-palmated sandpipers still seem to be showing an effect of perhaps not enough eggs for as much weight gain as they had one in past years versus lease sandpipers which don't seem to be showing that effect although again confounded by the last year difference in the weight monitoring for lease sandpipers.

Gulls don't appear to be a strong factor or a big factor in decline nor do peregrine falcons. The Virginia stopover seems to be stable, but it also doesn't seem to be an area that could support the number of birds we see at Delaware Bay either currently or historically. I guess I would conclude with the bird population seems to be stable; and that's a good thing, they're not declining.

The egg supply doesn't seem to be showing a measurable increase but it is a difficult thing to measure, so I'm not sure how much confidence to place in that. The eggs that we're talking about when we're counting, doing an egg abundance survey, are surface eggs. Surface eggs are on the surface because of wave action and digging up by succeeding waves of female crabs.

Once they get up to the surface, they can wash away, they can dry out, they can be eaten by fish, they be eaten other birds as well as shorebirds. It is a really tough, tough thing to monitor, so I'm not sure that we would see that, quite frequently. A lot has been done to try to improve the egg supply for birds. That's basically where we are. It looks like we're doing a lot of stuff to do it, and we just unfortunately have to wait. This is one of those things that you don't turn on the dime. Thank you.

CHAIRMAN O'CONNELL: Thanks, Greg, a lot of good information and a lot good work being done. Before we proceed with Greg's report of the Joint Horseshoe Crab and Shorebird Technical Committee meeting, are there any questions for Greg? Peter Himchak.

MR. PETER HIMCHAK: Mr. Chairman, I just had one comment on the disparity in the egg counts. I hope this gets resolved shortly because in our legislation that established a moratorium on the horseshoe crab harvest things, one of the metrics to be measured that would allow for a renew harvest is a certain egg density available to shorebirds. I would hope that this disparity in results or sampling methods or whatever gets resolved in the near future. Thank you.

MR. ROY MILLER: I couldn't find your visuals in the handouts, Greg. Will you make those slides available to the commission so they can post them on their website? Thank you.

CHAIRMAN O'CONNELL: Any other questions for Greg? All right, Greg, if you would proceed with the joint committee report.

JOINT HORSESHOE CRAB/SHOREBIRD TECHNICAL COMMITTEE REPORT

MR. BREESE: Again, if you see something that I should clarify, speak up and let me know while we're going along. I think in general it saves time. This joint meeting of the Horseshoe Crab and Shorebird Technical Committee occurred immediately after the Shorebird Technical Committee met. It included a presentation by Conor, who is here today, on directly trying to give the information on the ARM Framework to stakeholders.

A number of stakeholders were invited that we might not have normally tried to reach out to in order for them to hear what the ARM Framework was, how it had been developed and for them to ask questions. We had a vigorous and wide-ranging discussion throughout the joint committee meeting both with the stakeholders in the beginning and with the committee members afterward.

They covered basically three major areas in my mind. One was the overall process of how feedback comes in and how decisions are made. The other was some technical aspects of the ARM Framework and how those decisions were made and whether there should be some adjustments. Then we also got a great presentation from Dr. Hata on the trawl survey.

With the overall process questions, they sort of came both from the stakeholders and the technical committee members. The stakeholders had very strong feelings that they wanted to have input, but they weren't sure whether they were included appropriately all along the way and that they wanted to have more input than simple statements at public hearings but be involved in some of the decision-making. That point was made a number of times.

On the technical committee members' side, there was clearly some confusion over the process that we were going through and when they would have input and how that would synchronize with what the board's deliberations were. There was a bit of frustration among members who had somehow come to the

expectation that they would have a chance to review the peer review of the ARM Framework prior to the board seeing it and have a chance to perhaps have comment and make some adjustments to it via the ARM Workgroup.

The discussion was good and noted and for future reference there may be some things that could be adjusted with that. As far as the discussion points related to the ARM Framework, there were particularly three points that were discussed at length, debated at length, however you want to call it.

One was what threshold level for the red knot population you should have before you start allowing harvest, essentially. The second was to maybe make that not a knife-edge as you might call it so that you reach that threshold and immediately harvest can occur, but instead make it a function where you reach a lower threshold and then there is some value to harvest until you reach a secondary threshold and then you have full harvest.

The third was to look at the horseshoe crab threshold and consider whether it is too high and whether it could be sloped as well. The bottom line seemed to be that it was driven on the part of some members by an extremely high valuation of shorebirds and an extremely low risk tolerance, but when all was said and done there didn't seem to be any clear way to move forward on those. They just seemed to be tweaking the model that will eventually teach us by using it, so it didn't make sense to make any changes. There were two key monitoring components to the ARM Framework in implementing it.

One is the trawl survey, and I'll be talking about that a little bit later, but that is a key piece; and without it, we probably can't implement the ARM Framework. The second is having the marked/unmarked ratio data from the red knot population, and that is another key piece. That was discussed quite a bit. We do think that can be incorporated into the normal shorebird monitoring work that is being done so it doesn't require a lot. The trawl survey, on the other hand, requires some funding, and funding runs out in 2010, so 2011 and beyond is in question.

When all was said and done after discussing it, there was consensus to move forward with the ARM Framework, implementing it, using it as a tool to help us learn and reduce uncertainty. There were some concerns about it due to, as I said, that feeling of risk tolerance and the value of birds relative to other things, but that concern did not rise to the level of

minority opinion. We still ended up moving forward with the consensus.

There was a list of tasks that the ARM Workgroup is going to be encouraged to undertake relative to adding some clarity to some of the decisions that have been made along the way and testing and improving or learning a little bit about the modeling. It is nothing that stops implementing it but certainly good work to do as we move along through that.

There was a great deal of discussion in how implementing the ARM Framework would look to the management board in terms of timing and your decision-making. After quite a bit of discussion, we really came to the conclusion that it is not much different than what you're doing now, which is having to look in some cases at different data years for certain data sets and then coming to a conclusion.

This slide tries to lay it out for you in a logical way where you have a decision to make in Year "T", say this year, and for the trawl survey you're going to be stuck with last year's data, so that would be T minus one. In 2009 the trawl survey was run in the fall; you have the report already. Then in this year or Year "T" you would have to rely on the shorebird survey work to get the marked/unmarked ratio. That should be completed in terms of data collection by June.

By June 30th we should be able to get that to the ARM Workgroup, and then they should be able to use that to inform decision-making by the end of July, and then it would be in front of the management board by August. The figure at the bottom shows the timeline, which would allow you to come up with regulations and the states to hopefully have those regulations in place for Year T plus one.

I would point out that all of this sounds like everything is well in hand, but there is one piece that still needs to be done that hasn't been done, and that is to figure out how to translate the management recommendations from the ARM Framework into state-by-state quotas because it works on a regional basis and will give you the management option that is best based on a regional basis and not on a state-by-state quota basis.

I know Conor has presented this to you in the past, but we're just finishing the setup phase for creating the models necessary to do this, to learn, to find the best management decision. Then you go into the second loop circled by that yellow square or rectangle that is day-to-day or year-to-year or every other year management that you do where you let the

models run; you look at what the monitoring programs tell you; you see if the predictions of the models are predicting what the monitoring shows you.

Then you make decisions each year or every year on what your management options should be. Then periodically, say on the order of time that you do stock assessment reports already, you would go back and step back and look at it and see if you need to rebuild models, change models or ask different questions.

For the next few years you would be doing those two middle ones that are highlighted in yellow. Based on the discussion we had at the joint committee, the joint committee recommended that we sort of examine all facets of it this first year because of some uncertainty and concerns, so we would sort of go into that larger loop stock assessment type look at it this first year and then slip into the waiting a few years to learn from the models.

Then, as I said, Dr. Hata presented us with the trawl survey report. I don't think you guys have had that presented to you although you have probably seen the report in the handout materials. Basically, it is indicating that there seemed to be a lot of juveniles coming in line, that we're not anymore increases with the matures, that the New York Apex doesn't show a trend but it is a little concerning from some of the reports we're hearing from harvest and populations.

The survey seems to adequately sample the coastal population, but it doesn't do anything in the Delaware Bay, so this year they're going to have an extension of the survey into Delaware Bay and see what they find. One of the interesting suggestions from some of the work by Dr. Smith was that perhaps there is a population or a portion of the population that resides in Delaware Bay year round, and this will help us answer that question. Funding is adequate through this year but not beyond, and the cost is roughly \$200,000.

One thing to take note of for the trawl survey this year is it happened quite a bit later and the water temperature was cooler than it has been in past years. This figure at the top shows you water temperature; at the bottom it shows you the dates where the survey occurred. You can see that this past year it was considerably later than it has been in other years, so that potentially impacted the numbers that we see in the survey.

These are the results for the Delaware Bay area. You can see the juvenile increase, stable; adults with a little bit of a dip from last year. Compressing all the age classes together, this is what the data looks like for Delaware, and on your right is New York; again, not much of a trend in the New York area but an overall trend up in Delaware.

This was the really interesting part and I will direct your attention to the figure on the left. This is showing you the size classes that were caught in the trawl survey. If you look at bottom figure on the left side, for 2009 you will see a huge spike of small age classes, which is very, very encouraging.

In summary, the joint committee felt that the ARM Framework was a good one to move forward with. There was consensus on that. There was consensus that the timeline would work in terms of implementing it. There was consensus on when the timing would be for different types of input and review of the work.

The trawl surveys showed an increase in juveniles and smaller crabs, but not showing yet a trend that you can put your finger on for adults or primiparous crabs. If there are any questions, I would be happy to entertain them.

CHAIRMAN O'CONNELL: Are there any questions for Greg? All right, thanks a lot, Greg. Moving on, we have the Horseshoe Crab Technical Committee Report by Larry DeLancey.

HORSESHOE CRAB TECHNICAL COMMITTEE REPORT

MR. LARRY DeLANCEY: This meeting continued the marathon session that Greg had just talked about. We merely started into the Horseshoe Crab Technical Committee meeting. A primary discussion was responding to and talking about peer-reviewed comments on the 2009 stock assessment, the trend analysis and kind of where to go forward.

The peer reviewers had put out a lot of good ideas that the stock assessment committee, which is now chaired by John Sweka replacing Dave Smith, things certainly to work on now and into the future. Some things will be looked at for the next stock assessment, so we've got things that can be worked on for the next five years.

One thing they were very encouraged with is – and if you've read the report of the peer review – the catch survey model developed by Rich Wong of Delaware.

It is very promising. There may be some fishery-dependent information available to help that. Maryland collects information on the biomedical catch, which would be useful. Everybody is encouraged with that particular model.

Most people hope that there are other models besides the surplus production model and other stage-based type models that can be developed hopefully. It is hard to develop biological reference points for horseshoe crabs. You can't really age them, et cetera, but that part is difficult, as most of you know.

In terms of monitoring and research recommendations from the peer review, they certainly will adhere to a lot of what those folks had said. I can't emphasize enough the continued funding of the Virginia Tech Survey. Almost none of this work is going to be possible unless there is some stable funding source for that.

If it can't get stable funding, one thing that Dave Smith and Conor had mentioned in the ARM Report was part of their monitoring, they would like to see a catchability study of the newly maturing horseshoe crabs versus the more mature ones, and you could compare the trawl efforts with a hydraulic dredge, for instance, a comparative study.

Again, that would take some money so hopefully that is something that can be done in the near future. Not everybody was happy with all the stock boundaries. The stock assessment painted very broad brush strokes of areas like New England and New York, but there is a desire to look closer at the fishery-independent surveys down to geographic differences.

There are possibly habitat differences. There is some habitat mapping going on in the state of Connecticut and also in Delaware, which might be useful looking at different stages. The peer review also said it would be good to possibly do some weighting of some of the indices, which certainly can be done.

Stu Michels has started an attempt to try to identify what percentage of the Delaware Bay horseshoe crabs are caught off Virginia and Maryland in the oceanside bays. If he comes up with a number and the states are basically going to respond with what they think the number is, that is one way of getting at – and also looking more closely at the U.S. Fish and Wildlife Service tagging data base of which there is a large amount of that and it is a very useful thing. The University of Delaware, alternative bait apparently is at a halt.

The DuPont Company has the matrix, but the attractant has not been synthesized so I think it has kind of – at least looking for an attractant to use as an alternative bait is sort of at a standstill right now. We also talked about in Connecticut where there was a public outcry last year over a large-scale program for tagging horseshoe crabs.

One of the universities up there and maybe several – it is mostly an outreach educational thing. They do tag a lot of crabs. There was some concern that crabs that may molt again with a tag may die. There is not a lot of information on that. Dave Smith looked in Delaware Bay and he thought that most mature animals have undergone a terminal molt so it is not probably a big problem at least in Delaware. It needs more work.

Penny Howell, who is now our vice-chair I'm happy to say, mentioned that in Connecticut they are going to try to address that with a tagging study. They're going to hold the animals for about a month and look at the potential mortality. In South Carolina we are also looking at tagging mortality on bled horseshoe crabs, and we're also doing a long-term hopefully bled versus non-bled mortality study on tagged crabs.

Tagging to us is still very important and years ago we developed a protocol for responsible tagging with our tagging subcommittee. We kind of agree that the horseshoe crab fisheries in New York and Massachusetts are in some sort of trouble there probably because of less harvest in Delaware Bay. I know those states have undertaken some management efforts there to cut down on the catch. The technical committee encourages the board to ask questions of us or task the technical committee to monitor these populations or anything else you may have in mind at any time. That's all I have.

CHAIRMAN O'CONNELL: Thanks, Larry; any questions for Larry? Brad has agreed to send both of Greg's presentations out to the board members so you have a copy of that. Moving forward, we will have the advisory panel report. We have Allen Burgenson sitting in for Jim Cooper today.

ADVISORY PANEL REPORT

MR. ALLEN BURGENSEN: Mr. Chairman, thanks for the opportunity. My name is Allen Burgenson, and like Tom said I'm sitting in for Jim Cooper today. For the biomedical industry the AP reviewed the biomedical landings and mortality estimate table prepared by the plan review team for its annual FMP Review.

The group felt that the 15 percent mortality estimate applied to bled crabs is too high. While the AP acknowledges regional differences, members also pointed out that handling techniques for return of specimens have significantly improved over the years. A biomedical company from Maryland reported a study where about 3 percent mortality occurred after the bleeding process.

Therefore, the AP recommends that the PRT reports mortality estimates using a range of percentages from approximately 3 to 15 percent to reflect the range of studies on this topic. The AP also recommends that more studies be conducted to refine estimates of mortality on bled crabs.

Massachusetts DMF recently conducted another study to help inform this issue. With crabs provided by the biomedical industry and its harvesters, Massachusetts observed mortality of up to 30 percent. The results of this study have not published. The AP urges caution when interpreting these preliminary results because of the lack of uniformity for controlled experiments.

One AP member noted stressors not accounted for during the initial study likely contributed to higher mortality rates. For example, horseshoe crabs often need a steady supply of food and fresh seawater to clean their and clear waste. Starting this season, South Carolina initiated a study using Sea Grant funding to investigate the effect of bleeding on horseshoe crab survival.

The advisory panel recommends that states considering starting studies of bleeding mortality use the panel as a resource to review proposals and comment on study design. In the addition, the advisory panel would like to review all relevant published studies before they are presented to this board.

Next up is the Virginia Tech Benthic Trawl Survey. The advisory panel reviewed the Virginia Tech survey and made a few comments. It was noted that the New York apex core of the survey should be moved more east almost to the fork of Long Island. This is relevant because the main spawning area is off Great South Bay.

The advisory panel highlights that the Delaware Bay portion of the survey this past year was sampled later in the season than normal due to adverse weather conditions. The later sampling period could explain why the numbers of mature and newly mature adults were down in 2009. Concurrently, the estimates of

abundance numbers produced from the survey results include an assumption of 100 percent catchability of crabs.

Because this leads to an underestimation of abundance estimates, the AP recommends in the future that a gear efficiency study be conducted as a part of the survey. Funding for the Virginia Tech survey is secure only through 2010, a previously mentioned. Virginia Tech is seeking to obtain funds for beyond this year.

The advisory panel members agreed that continuation of the survey is critical to the sound management of the horseshoe crab and shorebirds. The advisory panel recommends the board members and interested states provide any help they can to ensure continued funding.

For 2009 Horseshoe Crab Stock Assessment and Peer Review, the assessment concluded that abundance in the regions of New York and New England are decreasing. The panel urges caution when interpreting the data and trends. The surveys in these regions catch relatively few crabs. This is because the surveys do not target areas of known horseshoe crab concentrations and do not use gear intended to catch horseshoe crabs.

The assessment models indicate that the Delaware Bay population is recovering. Despite the development of the ARM Framework, panel members feel it is still important for managers to use biological reference points for horseshoe crabs as a single species. BRPs provide another frame of reference. For the Adaptive Resource Management Framework, Conor McGowan, the lead ARM modeler, presented an overview of the structured decision-making framework and ARM models to the advisory panel.

Conor satisfactorily addressed the AP's concerns and questions. The advisory panel recognizes the ARM Framework limitations but recommends that the board move forward with its implementation. The AP forwards the following suggestions for the board's consideration. The ARM Framework should be implemented with the option to set multiyear specifications that can be adjusted if warranted by significant changes in model inputs.

The harvest alternatives currently in the framework should include at least another option that allows for a large male and small female harvest. If the board uses the ARM Framework for management, allocation of crabs among the Delaware Bay region

states must be based on the best available analysis of tagging data.

For horseshoe crabs and shellfish interaction; horseshoe crabs are known to be heavy predators of shellfish such as surf clams, quahogs and mussels. Panel members suggested that scientists estimate how much effect horseshoe crab abundance has on populations of shellfish. The advisory panel suspects as horseshoe crab populations continue to rebuild, their impact on commercially important shellfish stock could be significant.

It is possible to develop an ARM Framework that addresses this multispecies issue. The first step is to develop a unified objective statement that incorporates all views. Finally, for the North Carolina Quota Transfer Request, which will be coming up later, the advisory panel recommends that the board grant North Carolina its request for transferring quota from Georgia. Any questions?

CHAIRMAN O'CONNELL: Thank you, Allen; any questions? Thank you all for giving such thorough reports. There is a lot of hard that is going on to prepare for these meetings. Just looking back at where we were with horseshoe crabs in the mid-1990's, it is really incredible to see how much work has been accomplished since then, so thanks a lot.

DRAFT ADDENDUM VI OVERVIEW

The next agenda item is related to the Draft Addendum VI . The board needs to decide whether or not to go out for public comment. At the last board meeting we tasked the staff to develop a draft addendum to include management options from status quo to management under the Adaptive Research Management Model. Brad Spear is going to give an overview of the Draft Addendum VI.

MR. BRADDOCK SPEAR: Today the board will be reviewing the draft and approving the document for public comment. If that is the case, public comment and hearings will take place in June and July. The board will come back in August to select the option or options and approve the final document.

Option Number 1 in the document is no action; so if the board were to take no action, the provisions for horseshoe crab management in Delaware Bay would revert back to Addendum III. In New Jersey and Delaware that is a closed season from May 1st to June 7th and a 150,000 crab annual quota per state, and that is male or female.

In Maryland they would have a closed season from May 1st to June 7th with a 170,653 crab quota. In Virginia their provisions would revert back to Addendum I in which there is no closed season for the state fishery and a little over 150,000 crab quota. Option 2 is essentially status quo, which is in place for 2010 with Addendum V. Option 2 would extend or continue those provisions. In New Jersey and Delaware harvest and landing is prohibited from January 1st to June 7th. All female harvest and landing is prohibited for the rest of the year. The provisions allow for a quota of 100,000 male crabs per state.

In Maryland this option would prohibit harvest from January 1st to June 7th and allow a quota of 170,000 crabs, roughly. For Virginia it would continue its closure in federal waters from January 1st to June 7th. It would maintain the requirement that east of the COLREGS Line a maximum of 40 percent of the state harvest could occur and that harvest must maintain a minimum male-to-female ratio of two to one. It maintains their quota at just above 150,000 crabs.

Suboptions of Option Number 2 are to continue this suite of regulation provisions for a period of one year, three years, five years or indefinitely until another addendum replaces the provisions. Option Number 3 included at the board's request is the ARM Framework option, and it is broken down in the document and in this presentation into two different cycles.

Essentially there is an annual cycle where, for example, the board would be making a decision this August based on technical committee input or ARM Workgroup input from the ARM models, and the board would make a harvest package decision for the Delaware Bay. In the spring of 2011 the technical committees would compile the most recent horseshoe crab and shorebird data and forward that to the ARM Workgroup to conduct the ARM modeling and optimization.

They would come back to the board in August 2011 to present that information to the board, at which point the board would have the choice to decide on another harvest package or maintain that current package for the following season.

The other part of the ARM Framework is this sort of longer-term cycle which focuses more on the value-based inputs into the ARM Framework. This is where the stakeholders play more of a role. Every three to four years the stakeholders would revisit the

value-based components which are the objectives of the ARM Framework; the thresholds that go into the modeling in addition to the management alternatives that are included.

The technical committees would take that input from the stakeholders and also compile the latest technical information and make recommendations for how to adjust the ARM Framework to the board, and the board would then select those options or select those components and then task the technical committees with working with the ARM Workgroup to then rerun the models with these new parameters.

Then essentially the ARM Workgroup would come back to the management board; and if you recall the annual cycle in the slide before, to make its decision in August. The last component of the draft document is compliance and states – as it is laid now, states would be required to submit implementation programs by September 1st and states would be required to implement the provisions of Addendum VI November 1st, after the current Addendum V expires on October 31st.

DRAFT ADDENDUM VI DISCUSSION

MR. TRAVELSTEAD: Questions in a couple of areas, and I'm not finding certain things in here or they're actually not there. I'm not quite sure I understand the annual cycle versus the long-term cycle under Option 3, but what I'm looking for is whether or not there are provisions under that option for what I would call the multiyear specification setting where you wouldn't have to come back to the board every year and make decisions on what the provisions are going to be for the next year. You could set them for two or three years out. Is that in here; and if not, could it be in here?

MR. SPEAR: That is not in there currently. That idea first came up formally in the ASMFC process at the advisory panel meeting about a week and a half ago. It was included in the advisory panel report. Conor McGowan, the lead ARM modeler, was at that meeting. There was a dialogue about including that option; and from a technical modeling point of view it is possible and could be included in the document.

MR. TRAVELSTEAD: I would like to see that in there as maybe a suboption or something under the Option 3. The other thing that I don't see in here or maybe don't understand is under Option 3, which is the ARM Framework, that framework deals with Delaware Bay crabs, so I guess I don't understand. If

we went with that option ultimately, how does the addendum contemplate quotas that aren't Delaware Bay stock? What would we operate under for that?

MR. SPEAR: The states that are not affected by that option would maintain their quotas that are set under Addendum I.

MR. TRAVELSTEAD: Okay, is that clearly stated in this document; I didn't find that?

MR. SPEAR: Then probably not, but we'll make sure it is in there.

CHAIRMAN O'CONNELL: Just on the points Jack made, is there any objection with adding another option for a multiyear specification under the ARM Model? All right, seeing none, we will have that added for consideration for approval. Peter.

MR. HIMCHAK: Jack brings up a very interesting point; you know, it was reference period landings minus 25 percent, so I guess the Delaware Bay component going to Virginia would come off your reference period landings minus 25 percent minus the Delaware component. It is a good question.

I had another question that somebody asked me to bring up at the meeting, and again it deals with Option Number 3. If the board selects to go forward with the ARM Model – and I'm looking at the top of Page 7, Brad, and I'm bringing this up and you might get this at public hearings. Again, this is after the board decides to go ahead with the ARM Model – and then it says the ARM Working Group would come up with harvest scenarios for the board to consider, and then it says the board would decide whether to follow this harvest package or select a different bait harvest management alternative at its meeting.

It is kind of like is this suggesting an Option 4 to account for some kind unprecedented piece information or wrinkle in the process? I don't know what other – once you select the ARM Model, why would you dismiss all of its output and then go with something else?

CHAIRMAN O'CONNELL: Conor, while Brad is thinking about that, you may be able to help us out with that one.

DR. CONOR MCGOWAN: No.

CHAIRMAN O'CONNELL: I think it is a good point, Peter; Brad is going to give it a shot.

MR. SPEAR: Pete, it is my understanding that the way the ARM process and framework work is that in order to learn this sort of double-loop learning process – in order to monitor your decisions in future years, the board should select one of the alternatives. It doesn't necessarily have to be the optimal decision that is produced by the model because the model can still inform the board even if another option, a less optimal option is chosen.

CHAIRMAN O'CONNELL: So it sounds to me that at the minimum we need to add some clarifying language in that paragraph to explain that better. Any other questions for Brad? All right, seeing none, this is an action item for the board. How would the board like to proceed today? Bill.

MR. WILLIAM A. ADLER: Would it be appropriate that I make a motion that we move this addendum to public hearing; is that what you're looking for?

CHAIRMAN O'CONNELL: That is what I'm looking for.

MR. ADLER: **I so move.**

CHAIRMAN O'CONNELL: So the motion is move to approve Draft Addendum VI for public comment; do we have a second? Pat Augustine seconds. Any discussion on the motion? Jack Travelstead.

MR. TRAVELSTEAD: Just that it is understood, I assume, in the motion that the changes staff would have to make would be included in the document in the addition of the suboption.

CHAIRMAN O'CONNELL: Would you like that added to the motion or is it okay just to –

MR. TRAVELSTEAD: As long as it is understood; I'm fine with it.

CHAIRMAN O'CONNELL: Okay, I think the board understands that we will incorporate the changes as previously discussed. Any other questions or discussion on the motion? All right, why don't we provide a few minutes for public comment. Anybody in the public want to provide some comments to the board? Rick Robins.

MR. RICK ROBINS: Mr. Chairman, it has been a pleasure to serve as a member of your AP and have the opportunity to work on the ARM Model. I would just like to commend especially Conor McGowan and

the modeling team for all the work that they have done. I think they've done a tremendous job with a very complex issue.

Conor provided the AP with I think a very encouraging report on the model two weeks ago. I was very pleased to see the AP endorse the application and implementation of the model. I think the commission deserves a lot of credit for having made a lot of hard decisions over the years and recovered the horseshoe crab population very substantially, and yet this I think promises to build on that success.

This will be a process by which we can learn through the Adaptive Resource Modeling Process. There are several underlying hypotheses here, and the weighting of those can be changed as we improve our understanding of how these dynamics interact and reduce key uncertainty. I think it is a significant potential advancement.

I think it puts the commission really on the leading edge of ecosystem management in its application. Just a question for clarification, I appreciate the fact that multiyear specifications are going to be considered. I think that has the potential to provide some regulatory stability, which will allow the industry to operate as conservatively as possible which I think has significant benefits.

I think Brad had clarified that the non-ARM component of the catch that a state is responsible for; if it has an ARM allocation is that being deducted or would that be the balance of Addendum IV quota or would that be the balance of the Addendum I quota less the ARM allocation? I think that's something that we might benefit from some clarification on, because I was under the impression that we would be operating under Addendum IV quota levels less whatever the state received for an ARM allocations.

In other words, if Maryland receives an ARM allocation of 100,000 crabs in the final decision, then their quota going forward would be whatever they had under Addendum IV less that ARM allocation. I would just ask that question. I think that might benefit from some clarification.

MR. SPEAR: Yes, I think the way it would play out through the ARM Model, when the technical committee recommends a percentage for a proportion of Maryland and Virginia's landings are of crabs of Delaware Bay origin, that percentage or that proportion would be then applied to those states' quotas from Addendum I or Addendum IV. I guess

essentially they are both the same quotas for Maryland and Virginia, so it's either one of those addenda, and I think maybe that's a point for the board to clarify.

MR. ROBINS: Thanks for that clarification and, again, thanks for the opportunity to comment.

CHAIRMAN O'CONNELL: Thanks, Rick. Any other comments from the public? All right, I'll bring it back to the board then. Conor.

DR. MCGOWAN: I'm not sure if I'm public or when exactly could I interject here. I had talked with Brad earlier about the multiyear specification issue. I wanted the opportunity to make the board aware of some of the more technical issues associated with that. I think, as I said earlier at the AP meeting, that it is possible. We could set the decision cycle up for any number of years, whatever the board desires.

That is just a technical of how you're going to do the C-plus-plus code to make that work. The issues that I would currently be concerned about is that it seems to me that the plan is to come together in August, enact the addendum and set a harvest regulation for 2011 in August. We, the ARM Working Group, would need to know in advance of that August meeting how many years we were making a recommendation for.

In order to redo the computer code and in order to redo the optimization and come out with a new set of harvest recommendations, we need to know some of the answers to these issues in advance of the August meeting in order to be able to present with you with a set of recommendations. That makes perhaps this first year an awkward year, and maybe there could be some consideration for this first decision point, we do a single-year decision and thereafter it becomes a multiyear specification.

I'm not sure how to proceed with that, but I wanted to make the board aware that if we are going to change the structure of the time structure in the model, it's going to require us to know in advance of August what that time structure is in order to make recommendations.

MR. BRIAN HOOKER: I was just going to say that I thought the soonest you would be making specifications would be 2012, so you would have from the August 2010 meeting to collect data all the way through 2011, and then the earliest you would set specifications was 2012 according to the slide that Brad put up, I believe.

MR. SPEAR: No, the way the option is set up right now the board would make a decision in August 2010 for harvest in 2011.

CHAIRMAN O'CONNELL: I guess one of the combination approaches could be is that we go forward with Option 2, continue with Addendum V for 2011, and then work towards implementing ARM for the 2012 season. That would provide a little bit more time to work out some of these details. Jack.

MR. TRAVELSTEAD: I certainly like that suggestion, Mr. Chairman, but I guess that is down the road to be made. My question was how much work is it to change the computer code and do the multiple runs for one, two, three years? My inclination would be if it is not a lot of work, just anticipate that the board might request that and go ahead and do it. Again, I don't have a lot of heartburn with just this first year of doing it one year and then thinking multiple year down the road. That doesn't bother me that much.

DR. MCGOWAN: I guess I can respond to that at least a little bit that we could probably structure it to have multiple time scales in the decision cycle. We could set up a single-year decision cycle and a three-year decision cycle and be ready to go. I guess the real problem is the coding is not the issue. It takes on the order of a week to get the optimization complete, and so having – I think we are time-limited in terms of getting all that done before August, I guess I would say. It would be best to know in advance.

CHAIRMAN O'CONNELL: Thanks, Conor. Well, we have a motion on the table. Let's call the question. I'll give you guys 30 seconds to caucus.

(Whereupon, a caucus was held.)

CHAIRMAN O'CONNELL: All right, we're going to call the question. All those in support of the motion please raise your hand; all those opposed; any null votes; abstentions. **The motion carries sixteen to zero to zero to zero.** The next agenda item is to consider North Carolina's Proposal to transfer quota. Brad Spear is going to provide an overview of that.

NORTH CAROLINA PROPOSAL TO TRANSFER QUOTA

MR. SPEAR: Included on the Briefing CD was a letter from North Carolina to ASMFC requesting a quota transfer from Georgia. Quota transfers are allowed under Addendum II to the FMP. It lays out a process where the technical committee and advisory

panel reviews the proposal and makes recommendations to the board. You have heard today from both the technical committee and the advisory panel that they are in support of North Carolina's quota transfer request from Georgia in the amount of 11,655 crabs.

CHAIRMAN O'CONNELL: Thank you, Brad. Pat Augustine.

MR. AUGUSTINE: Mr. Chairman, I would like to make a motion with respect to that; move to approve North Carolina's quota transfer quota request of 11,655 crabs from Georgia.

MR. TRAVELSTEAD: Second the motion.

CHAIRMAN O'CONNELL: I think that is seconded by Jack Travelstead. Any discussion on the motion? Seeing none, any public comment? Seeing none, is there any opposition for this motion going forward? Seeing none, **the motion stands.** Louis Daniel.

DR. LOUIS DANIEL: Mr. Chairman, I just wanted to thank Georgia but also Brad did a good job ushering this through and I really appreciate the help from him and staff.

DEVELOPMENT OF A WORKGROUP TO IDENTIFY SHOREBIRD INFORMATION NEEDS

CHAIRMAN O'CONNELL: All right, moving on to the next agenda item, at the last management board meeting the staff was tasked with developing a workgroup to identify shorebird information needs. Brad Spear is going to provide an overview and I think David Perkins is going to help out with that as well.

MR. SPEAR: The workgroup got together by conference call last week, and the report from that workgroup was handed out to you at the beginning of this meeting. It was not included on any of the briefing of supplemental materials. The participants on the workgroup from the board were Dave Perkins from the Fish and Wildlife Service, Pete Himchak and Jack Travelstead; and from the technical committees, Mike Mallard, Greg Breese and Dave Smith; and Bob Beal and myself staffed that workgroup.

The primary findings from that workgroup were that the board's shorebird informational needs fell into four categories. Those categories are listed in your document on Page 1. The workgroup also found that

there were at times inconsistent and untimely reporting of shorebird indices; also, that the Shorebird Technical Committee was administered under the U.S. Fish and Wildlife Service as was originally requested by this board, and that committee did not operate under the same guidelines as ASMFC technical committees.

The final finding was that shorebird stakeholders were not satisfied with their value-based inputs through the joint technical committee meetings, and this was largely their input into the ARM Framework in its development. The workgroup came up with a list of recommendations, and, Mr. Chairman, I would like to pass the microphone to Dave Perkins to talk about that.

DR. DAVID PERKINS: I think we had a good workgroup. It was very robust, lots of good discussions and lots of different perspectives. In making our recommendations, we were trying to take into consideration the information needs of the board. We also wanted to maintain support for the ARM Framework from both the horseshoe crab and the shorebird communities.

We wanted to clearly delineate and distinguish the scientific and technical input that the board receives from the more value-based and advocacy input. That was the basis for leading up to our recommendations. I will quickly run through all four them and then we can come back around and flesh them out in a little bit more detail.

The first one was that we would – well, first, I would say also that we thought it was valuable to try to shift the governance of some of the shorebird activities under the ASMFC directly, and so we are looking at ways to do that. The first recommendation was to establish a shorebird advisory panel that would report directly to the Horseshoe Crab Management Board.

It would be analogous to the current advisory board but would represent some of the other conservation and shorebird interests, so it would give them a definite clear place for their input to be had. The second recommendation was to establish a Delaware Bay Ecosystem Technical Committee that would focus on those regional aspects of horseshoe crab and conservation in general.

Thirdly was that we recommended that the ARM Framework be implemented directly under the purview of ASMFC, and that the way that we would do that is by establishing a subcommittee under this Delaware Bay Ecosystem Technical Committee. If

these first three recommendations were adopted, then they would supplant a lot of the current operations of the Shorebird Technical Committee and so that committee could be disbanded and thanked for their service over the past eight years and go from there.

We had discussions about how this could work organizationally, and I think, Brad, you can show the two different diagrams. Under both of these options, the Shorebird Advisory Panel would report directly to the management board. Under Option 1 the new Delaware Bay Technical Committee would report directly to the management board, and underneath that is the ARM Subcommittee that would do the modeling work.

The second option to have the Delaware Bay Technical Committee be a subcommittee, if you will, of the Horseshoe Crab Technical Committee, and then the ARM would be under that. In a sense there are two different sorts of perspectives on the options here. Option 1 was looking at trying not to devalue the Delaware Bay work and the committee's actions, but Option 2 recognizes that there may be some angst with the board receiving advice from two separate technical committees.

We didn't come to consensus or any sort of majority opinion on those two options and so we presented them both to you. There was consensus upon creating an advisory panel and creating a second technical committee.

CHAIRMAN O'CONNELL: Thanks, David, and just for clarification, if we go forward with one of these options, obviously there are some new bodies being formed and the commission staff would work with the states to come up with nominations for the board to approve the membership for these bodies. Pat.

MR. AUGUSTINE: Are you ready for a motion? Do you want to treat them collectively or individually, Mr. Chairman?

CHAIRMAN O'CONNELL: I think we can try to treat them collectively.

MR. AUGUSTINE: That's fine. Mr. Chairman, I move that we put the recommendations of the group – move to accept the recommendations of the Shorebird Informational Needs Workgroup and hopefully they will be clarified in the body of this. I would refer to Option 2 as opposed to Option 1 under Item 2. The committee would report to the

Horseshoe Crab Technical Committee or do we want both options in there and let the board decide later?

CHAIRMAN O'CONNELL: I think it would be preferred that the board picks one of the options today.

MR. AUGUSTINE: Excellent; thank you.

CHAIRMAN O'CONNELL: I think it would be helpful to get that included in the motion, Option 2.

MR. AUGUSTINE: Yes, Option 2, Item 2.

CHAIRMAN O'CONNELL: We have a second for that motion by Jaime Geiger. Let's just wait and get the motion up there and we will read it and get some discussion on it. **The motion is to move to accept Option 2 of the recommendations of the Shorebird Informational Needs Workgroup. Motion by Mr. Augustine and seconded by Jaime Geiger.**

MR. AUGUSTINE: Mr. Chairman, that does include language for Recommendation 1 and this is two under item two. Okay, that is and then the subcommittee will be underneath that.

CHAIRMAN O'CONNELL: Any discussion on the motion? Peter Himchak.

MR. HIMCHAK: I just wanted to voice the viewpoint of some members, and, yes, this was debated back and forth, and we did not want to diminish the importance of the Horseshoe Crab Technical Committee, but there were a number of us that thought in the beginning that Option Number 1 would simplify the process.

You have the ARM Group essentially dealing with the ecosystem team and then they would come right to the board and say this is what you need for Delaware Bay. We didn't know that you needed an extra layer of review by the entire technical committee. Perhaps in future years the Ecosystem TC could operate underneath the technical committee but, you know, either way I think it is a welcome relief to the board to get this ecosystem team to sit through the horseshoe crab and shorebird data sets and come to the board with a single message, and this is definitely a welcome sight.

I just had one question. I'm still trying to figure out – the Ecosystem Technical Committee still has to be populated with members, and I'm still confused over who is actually on the ARM Working Group, how many members and who they are. That's all.

MR. MILLER: Aside from Peter's concern of who is on the Delaware Bay Ecosystem Committee, I would have the same concern. I see the potential for some of the same people having to wear multiple hats and perhaps unnecessarily duplicating and increasing their workload in that regard.

I want to weigh in on my opinion that I don't think it would be in our best interest to have the Delaware Bay Ecosystem Technical Committee report directly to the Horseshoe Crab Technical Committee because I think some of the concerns that have arisen over the years, that would magnify them in my view. I instead would favor the Delaware Bay Ecosystem Technical Committee reporting directly to the board; or, in other words, Option 1.

Even though it complicates the process because it has two different boxes flowing into the board, I think some of the concerns that have been expressed over the years by the shorebird interests and in regard to fairness within the technical committee I don't think that Option 2 – I think Option 2 would further those concerns, if I may. Thank you.

MR. AUGUSTINE: Mr. Chairman, based on the comments from Mr. Himchak and Mr. Miller, I would gladly change Option 2 to Option 1, if the seconder agrees with that.

CHAIRMAN O'CONNELL: Jaime, is that okay with you? Yes, it is. Let's see if we can get that reflected in the motion, the Option 1. Jaime.

DR. JAIME GEIGER: Certainly, I support this. Again, what I would ask is, again, I would think in the spirit of adaptive management let's try how this works after a year. Certainly, the board can re-examine the organizational structure and who reports to whom, but I think the arguments have been well made and I certainly support it as it is. Thank you.

MR. TRAVELSTEAD: Actually I was going to speak in favor of Option 2 that was a part of the original motion, but I guess I didn't get my hand up in time. I think Jaime just made a good point that this isn't going to be a deal breaker either way we go; and if things need to be changed a year from now or two years from now, I guess we could do it.

I just saw Option 2 as being actually cleaner. I think the board gets confused when it is getting technical advice from two different groups, and I saw Option 2 as sort of having the technical committee serve as a filter of all of the technical advice that might be

coming up from either the stock assessment subcommittee or the Delaware Bay Ecosystem Technical Committee. It just seems simpler and more in line with the way the ASMFC process has been in other boards. I guess I saw the Delaware Bay Ecosystem Technical Committee sort of as a subcommittee on the same level as the stock assessment subcommittee, but I can live with this.

CHAIRMAN O'CONNELL: Thanks, Jack. It sounds like the board is generally supportive of either option and recognizes that we will have to see how it works out. Before we take a vote, is there any public comment on this issue? Rick Robins.

MR. ROBINS: Mr. Chairman, I really appreciate the fact that the board has taken this issue up and the work of the working group that you convened to address this issue because I think there is a significant public interest issue here in terms of moving forward with taking steps that would separate technical advice from advocacy. I think the proposed model will do that effectively. I would just ask that – there is a second component as it relates to structured decision-making where there are provisions for stakeholder input.

The way the boxes have been diagramed, I would ask if the APs are going to have an opportunity to provide input to the Delaware Bay Technical Committee when it is at these critical points in re-evaluating the ARM. For example, in that multiyear review process would the APs be commenting directly to the technical committee or would the AP output flow through the board back down to the technical committee group?

I just have a question about that because I think there are two issues. One is certainly a governance issue and dealing with the potential for impaired objectivity and safeguarding against that with some governance standards. The other is providing for structured stakeholder input. I would just ask how that stakeholder input is going to flow through the APs to the modeling group or to the Delaware Bay Subcommittee.

MR. HIMCHAK: Mr. Chairman, I thought it was the majority opinion of the working group that the advisory panels from both the shorebird advisory panel and the horseshoe crab advisory panel would be invited to meetings of the Ecosystem Technical Committee as official observers and they would still be able to report on behalf of their respective advisory panels to the board.

It says it specifically under Recommendation 1 where the Shorebird AP can send its chairperson to the ecosystem team, but there is no mention about the Horseshoe Crab Advisory Panel also being an official invitee of the ecosystem team, so I would add that should be clarified. Thank you.

CHAIRMAN O'CONNELL: Thanks, Peter. Does any answer your question, Rick?

MR. ROBINS: Yes, indeed, just as long as that is a matter of the record. Thank you very much.

CHAIRMAN O'CONNELL: Any other public comment. **All right, I'm going to read the motion into the record: move to accept the recommendations of the Shorebird Informational Needs Workgroup, including Option 1 of Recommendation 2.** Motion by Mr. Augustine; seconded by Dr. Geiger. Is there any opposition to the motion? Seeing none, **the motion carries.** The last agenda item is a review of the fishery management plan and state compliance.

FISHERY MANAGEMENT PLAN AND STATE COMPLIANCE REVIEW

MR. SPEAR: Up on the screen is a chart of horseshoe crab bait landings and biomedical harvest. The bait is the red bars and the biomedical harvest, which includes crabs harvested for biomedical purposes and as bait. Going to the next slide, reported landings in 2009 were 734,000 crabs. There were small decreases from the previous year in Massachusetts, Connecticut and New York. By far the largest increase was in Virginia for the bait fishery.

Total number of crabs brought to the biomedical facilities in 2009 was a little over 512,000 crabs. That was essentially the same level it was the previous year, but still a 20 percent increase over the previous five-year average. That information was included in the FMP Review on the Briefing CD in Table 1.

The PRT estimates coast-wide mortality of horseshoe crabs from the bleeding process and the transportation process; it applies a 15 percent mortality of the crabs that are not counted against the bait state quotas. For 2009 that estimate came out at just above 60,000 crabs, which is above the FMP threshold of 57,500 crabs.

Again, that is using the technical committee recommended 15 percent mortality estimate, which is

on the higher level of estimates in the literature. The FMP requires the board to consider action if that estimate is above the threshold. The PRT finds all states in compliance. The District of Columbia did not submit a report, and this is for many years in a row now.

The plan review team recommends that the District of Columbia request removal from the board. This is similar to an action that Pennsylvania recommended years ago where a regulatory loophole was closed and there are no landings allowed in the District of Columbia. In 2009 Delaware, Virginia and North Carolina exceeded their quotas.

Virginia also violated the COLREGS requirement in Addendum V, but has since initiated regulatory changes to avoid that in the future. North Carolina's overage has now been dealt with through the quota transfer. In the other states the 2010 quota will be reduced accordingly. The states of Maine, New Hampshire, PRFC, South Carolina, Georgia and Florida requested de minimis. They all qualify so the PRT recommends granting de minimis status. New Jersey qualified but did not request de minimis.

MR. AUGUSTINE: Mr. Chairman, a question on the report, on the 15 percent mortality rate; how is that generated? Is it based on actual surveys or actually just an estimate or does anyone actually go to a bleeding station and follow the horseshoe crabs through the process?

MR. SPEAR: That number came from – well, the technical committee looked at a range of studies that have been conducted. The studies used different methodologies that are from different regions. They very difficult to compare to each other, but in looking at the range of percentages of mortality through those studies the technical committee felt comfortable with the 15 percent.

They recognize that is in the higher estimate in the literature and also recognizing that there are some limitations with that number. If you recall from the advisory panel report, there was a recommendations from the AP to report a range of percentages and not just the 15 percent, sort of reflecting the range in the literature.

MR. AUGUSTINE: Follow on, Mr. Chairman, well, in view of the fact that the mortality should have been or 55 or so thousand, it was actually over 60; and if the FMP calls for that 15 percent, do we need to put a control on the harvest number or is it just a guideline of some sort?

CHAIRMAN O'CONNELL: From my understanding, the FMP has a threshold and if exceeded that threshold, the board considers to take action. I don't think this is first year that we've exceeded that threshold and recognizing that the technical committee is using a higher level of mortality applied to that number of crabs bled, I guess it is up to the board as to whether or not we want to allow that to continue and just keep a close eye on it or take some action today.

(Whereupon, the meeting was adjourned at 5:12 p.m.,
May 4, 2010.)

MR. AUGUSTINE: Well, Mr. Chairman, it would seem to me we would want to take a close look at it in view of the fact there has been an increase in harvest of 20 percent above what we had in previous years; and if this is a trend, I think it raises a little red flag, not a big red flat but a little red flag that we really should watch the trend. If we have two or three years in a row where we're exceeding what our original guideline was based on what the technical committee recommended, I think we have to watch that close enough so we don't actually allow that harvest and mortality rate to continue at the rate it is going. Then as a follow-on, do you need a series of motions on all those recommendations or not?

CHAIRMAN O'CONNELL: Yes, and whether or not the board wants to take action on the biomedical industry mortality, we have de minimis states and then approval of the FMP Reviews.

MR. AUGUSTINE: It doesn't look like anybody jumping up and down on that one, so I would advise the technical committee to keep a close eye on it and see what the result is of this coming year. Other than that, I would like to start a series of motions. **Okay, move to accept the FMP Review and State Compliance Report including de minimis status for Maine, New Hampshire, Potomac River Fisheries Commission, South Carolina, Georgia and Florida.**

CHAIRMAN O'CONNELL: Thanks, Pat, and Bill Adler seconds the motion. Any discussion on the motion? Seeing none, any public comment on the motion? All right, is there any objection for moving this motion forward? Seeing none, **the motion carries**. That is the last agenda item for today's meeting. Do I have a motion to adjourn?

ADJOURNMENT

MR. AUGUSTINE: Move to adjourn.

CHAIRMAN O'CONNELL: Motion by Pat Augustine. We are adjourned.