PROCEEDINGS OF THE

ATLANTIC STATES MARINE FISHERIES COMMISSION

ATLANTIC STRIPED BASS MANAGEMENT BOARD

Crowne Plaza Old Town
Alexandria, Virginia
February 2, 2010

Board Approved May 4, 2010

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ATTENDANCE

Board Members

Terry Stockwell, ME, proxy for G. Lapointe (AA)
Sen. Dennis Damon, ME (LA)
Doug Grout, NH (AA)
G. Ritchie White, NH (GA)
Rep. Dennis Abbott, NH (LA)
Paul Diodati, MA (AA)
William Adler, MA (GA)
Rep. Sarah Peake, MA (LA)
Mark Gibson, RI, proxy for B. Ballou (AA)
David Simpson, CT (AA)
Lance Stewart, CT (GA)
Rep. Craig Miner, CT (LA)
Jim Gilmore, NY (AA)
Pat Augustine, NY (GA)
Brian Culhane, NY, proxy for Sen. Johnson (LA)
Peter Himchak, NJ, proxy for D. Chanda (AA)
Tom Fote, NJ (GA)
Gil Ewing, NJ, proxy for Asm. Albano (LA)
Loren Lustig, PA (GA)
Leroy Young, PA, proxy for D. Austen (AA)
Gene Kray, PA, proxy for Rep. Schroder (LA)
Craig Shirey, DE, proxy for P. Emory (AA)
Roy Miller, DE (GA)
Bernie Pankowski, DE, proxy for Sen.Venables (LA)
Tom O'Connell, MD (AA)
Bill Goldsborough, MD (GA)
Russell Dize, MD, proxy for Sen. Colburn (LA)
Jack Travelstead, VA, proxy for S. Bowman (AA)
Kyle Schick, VA, proxy for C. Davenport (GA)
E. Bowden, VA, proxy for Del. Lewis (LA)
Louis Daniel, NC (AA)
Michelle Duval, NC, administrative proxy (AA)
Bill Cole, NC (GA)
Mike Johnson, NC, proxy for Rep. Wainwright (LA)
Steve Meyers, NMFS
A.C. Carpenter, PRFC
Bryan King, DC FWD

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

Ex-Officio Members

Wilson Laney, Technical Committee Chair
Kelly Place, Advisory Panel Chair

Staff

Vince O'Shea
Bob Beal
Chris Vonderweidt
Nichola Meserve

Guests

Dave Gauthier, ODU
Matt Smith, VIMS
Mark Matsche, MD DNR
Dave Perkins, USFWS
Sean McKeon, NCFA
Jeffrey Horne, MD DNR
Eric Durell, MD DNR
Harry Hornick, MD DNR
Rob O'Reilly, VA MRC
Ben Martens, CCCHFA
Shannon Simpson, NOAA
Kevin Rosemary, MD DNR
Chip Lynch, NOAA
Adam Nowalsky, RFA-NJ
Ed O'Brien, NACO
Rob Winkel, NJ
Arnold Leo, E. Hampton, NY
Angela Giuliano, MD DNR
Amy Batdorf, MD DNR
Beth Versak, MD DNR
Bennie Williams, USFWS-DC
Chris Batsavage, NC DMF
Shawn Kimbro, CCA-MD
Greg Shute, MSSA
David Sikorski, CCA-MD
Ed Liccione, CCA-MD
Harley Speir, MD DNR
Matt Lawrence, MD DNR
Carrie Kennedy, MD DNR
Mike Luisi, MD DNR
Dave Smith, MSSA
Howard Townsend, NOAA
Marty Burns, Cape May, NJ
Lynn Fegley, MD DNR
Steve Early, MD DNR

CALL TO ORDER

CHAIRMAN JACK TRAVELSTEAD: Good afternoon. We're going to get the Striped Bass Board started.

APPROVAL OF AGENDA

CHAIRMAN JACK TRAVELSTEAD: The agenda for today's meeting has been distributed. Are there any changes or additions to the agenda? Seeing none, the agenda stands.

APPROVAL OF PROCEEDINGS

CHAIRMAN JACK TRAVELSTEAD: The minutes of the November 2009 meeting have been distributed. Are there any changes to those minutes? Seeing none, the minutes stand as printed. We are on Agenda Item 3, opportunity for public comment; is there any public comment today on any item that is not the agenda?

PUBLIC COMMENT

MR. ED O'BRIAN: My name is Ed O'Brian. I know some of you know me for a long time. I've vice-chairman of the National Charterboat Association, and I am a member and an officer of the Maryland Charterboat Association. Principally in this conversation I am an advisor from Maryland to your advisors group.

The issue I want to bring up is not a pleasant one. It has come up before; I brought it up about three years ago. That is the chronic lawbreaking that is going on relative to this intercept fishery; whether it be off North Carolina in a certain year or Virginia other years. With the fish seeming to move north, it could be off of Maryland next year of the year after.

Gentlemen, it is out control. I know the law enforcement people are trying hard to do something about it, but it has gotten to be a situation that does reflect what all of us that have such concerns for the striped bass and particularly a reflection on this board that is responsible for the spawning stock. The fish that we're talking about in this winter fishery are the same fish that a month later will be in the Chesapeake Bay to spawn.

We're taking significant measures in Maryland to try to protect these spawning fish. We're getting into bycatch, catch and release; certainly our commercial, recreational fisheries, and we are somewhat checkmated by all the people sitting around the table that are well aware with the lawbreaking that is going on in this fishery.

One thing that I would like to see occur that would be very dramatic and set an example would be for communications between this forum and the coast guard to take away coast guard licenses and federal licenses for anybody that gets caught breaking the law down there. That would have a significant effect. I know you all are aware of the problem. It doesn't seem to have really hit a lot of people yet. I know people are trying hard from an enforcement standpoint to solve it, but the game is going on. The success these thieves have had is significant.

They know every game in the book when it comes to communications. When the man is on the way, the word spreads on the cell phones. It needs more law enforcement on the docks. It needs some more technical support when it comes to coast guard assets, whether it be on sea or in the air. I know a lot of people are trying hard on this one, but progress doesn't seem to be there yet, and it brings a certain disrespect for what we're all trying to do to save the striped bass spawning stock. Thanks very much.

MR. MARTY BUZAS: Good morning. My name is Marty Buzas. I am from Cape May, New Jersey. I have had an abstract handed out to you. I'm here this morning to talk about fairness and equability. I strongly and respectfully that ASMFC should reject New Jersey's Striped Bass Plan that shifts commercial quota to recreational for the following reasons:

It is contrary to Standard A7 of ASMFC's Interstate Fisheries Management Program Charter. It upsets the balance of fairness and equity between recreational and commercial fishermen inherent in the ASMFC FMP. It may cause the National Marine Fisheries Service to discontinue deferment to ASMFC's FMP for the management of striped bass in the EEZ.

The National Marine Fisheries Service may reopen the EEZ to commercial striped bass fishing. It gives New Jersey recreational fishing interests an unfair advantage over neighboring states because of larger bag limits. It has created hostilities in New Jersey between the recreational and commercial communities that is spreading to other states making cooperation on other issues more difficult.

The ASMFC Interstate Fisheries Management Program Charter; Standard A7 of the Atlantic States Marine Fisheries Council Interstate Management

Program Charter states the following: Fairness and equity – an FMP should allow internal flexibility within states to achieve its objectives while implementing and administrating by the states and fishery resources shall be fairly and equitably allocated or assigned amongst the states.

Although Section A7 indicates that states should have internal flexibility within their own territories, it allows this flexibility only to achieve the objectives outlined in the ASMFC FMP. This section does not allow states to make changes that change the objective of the ASMFC FMP. ASMFC's Striped Bass FMP called for a set level of commercial harvest based on historic landings.

Each state was allocated and assigned a quota. However, New Jersey transfer of the quota from commercial to recreational was and is clearly contrary to the objectives set forth in the FMP because it upsets the balance between recreational and commercial harvest in the original ASMFC FMP. I respectfully ask this committee finds New Jersey's Striped Bass Program out of compliance. Thank you very much.

MR. SEAN McKEON: Sean McKeon, North Carolina Fisheries Association. Just two quick points; one of them is very similar to the arguments and discussions we heard earlier about scup. As you all know, this is a fully recovered stock for 16 years now or 15 years and change. Fishermen were asked, both recreational and commercial were asked to pay the price for recovery. That recovery has long ago occurred and is continuing, and we feel it is time that the EEZ is opened to striped bass fishing, both sectors.

I speak only for the commercial, but I think there is no reason in the world you can have a number of fish on your boat, I don't see why it matters where you catch them, on your way out or on your way in, it's just ridiculous. It's an enforcement nightmare. That would be alleviated instantly.

I know this commission has in the past sent letters supporting opening up the EEZ, and I would request that you all consider doing that again. It may be time. There may be some opportunities right now to do that. The second thing is I hope that we do increase the quota. One of the problems we're having is even as we talk about an inside fishery, the quotas are just miserably low, and I hope you look at increasing those commercial quotas. Thank you.

ELECTION OF BOARD VICE-CHAIRMAN

CHAIRMAN TRAVELSTEAD: Thank you. We're going to move on to Item 4, nomination and election of vice-chair. Bill.

MR. WILLIAM GOLDSBOROUGH: **I would like to nominate Tom O'Connell as vice-chair.**

CHAIRMAN TRAVELSTEAD: Thank you. Pat, your usual motion.

MR. PATRICK AUGUSTINE: Mr. Chairman, move to accept Mr. O'Connell as the one and only nominee and cast one vote on behalf of the board to congratulate him on becoming the new vice-chair.

CHAIRMAN TRAVELSTEAD: **Any objections to that motion? Seeing none, thank you, Tom**. Moving right along, we have a fairly lengthy technical committee task list. Nichola.

TECHNICAL COMMITTEE TASK LIST

MS. NICHOLA MESERVE: The board will recall that the 2009 updated stock assessment was presented at the last board meeting and accepted by the board. Based on that discussion and also some recommendations from the advisory panel, there were five tasks assigned to the technical committee. The task list was provided in your briefing book, and staff is now handing out the technical committee's full report on the five tasks. The tasks concern the juvenile abundance trigger; implications of Mycobacteriosis; potential recreational catch bias; poaching estimates; and distribution shifts of the striped bass stock.

Wilson Laney will be providing the technical committee report. For the second task on Mycobacteriosis, based on the technical committee recommendation, Dave Gauthier of Old Dominion University, Matt Smith of Virginia Institute of Marine Science and Mark Matsche of Maryland DNR have been invited to provide some information on Mycobacteriosis to the board. For the poaching estimates task, there was a memo from the Law Enforcement Committee provided in your briefing book and Mike Howard is also here to take any questions about that memo.

TECHNICAL COMMITTEE RESPONSE TO TASK LIST

DR. WILSON LANEY: Thanks to staff, especially Nichola for tremendous staff support on this and also

to all the other members of the technical committee, some of whom are here today. I think Dr. Sharov, who is the vice-chair, is in the back as well. The five tasks, Nichola has already reported to you. What we're doing here is just giving you the bulleted summaries on the board up there. Then if you have additional questions, I think the chairman's preference was that we go through all five tasks and then take any questions at the end.

Task 1 was for us to take a look at the juvenile abundance index trigger. Our findings from that – let me just say that we established a subcommittee chaired by Alexei Sharov and consisting of Rob O'Reilly, Charlton Godwin, Carol Hoffman, and Vic Crecco to take a look at this. That working group has come back to us indicating that we shouldn't use truncated time series for evaluating the JAIs relative to the management trigger. The reason for that is that the complete time series are much more representative of the range of natural variation in recruitment and include years that we think are typical of recruitment failure, which could serve as a reference for defining poor recruitment events. That's why we're recommending the complete time series.

The technical committee also recommended the use of confidence intervals to limit comparison of index values to those that are significantly different and the use of a fixed time series for the trigger. Those are both on the board. Finally, the technical committee proposes a work plan for completion by May of 2010 to further review each JAI and the definitions for recruitment failure and the trigger.

If we go to the next slide, this is the backbone of the work plan right now. There may be additional items, and Alexei could speak to that if anybody has a question, but basically what we're proposing to do is to validate each of the JAIs as indicators of future year class strength – I know Delaware has already provided us a report on their validation – to identify low recruitment periods in each time series; to suggest the best suited criterion for recruitment and failure; to determine the probability of two or three consecutive years of recruitment failure and evaluate that as a indicator of consistent failure; to explore various lengths of fixed time series to determine the most suitable fixed period for use as a reference for future determination of recruitment failure; and to select system-specific confidence intervals around the JAI values for use in future comparison.

With that, I'll move on to Task 2, which is the implications of Mycobacteriosis. The technical committee had previously evaluated the effect of an increase in natural mortality on the age-based model results through sensitivity runs that we did for the 2007 benchmark stock assessment. Changing the input parameter for that base run in future assessments will require some empirical evidence from field studies, and those are currently ongoing, but they haven't been completed yet. A couple of the tag-based models that were used to assess the stock don't require an assumption of the value of M.

Here the technical committee evaluated the effect of increasing M at age from the 1999 through 2008 period, which is when we believe Mycobacteriosis has manifested itself, on the 2009 age-based recruitment results. The variable M run basically resulted in higher recruitment and total abundance for all years, a higher SSB, higher age 8+ and total biomass in all years except 2007 and 2008 and a lower F rate in most years except 2007 and 2008.

Stock projections with an increasing M would likely result in more significant effects than the short-term effects that we modeled. Again, the folks that did this work, if you go back to the previous slide, were Gary Shepherd and Vic Crecco. If M is as high as it is simulated, then management has limited options to control stock dynamics via regulations because fishing mortality is only going to represent a small proportion of the total mortality.

On to Task 3; this was done by Gary and Vic as well. This one responded to the board's request to look at the potential MRFSS bias in the recreational estimate. Gary and Vic evaluated that in a couple of different ways. The 2009 SCA Model was rerun with two revised time series of recreational removals, and then we used an index-based approach which Vic developed, and that was run with the original MRFSS estimates and two revised time series of recreational removals.Both of these resulted in lower estimates of stock size and lower estimates of F. If the recreational removals had been overestimated as we simulated them, the stock status determination does not change.

The technical committee did not attempt to validate the methods used by Vic and the two papers that he has written for us because the board's task didn't request us to do so. In consequence, we're recommending a review of Vic's papers by the MRFSS staff with the view toward determining whether there is a potential significant impact on stock assessments for recreationally exploited species in addition to striped bass if the conclusions of this analysis are confirmed.

Okay, on to Task 4, Gary Shepherd did this one, and, of course, Mike Howard and the Law Enforcement Committee had significant input to us, and you've got Mike's memo. The poaching estimates; the poaching removals are not routinely included in the assessment catch at age because no estimates are available from throughout the jurisdiction.

There is no requirement for estimating poaching as part of the management program. The only data that we have are what we've characterized as honest sublegals from the MRFSS. In other words, those are the fish that are measured at dockside and are below the legal size limit. These don't estimate intentional recreational poaching or illegal commercial harvest, either one.

The Law Enforcement Committee memo notes to us that available illegal harvest data are inadequate, and that there are quite a few hindrances to collecting adequate data. Therefore, we are recommending that a workshop between the Law Enforcement Committee and the Technical Committee representatives – I think probably we should throw the advisory panel into that as well – would be necessary to design appropriate methods for collecting poaching data for assessments if that is possible.

We've kicked some things around, but we don't have anything ready for primetime yet. We've discussed some possibilities. Finally, to address the board's question, we did simulate poaching by using a 10 percent, 20 percent and 30 percent increase of the catch at age in the SCA Model and we acknowledge up front that approach is very overly simplistic simply because you can't expect poaching to be constant across years and occur in the same proportion at age as other removals. When we did this, we got increased recruitment and SSB and no change in fishing mortality.

The final task was to try and take a look at possible distribution shifts in the stock, and here Gary Shepherd took at look at the Northeast Fishery Science Center Trawl Survey data. A group from Massachusetts, Hoffman Dean, Gary Nelson, and Mike Armstrong, took a look at the Massachusetts acoustics telemetry study, and I, working with Ian Park, have taken a look at the data from the Cooperative Winter Tagging Cruises.

What we've discovered from this look-see so far is that if you look at the Northeast Fishery Science Center data – and Gary looked at the average distance and minimum distance from shore where striped bass has been caught for the past 21 years – it doesn't appear to have systematically changed.

If you look at the Massachusetts Acoustic Tagging Data – and they've been basically putting acoustic tags in striped bass, releasing those in the EEZ on Stellwagon Banks, I believe it is – 91 percent of the fish that they tagged out there were detected in these VR2 listening arrays. It is a device that we station in probable migratory pathways that can detect these acoustic tags when a fish passes by – 91 percent of those fish were detected entering state waters generally within several weeks of release.

I think it was within 11 days in 2008; it was in 15 days in 2009. Nobody is surprised I think that fish move. They don't stay in one place. I think we're all pretty much aware of that. As far as the Cooperative Winter Tagging Cruise data, we're still looking at those. The winter distribution for the last three years has shifted further north than in the preceding 20 years or so.

During 2009 concentrations of the fish were much further offshore, but only continued sampling during that time of the year will indicate whether this is a long-term trend or not. The bottom line for this is that overall we have little information available on inshore and offshore movements. Reliable conclusions about the distribution offshore could be made only if we have a well-designed study that is funded and completed. Mr. Chairman, that concludes my report, and I will be happy to entertain any questions or defer them to those who can answer them.

CHAIRMAN TRAVELSTEAD: Thank you, Wilson. Let's go back to the first task and work our way through. Any questions or comments on Task 1 dealing with JAI triggers? Mark.

MR. MARK GIBSON: Could you put the slide back up for that? It was the slide on the anticipated response. It was my thought, and I would like to hear Wilson's. I wasn't present for the formulation of the work plan, but it seems to me is you're talking about doing some sort of a risk analysis here where you simulate three consecutive failures in a row or something that the technical committee deemed would be a recruitment signal and see how that works its way through the population projection and then make a determination if the fishing mortality rates that we have now are sufficient to buffer that level of failure.

Three failures in a row, if we have a low enough F, that that's going to be buffered through the age structure and the output population or, no, it is not going to be buffered, and you would need – you could only absorb two failures in a row or you would need a reduction in fishing mortality to a certain amount to buffer that occurrence.

Then it would be up to this board to determine, well, what kind of risk do we want to take; have we ever had three failures in a row in the time series; have we ever had four or is two commonplace? You know, we've had ups and downs from the beginning of the Maryland JAI, if I remember it correctly.

That's my thoughts on how you might want to get traction on that to put something back in front of the board that we could then look at and say, all right, the odds of that happening are not very high; we've never seen four in a row; you know, we had periodic boomers back then; or, no, that has happened before, and our population projections suggest that our management system can't buffer that right now. That would be my thoughts and some feedback to the technical committee on that.

DR. LANEY: Thank you, Mark. Yes, I think – and I'm going to defer to my colleague, Dr. Sharov, on this; and if Alexei wants to weigh in on this, I'd invite him to come to the public microphone, but I believe, Mark, that's generally the way they're thinking. If you look at number four on the research plan up there, I'll read directly from the memo, "a probability of two to three consecutive years of poor recruitment and existing time series will be determined and evaluated as an indicator of consistent recruitment failure."

I think we could certainly couple that, then, with what you're suggesting. Alexei, do you have any thoughts or comments on that? He is giving me the okay signal, so I think I must have said something that was generally correct.

MR. PAUL DIODATI: I think those are good suggestions that Mark makes back to the technical committee, but I guess my question about the current requirement in the plan to trigger a signal for us is one issue of whether or not is of any high value for managing the resource. I'm more concerned that we're already seeing below average recruitment coming out of the Chesapeake for several years now.

I think we're looking at about six years, the past six years, and if this year coming up is also below, we're looking at about seven years of below average recruitment coming out of the Chesapeake. Although I appreciate the technical committee trying to determine what would be the best approach, I think we need a quick answer as to whether or not this board needs to be looking at some type of correction in the way we're managing striped bass.

If we get that in May, I think you said somewhere in your presentation, but I don't want the technical committee to come back in May and say this is the way we should be looking at the analysis, and then we'll have to wait three or four more months to get the answer. I appreciate the technical committee comes back with a new methodology and an answer about the signal, something about that signal that we're seeing.

DR. LANEY: Yes, Paul, it's my understanding that is the intent, is to come back to you with a very specific recommendation in May. Again, if you look at those specific work item bullets, I think the issue of the trigger is addressed on a stock-specific basis. I think May is pretty timely for us to get back to you on that point.

If you do look at Figure 1 there, which is the Maryland Striped Bass JAI in geometric format, if you look at the past six years, it definitely has been declining for the past six years. There were some relatively high values in there, so who knows what it is going to do this year. You're well aware striped bass have a tendency to produce dominant year classes on like a seven-to-eight year frequency or so, so we could get a dominant one this year. I think your question is going to be answered in May.

CHAIRMAN TRAVELSTEAD: Further comments on this issue? Therefore, there is no objection with tasking the technical committee to proceed as they've outlined and as modified by the comments we've received. We'll look forward to your report in May, Wilson. Let's go to Task 2, the myco issue. Any comments on that?

Seeing none, we'll move on to Task 3, the MRFSS Bias Issue. The technical committee is recommending that the issue be reviewed by the MRFSS staff, and it is my understanding that Connecticut has also asked the National Marine Fisheries Service look into that issue. Any questions or comments on that? Paul.

MR. DIODATI: I'm just wondering if we need a formal request from this board to I think it might be National Marine Fisheries Service Division that oversees the MRFSS to review Dr. Crecco's work in

context with the way they conduct the survey and whether or not we should be concerned about any of that.

MR. STEVE MEYERS: A note would be appropriate. We feel that this report definitely needs to be peer reviewed. We have some major issues with it. I have almost three and a half pages of talking points, which I'll not take up this board's time with, from our staff on the Marine Recreational Survey. There are some points that have been raised here that, again, we have some serious issues with, and, yes, this needs to be peer reviewed – independently peer reviewed and not just necessarily by the National Marine Fisheries Services. Thank you.

CHAIRMAN TRAVELSTEAD: Paul, you're asking that a letter be sent from the board to the Service asking for a review of this issue?

MR. DIODATI: Yes, I think that would be appropriate based on Steve's response, but his response also concerns me that their response to our letter might be we want a peer review, an outside peer review of Dr. Crecco's report. I would appreciate something a little quicker than going through that kind of a process.

I think that there are folks with high levels of expertise within the National Marine Fisheries Service that are very familiar with the way the MRFSS estimates are generated. They can read Dr. Crecco's impression of possible corruption in those procedures, so they should be able to determine whether or not there is any credence or not; and if there is, then perhaps a peer review.

CHAIRMAN TRAVELSTEAD: Very good. David.

MR. DAVID SIMPSON: I just want to make two quick points. One, in my read of all of this, it seems the most recent status report, I think it was called, from the MRFSS Program was about a 19-page report said much of what Vic has said, that with low response rates, development of cell technology, caller ID and so forth, that they're getting very concerned that the population of people they can reach may look very different from the general population, and that threatens the expansion.

They make a bunch of other points that I think sort of reinforce that Vic is really looking at things that the National Academy of Science has pointed out and in fact has inspired the National Angler Registry. I think there is a lot more agreement that there are reasons to be concerned than two or three pages of notes might suggest.

Also, I think the immediacy of this is borne out by the assessment of the impact of levels of poaching, 10, 20, 30 percent, that all it does, when you put more fish into the landings is elevate the estimate of stock size. As Wilson pointed out, that's fine if it's constant, but Vic's concern is that it's not constant. The overestimation of harvest in the recreational fishery is not constant.

It is accelerating, and that would lead us – correct me if I'm wrong – lead us to conclude that the striped bass population is larger today than it really is, to erroneously conclude that, so there is a bit of urgency for striped bass on this one.

CHAIRMAN TRAVELSTEAD: Any response, Wilson?

DR. LANEY: That is my understanding, Dave; and, again, I'll defer to Alexei if his understanding is different than that, or to Nichola, either one, but, yes, that is my understanding.

MR. MEYERS: Mr. Chairman, we have serious issues with many components of Dr. Crecco's report. We are, of course, in the process of redesigning our recreational survey. We have several pilot projects that are in process right now that deal with many aspects of improving the survey, some of which are touched upon in Dr. Crecco's report; some are not.

I would hate to reinforce the observations from the gentleman from Massachusetts that there is a systematic inappropriate way that we are doing this. We're looking for a review of this, a peer review. We're looking for a way of scrubbing this and making sure that we have excellent information needed to manage this resource in a timely manner. Thank you, sir.

MR. GIBSON: I would just support Paul's view that we need an independent review and advice on this sooner rather than later. It's true that the status of the stock doesn't change, but if you're looking at Figure 3 and Figure 4, that you could easily imagine where we'd if we were computing annual quotas for striped bass based on a stock assessment, one that had a correction in it and one that didn't.

You know, target fishing mortality rate multiplied by a substantively reduced stock size would generate smaller quotas, so there are implications far beyond striped bass of this possible problem, particularly in

those stocks – and we debated some of the issues this morning about stocks when we do have annual quotas set and they are prorated by regions or among states and in between sectors.

I think it's very important issue that can't wait for a long-term MRIP revision because there are management programs that are reacting every year to MRFSS estimates, projections and quotas that have been calculated from assessments in which MRFSS data plays a heavy role. I would urge expedited external review of this purported problem and advice back to this board.

CHAIRMAN TRAVELSTEAD: Any other comments on this issue? Vince.

EXECUTIVE DIRECTOR JOHN V. O'SHEA: I think there are two issues here that I've heard. One is some communication back to MRFSS, but it is my understanding that perhaps Mr. Simpson may have already communicated to MRFSS to review Dr. Crecco's thoughts. I'm not clear whether the board is thinking that in addition to that we need to send a letter.

Then the second question is maybe one of sort of a responsibility, I suppose. I understand the notion that if the board were to consider using Dr. Crecco's thoughts, the value of having an external review of that, but it's not clear to me why that would be an ASMFC obligation to get an external review of a paper critical of a NOAA Program and MRFSS; why would that then become a responsibility of ASMFC? I'm not totally clear on that.

CHAIRMAN TRAVELSTEAD: Yes, I think you've outlined it pretty well. It seems to me we send a letter that asks for a fairly quick answer on this, and whatever methodology the Service chooses to come up with that answer is up to them. I think the other issue is whether or not this issue could be elevated or should be elevated to the policy board inasmuch as it affects more than just striped bass.

I certainly don't have any objection to sending the letter that Paul has suggested, and I'll ask if there are objections let us hear them, but we also might want to raise this to the policy board level so that is coming from the commission and not just the Striped Bass Management Board. David.

MR. SIMPSON: Yes, I agree with that because it does affect more species than striped bass. It just happens to be the one that Vic used as an example to work through. I guess what we really need to do is step back and say we had this national level review of the MRFSS Program. It identified a number of issues and concerns.

The folks at MRFSS are working very hard to put in place a number of very significant changes as to how they do their work to help improve in the future the reliability and accuracy of their estimates. The problem for the commission and the National Marine Fisheries Service is what do we do in the meantime?

It's right now we're working with the old MRFSS. I know they're working on a new model, but we're working with the old MRFSS now. There are significant concerns that are acknowledged and undisputed widely, and yet we have to make sometimes very – always very difficult decisions on what to do and how much to react to these numbers, whether it's scup or black sea bass or striped bass.

It's not enough to say we're working on it, it would be better in five years, because we have to make significant management decisions now that impact people's lives, whether it's their sport or their living, based on these things. If there is a reason for a review, an immediacy, that's it. It's not to get an answer to Vic. It is to give us an answer on what do we do in the meantime?

MR. DOUGLAS GROUT: Mr. Chairman, I agree with your suggestion that we bring this up to the policy board, and I agree with Dave that the decisions we're making right now and have been making in management are dealing a lot with allocation; allocation within the sectors right now. We're allocating the resource; and if the figures that we're using are inflated or underestimated, that has a huge impact on both recreational and commercial fishing. I do think this is something that is very important that we try to address in a very timely manner on a broad scale.

CHAIRMAN TRAVELSTEAD: Is there any objection to elevating this issue to the policy board and dealing with it solely at that board level? Okay, then that is what we'll do, we'll add that to the policy board agenda and bring it up there and proceed. Okay, seeing nothing else on that one, let's go to Task 4, the poaching issue. Wilson, you mentioned a possible law enforcement/technical committee workshop. You didn't give us any timeframe on that. Any thoughts on if that's even possible to do and when you might be able to get back to us with some results?

DR. LANEY: Well, Mr. Chairman, that's what we discussed as something that would need to happen before we could get back to you with anything more definitive. Mr. Howard may want to weigh in on that point. He was on our conference call along with the chairman of the Law Enforcement Committee.

MR. MIKE HOWARD: We can make it happen pretty well within 30-days notice. The chairman would appoint a subcommittee. At the spring meeting we could have results if you want to have it by the spring meeting. The memos we've exchanged do point out many variables that would have to be overcome and the problems within states in their data collection of what types of violations, the size of the fish, et cetera.

MR. DIODATI: I guess this particular issue is a good example of why it's important to get answers more quickly because Mike's report on this is that the enforcement members of the committee have been looking at trying to determine poaching rates for the past 20 years and have not been successful.

I can appreciate the recommendation of a joint meeting of the technical committee and the committee, but I guess I'm curious why that has never happened. It has taken us 20 years to maybe bring a different level of technical expertise into it. I think that is a problem, and I'm not sure why it has gone on that long.

I also would like to go back – there was a member of the public that spoke earlier about the intercept fishery that takes place, and I think his comments are very relevant to this poaching issue. There were a number of speakers at the beginning of the meeting. Are we going to have an opportunity to go back and ask some questions or discuss a little bit about those comments made earlier or should I do that now on Mr. O'Brien's comments?

CHAIRMAN TRAVELSTEAD: Why don't you go ahead now, Paul?

MR. DIODATI: Well, it seemed to me that Mr. O'Brien was speaking about the winter intercept fishery that takes place in the ocean on larger fish that eventually will become spawning fish. A lot of these end up in the Chesapeake. What we didn't hear about was – well, he inferred that fishery was illegal, so I imagine it is taking place in the EEZ. I think that is the illegal component.

What I don't know is what is the magnitude of the harvest that we're talking about, and is that harvest being recorded in our statistics programs or is this outside of our knowledge? Those are my questions about that catch. I don't know if anyone can enlighten me on, number one, the size of the catch. Are we talking 50,000 pounds or something larger than that and is that fishery being recorded in our data collection programs?

CHAIRMAN TRAVELSTEAD: I can give you some information, but, Wilson, did you have a response?

DR. LANEY: Well, I'll give it a shot, Mr. Chairman, and you can chime in. Right now, Paul, only North Carolina gets estimates of the Wave 1 harvest from that winter fishery. What the technical committee has been doing and the stock assessment subcommittee has been using the tag returns from the Cooperative Winter Tagging Cruise to generate an estimated harvest for the Virginia portion of that fishery based on the ratio of the tag returns from the two states.

Again, I'll look to Alexei and Nichola to correct me if I misspeak, but I believe that's the way we've been doing it. I don't know off the top of my head what the magnitude of that particular fishery is, and I'll ask Mr. Howard if he wants to address it. The Law Enforcement Committee did some back of the envelope sort of calculations as to what the possible extent of an illegal fishery from the EEZ could be, if he wants to address that, and I think we both will stress these are back of the envelope, very rough calculations.

MR. HOWARD: First, there is a substantial fishery going on in the EEZ as the fish move southerly and has occurred since the EEZ was closed and the seasons were opened up and down the coast. Many states have had a lot of success and have significantly reduced the illegal harvest in the EEZ.

However, for the past three or four years a substantial fishery with substantial economic impacts is occurring in the EEZ out to 30 miles out, from the mouth of the Bay at this stage. For a couple of months it is ongoing; and although law enforcement efforts are significant, they have failed to curtail that fishery. Some of those fish are getting counted; I'm aware of that. A lot aren't.

I'm here to tell you a lot of those fish are getting filleted. It's primarily a recreational fishery and charterboat fishery. I think that's about all I can say about that. If you have complaints on that fishery, they ought to go to the individual states. JEA funding

funds the enforcement to a modest amount off the Virginia coast. They are not sufficient to adequately control the issue. There is no JEA agreement in place in North Carolina. I spoke with the colonel.

In fact, if you heard the phone, we're playing phone tag, and I wanted to know if he had an update that could be released today. They are concerned about it. They're concerned about the snuffing the nose at the existing EEZ regulations in that area and the blatancy for which this is occurring.

The second issue is measuring compliance and the 20 years, if I could just one quick second on that. Law enforcement is a science. It can be determined the rate of compliance and the rate of violations and all the information you want. The issue is funding. These guys have barely got enough to go out there and make a case and record that they made a striped bass case in their computer systems.

There is no integrated coastal system for recording data on fisheries' violations. When the striped bass fishery was opened several years ago, we compiled a striped bass enforcement sheet; and after I talked with members of the technical committee at that time, for some time it provided no useful data that could be translated into catch mortality rates because they were subjective.

Everytime you change a fishing rule, everytime a year class comes in and it's predominant, the variables change in violation rates. The best guess at this time is that fishing violation rates on striped bass are constant throughout the range. There is a significant illegal fishery on large fish off the mouth of the Chesapeake Bay, and they are definitely in the hundreds of thousands of pounds. Some of those fish are being counted.

CHAIRMAN TRAVELSTEAD: Just as a followup to Mike's comments, the problem off the coast of Virginia and I think similarly off North Carolina is becoming a perennial problem that is not responsive to the issuance of summonses. Summonses are being written off Virginia's shores for boats illegally fishing in the EEZ every week, and yet the activity continues to occur.

I think partly it is due to fact that the fines for those violations are not very severe. Folks are very hard to catch. On top of that, our Law Enforcement Division that is about 60 officers in the field is down by 22 positions as a result of some of the budget cuts we've had in the state recently.

I think the only step that's left to Virginia to help solve this problem is some type of permit sanction. All of these vessels, when they're fishing legally, have to have permits from the agency, not to fish in the EEZ, obviously, but to participate in the charterboat fishery in Virginia, and we will be pursuing at least looking at those types of sanctions, but beyond that I'm not very optimistic that anything else will have much of an effect. Any other comments on Task 4?

MR. G. RITCHIE WHITE: We have had these same issues up in New Hampshire and off the Massachusetts coast as well. I don't think to the same degree, but we still have those issues. I know the coast guard has taken a fairly active role up our way, and maybe the board or the commission could write to the coast guard and ask for their assistance in this issue because they certainly have the ability or have the structure to be out there checking these boats.

MR. HOWARD: The coast guard is an active participant and a team player and coordinated efforts are occurring in the area.

CHAIRMAN TRAVELSTEAD: I can't speak to how active the coast guard is off Virginia, but my thinking is they're doing what they can with what they have. We certainly work with them quite a bit on their vessels. Vince.

EXECUTIVE DIRECTOR O'SHEA: Of course, you just talked about two issues. One is you first addressed, what do you do after you catch somebody, and you're beginning to think that what we're doing is not enough to serve as a deterrent. Then the second issue that Ritchie is bringing up is what more could be done to catch people. It would seem to me that maybe increasing the sanctions and going that way would probably be the first step. I mean, anecdotally, folks tell me if a couple people lost their licenses, that would get people's attention pretty quickly. Thanks.

CHAIRMAN TRAVELSTEAD: And we intend to move in that direction. Bill.

MR. GLDSBOROUGH: On that point, Jack, would loss of license or permit, as you said, affect the average recreational angler or is that just a charter measure?

CHAIRMAN TRAVELSTEAD: It could be both. Yes, it could affect an individual angler, sure.

MR. GOLDSBOROUGH: Another point. It sounds to me like this is substantial enough take that's not being counted that we ought to look into – well, we ought to at least be more conservative in an attempt to keep in mind that there is a significant uncounted catch. I guess to underscore that point, can somebody say – perhaps Wilson – whether or not the last stock assessment included any even hypothetical counts found illegal catch?

DR. LANEY: Nichola and I do not believe that we did include anything for poaching.

MR. DIODATI: I guess based on Mike Howard's comments that the magnitude of this is large, hundreds of thousands of pounds, and a good portion of it is going unreported, I'm also very concerned about Mr. O'Brien's request to the commission to do something about this. Mr. O'Brien has been a known entity at these commission meetings for a number of years now, and I know historically he has been a strong proponent of liberalizing the striped bass fishery.

To hear him come forward and express that level of concern is a signal to me that we've got a fishery out of control. I don't want to be sitting here two years from now finding out that the spawning stock biomass has degenerated to the point where we don't have much hope but to close fisheries in order to recover the stock or the fishery.

I appreciate that taking some kind of permit sanction is probably the way to go, but I also recognize that the commission doesn't have any authority over these permits, whether they're individual state permits or federal coast guard certifications, so I'm not clear at all on what action that we can take that would be swift and effective to get this under control.

I'm wondering if the real problem is that because the EEZ is closed are we miscounting these fish because the EEZ is closed and do we have to reopen the EEZ in order to shut down the fishery? I mean, that doesn't sound correct to me, but are we in jeopardy here of not managing this fishery properly because of the closure? I think we have to do things swiftly here. Otherwise, we're going to find ourselves in a very, very bad situation. I don't see how we get a permit sanction in place through this body.

DR. LANEY: Well, just one point to Bill Goldsborough's point is that by not including poaching in some respects, that is a more conservative approach since if you include it, then the model responds by increasing your recruitment and your SSB. Remember what I said about the simulation approach we used, it's overly simplistic because it assumes that constant rate of poaching across all age classes.

I think Paul's point is a very valid one here when you consider that winter fishery is being prosecuted on fish that are, in all likelihood, disproportionately older than the rest of the stock. If that is in fact what is occurring and we actually had some numbers and could plug those into the stock assessment model, my perception is that we might get different results. I'm not sure since I'm certainly no expert on that point.

CHAIRMAN TRAVELSTEAD: Any further comments on this? Tom.

MR. THOMAS O'CONNELL: Yes, Jack, I'll try to keep it brief. Obviously, this is an intercept fishery that is highly raised in our discussions back home, particularly when we are proposing regulations to reduce the catch-and-release fishery and making comments that we have to further evaluate our spring fishery, recognizing some of the harvest estimates from last year. I'm just concerned about a year ago in May the technical committee came to us and said that our best estimate is that this winter intercept fishery is 200,000 to 800,000 pounds; and whether it is the 200 or 800, it is of significance that we should get a better handle on the actual estimates.

We're fortunate to have some ACCSP funding being brought to the table, but it is my understanding that contractual mechanisms weren't put in place in time to really get estimates from Wave 1 this year; and because of the reduced funding, it is likely it is only going to be part of pilot program when it does get started.

I'm hearing from the technical committee that this is a significant issue. My sense is that we're probably not going to have an accurate estimate for years ahead of us; and I think given the importance of this, we should be looking at swifter action to get a better understanding of what is going off the intercept fishery. Thanks.

CHAIRMAN TRAVELSTEAD: I just want to clarify that the technical committee is tasked with working with the Law Enforcement Committee to put this workshop together and report back to us in May. Paul.

MR. DIODATI: I apologize I'm not as familiar with the timing of this winter fishery as I should be, but I think that there is probably certain months of the year

where more critical damage could be done, if you want to call it that, or illegal fishing could occur at a higher rate. What we could do very quickly is to create a situation to prevent any harvest during those months regardless of where it occurs.

What you end up doing is having a catch/release fishery only during these winter months. What I don't know is can you target particular months that would be effective in curtailing this kind of illegal fishing while still allowing good months of harvestable fishing in your waters?

CHAIRMAN TRAVELSTEAD: I'm not sure that would be possible. Virginia's legal fishery is typically December through February at the mouth of the bay, in state waters, and then further south down into North Carolina as the season progresses. What is happening this year is the water temperature is so cold that there are no fish in state waters that generally support a nice legal fishery.

Those fish are now 15 to 20 miles offshore; and so while you have some poaching activity going on in the EEZ, you don't have a legal fishery on top of that. Pounds that otherwise would have been landed legally are now being taken illegally; not both happening at the same time. Tom.

MR. THOMAS FOTE: It wouldn't be fair to North Carolina because that's the only time they see a fishery down there is in those months; and if we close it down there, they wouldn't have really a striped bass fishery, so I can understand that we can't do something like that, but it is a serious situation and we really need to deal with it.

I mean, if you just look at the catch and the message boards and what is going on, you know, I have been e-mailed all those 50 pounders coming in and being weighed in. You know, in the old days at least in New Jersey when they went out there, I basically reminded people you're illegally fishing so they wouldn't put it in the newspaper, but I guess those guys don't care, because they put it all over the message boards and they weigh in and take all the pictures and you know where it's coming from.

I guess it is flaunting the law. I don't think because it is an legal fishery, you know, that would be like saying Maryland had that legal fishery going on, that we should feel a way of accommodating that legal fishery because it was illegal. We shouldn't be doing it with the EEZ. We need for that to stop and make stronger penalties, federal penalties.

I mean, you wouldn't go out and catch bluefin tuna because you know the federal penalty for bluefin tuna, if you get caught in the EEZ, is huge. That makes people second thoughts, and that's even starting to happen now, but when you just get slapped on the wrist it happens more often.

CHAIRMAN TRAVELSTEAD: Well, to that end would the board be interested in sending a letter to the service asking for stronger penalties for violations of this? Seeing everybody's head going up and down, then we'll do that and ask the staff to prepare a letter along those lines. Yes.

MR. MIKE JOHNSON: I want to speak to Paul's first point. The point I vehemently disagree with. Shutting the fishery down would ruin us. To sound like a broken record, if in fact the EEZ was opened and if in fact the people fishing on the fish were permitted, we could then in turn count the fish and we could manage the fishery to the best of our ability.

This mystery illegal fishery will never go away if we can't count the fish. They're going to go catch them. I don't know how flagrant it is. I trust Mike. I do know and I can tell you this, that on a beautiful day out of Oregon Inlet the coast guard watches the weather and you can see a C-130, you can see a helicopter, you can see a cutter, you can see a 33 or you can see semi-rigid, if you want to run drugs that day in some other port, it's a great day, because all the resources are over Oregon Inlet, everything there is.

It is a terrible waste of resources, but the problem is caused by that three-mile line. Until we work to change that and permit people so we can count fish, this discussion is going to go on because guys are going to be guys and they're going fishing, and some of them don't care what we charge them.

CHAIRMAN TRAVELSTEAD: Okay, just to summarize we're going to send a letter to the service asking for stiffer penalties, we going to ask the law enforcement and technical committees to proceed with their workshop and report back at the spring meeting. I would think by the spring Virginia could also report back on the results of any permit sanctions that might have occurred in that time period. Anything else on this issue? Okay, let's move to the last task, distribution shifts, any comments on this issue? Tom.

MR. FOTE: I'm not throwing out a new task for the technical committee because I've realized when we keep throwing tasks out to the technical committee,

there are so many technical committees that we're over-tasking our people in the states to do a lot of jobs, but it's interesting when we started striped bass and we started the recovery and we started looking at the stock, at that point in time, when we opened the fishery, the Delaware River had a very small contribution to the coast. It was really a rebuilding fishery because we finally had the sewer plants corrected in Philadelphia.

We just got rid of the oxygen block, and now we have a real healthy fishery. I think it's time at some point, when we have the resources, to look at what the contribution of the Delaware stocks, because my fear is that the Chesapeake Bay stock is a lot more in serious difficulties than we realize; and because of the great increase in the Delaware stock, that is basically covering up a lot of the faults.

Because 20 years ago, you know, all we had to look at was 25 years ago, there was no fish in the Delaware River. There was not these stocks. You had a few carry over from the canal, but if you looked at what was going on there 20 years ago – I mean, I went down and talked to the Delaware fishermen and they says weakfish, weakfish, we don't care about striped bass.

Nowadays they make – the charterboats down there make their living on striped bass. We really need to take a look at some point of what that contribution is to the overall stock because we used, what, the old 15 percent or 25 percent, I'm not sure, when we combined the Hudson and the Delaware. I'm not asking it for now because there are too many tasks but sooner or later we need to get the money to do the tagging studies to basically find out what is the contribution of all three areas are to the stock.

PRESENTATION ON MYCOBACTERIOSIS

CHAIRMAN TRAVELSTEAD: Any other comments? All right, are we ready to move on? We have three experts with us today on mycobacteriosis. This is an informational item. The board requested a review of this issue. I think we're going to learn a lot. Did you have anything, Nichola, in advance? Who wants to go first? Yes, Bill.

MR. GOLDSBOROUGH: Jack, did you cover Task 5, the distribution shifts?

CHAIRMAN TRAVELSTEAD: That's what we just did.

MR. GOLDSBOROUGH: Oh, we did?

CHAIRMAN TRAVELSTEAD: Yes, do you have a comment? Okay, David.

DR. DAVID GAUTHIER: My name is Dave Gauthier. I'm from Old Dominion University. I was asked to come here and talk to you today along with some of my colleagues from VIMS and Maryland DNR about the situation with Mycobacteriosis in striped bass in the Chesapeake Bay. I would also like to acknowledge my co-authors on this particular study, Drs. Latour, Bonzek, and Vogelbein from the Virginia Institute of Marine Science.

Just as a very brief background, Mycobacteriosis in fishes is caused by a bacterium in the genus Mycobacterium; the same genus that causes human disease like tuberculosis and leprosy; not the same bacterium but related. It affects over 160 species of fishes, probably much more than this. Traditionally it is thought to have been – this disease has thought to have been caused by one of three agents, M. marinum and M. fortuitum or M. cheloneae.

But when we start looking for those agents in Chesapeake Bay striped bass, we didn't find them. Instead what we found – actually, I'm sorry, let me hold on that for one second and back up a little bit. Disease presentation is variable, depending on the host and the infected species. It is generally a chronic disease taking several months to years to kill its host and is characterized by inflammation in affected tissues.

It can either cause morbidity or mortality, depending on your system. Many of us who have fished striped bass have seen these types of lesions, especially in the Chesapeake Bay. On the top we have our dermal lesions, which is essentially this hemorrhagic condition of the skin. It makes fish very unattractive.

More commonly what we see is visceral lesions, which primarily affects the spleen and anterior kidney of the fish and can cause significant destruction of internal organs. In the bottom picture, the nice maroon organ you see is the spleen and the gray nodules in the spleen are caused by a moderate to severe infection with mycobacteria.

Getting back to the agents which cause this disease, we have seen very high disease prevalence; over 70 percent in some portions of the stock; over 30 percent prevalence rates of dermal disease. Instead of our typical big three mycobacteria that we've seen in the past – and that's described in the literature – what we

appear to have are the two big players, a brand new species to science. We've named them M. shottsii and M. pseudoshottsii.

Then we also have a whole suite of additional mycobacteria that don't belong to named species, so the majority of these mycobacteria are basically new undescribed species, so we have a very complex etiologic or disease agent situations in bay fish. We can also get multiple islets from individual fish, which further complicates the analysis.

Why do we need to be concerned and why do we need to monitor this disease? Mycobacterial disease is present at high levels in Chesapeake Bay. I mentioned 70 percent earlier. In some age classes in the study, which I'll be talking to you about today, we see over 90 percent prevalence of the disease in internal organs.

As many of you I'm sure are aware, recent research modeling of tag-and-return studies has indicated or is supportive that there is an increase in natural mortality since 1999, which Mycobacteriosis may have something to do with. Essentially right now the disease component of this natural mortality is unknown.

Prior to the studies that I'll be talking to you today, there have been other studies done, but this is really the first large-scale study throughout the Chesapeake Bay that I'll be talking about. When we're asked to provide information about whether the disease situation is getting better or worse in the bay, prior to when we performed this study it was largely anecdotal, and there was a lot of guesswork involved.

For our disease monitoring program, one avenue we're pursuing is we're using the ChesMMAP Survey, Chesapeake Bay Multispecies Monitoring and Assessment Program, operating out of VIMS. This is a large-scale trawl survey which samples adult finfishes throughout the bay five times a year, and it also happens to be a very good platform for looking at disease prevalence throughout the bay.

This is a collaboration we have established with ChesMMAP, and it is essentially a value-added component of the ChesMMAP Program. The data I'll be presenting today is 2003-2005 data, and we're still working on the next three-year data set, getting that information together. This is essentially what the disease prevalence looks like separated by age and sex of fish with males in blue and females in pink. Essentially you can see that disease prevalence increases steadily with age up until about age five, reaching very high levels in both males and females; and then we see a consistent pattern where males stay high and females drop considerably to lower prevalence levels. A couple of other things to notice is that we do see disease in age one fish in Chesapeake Bay, which means they are contracting the disease in bay waters.

Also, when we talk about disease, I get asked the question frequently what is the prevalence? Well, it's complicated because it's highly dependent on the age and the sex of the fish. Down at the bottom I have does the disease cause mortality, which is really the $64,000 question that we get asked repeatedly, and we have a couple of lines of research in which we're trying to address this question.

The first approach, which I'm primarily involved in, is a mathematical modeling approach using prevalence data from the ChesMMAP Survey. I won't go into a huge amount of detail on this, but essentially this modeling approach – I like to describe these epidemiological models as "common sense with a system".

Essentially what we have is we specify three different compartments in which an animal can reside, either alive and disease-negative at time T; alive and disease-positive at time T; or dead and age of that fish would be T. Then we specify rates of transition between these compartments, so essentially infection of fishes, the rates of infection of fishes, and rates of death of fishes, both death of diseases-positive and death of disease-negative fishes.

Then we put the whole model together, and this is basically what the model looks like. When you put it together, we have the three different compartments which contain the different categories of fish and arrows leading from one to the other. You don't really need to worry about the formula up in the upper right-hand corner. It essentially just describes the model.

One of the innovations of this model is that it can be used to describe this three-state disease system with the inclusion of a term in there, which is the Greek letter Mu, which is a term describing potential disease-associated mortality of fishes in the system. Basically, what this model is built to describe – again, don't worry about the math on the bottom, but if we look at what is called cumulative incidence or the amount of disease we would expect to see in a population over time, as more and more fish become infected, we would expect to see climbing prevalence of disease as age increases until we have essentially

more or less all of the fish infected, and that's what you can see with this climbing magenta line up there.

Now, what happens if we have disease-associated mortality in the population, it's kind of a common sense thing that if fish are dying because they're diseased, when we take a snapshot look at the population through a trawl survey at a given point in time, if there is disease-associated mortality and some of those disease-positive fish have dropped out of the population, we're essentially going to bias our sample toward disease-negative fish, and that's going to artificially lower our observed prevalence.

The lines below that magenta line at the top are different levels of disease-associated mortality and the kinds of observed prevalence we'd expect to see in the system under different mortality regimes. Essentially the model is designed so that we fit the data to the model and we see which of these curves best describes the data that we observe.

Without going through all the model and the data analysis that goes along with it, I'll just give you the take-home messages from the work we've done so far. We do see force-of-infection or the rate at which animals become disease-positive is age-dependent and does appear to have a peak early on in life in ages one through three.

We do see significant effects of both sexes of fish and time of year on the force-of-infection, and it does appear that it's fairly striking that the force-of-infection does increase as the year goes on. We're not quite sure of the implications of this yet, but it is an interesting pattern that we're interested in looking at more in the future.

The main takeaway from this model is if we look at this Mu term, which essentially can be thought of as the probability of a diseased fish surviving a year versus a non-diseased fish surviving a year, what we see is that the existence of the disease-associated mortality is supported by these models with a relative survival of diseased fish of about 0.69 relative to non-diseased fish.

It is difficult to measure chronic mortality in a wild finfish population. If you have an acute mortality event, very often what you'll see is millions of fish washing up on a shoreline somewhere; whereas, if you have chronic mortality and they're dropping one by one, they essentially drop out and you never observe these fish, so these modeling approaches are one way that we look at whether disease-associated mortality is occurring.

For future directions of how we're researching this disease – and my colleague Matt Smith from Virginia Institute of Marine Science will be talking to you next about the top item, the tag-and-release studies in the Rappahannock River where we actually tag and release diseased versus non-diseased fish and look at return rates over time.

This is a complementary line of evidence to the whole question of disease-associated mortality and is actually a more direct measure of whether the disease is actually killing fish or not. The second item is basically we're using models to generate hypotheses about the disease. Especially with the first go at the model like we've done here, models are never perfect. There is a saying about models, all models are wrong, some are useful.

We feel we have a useful model right now and that it has shown us really that we need to be focusing on what is going on in these older female fish. In terms of what effects the disease is actually having on the population in terms of absolute numbers, that's a little bit more complicated process, and it's one that really hasn't been done.

It is kind of a novel approach incorporating disease studies into population dynamics studies, and this is one approach that we're starting to explore in our laboratory. I would just like to very briefly acknowledge the lab of my collaborator, Dr. Vogelbein; also, the PI's on the ChesMMAP Survey, Drs. Latour and Bonzek and Jim Gartland; and also the lab of Dr. John Hoenig, of which my colleague Matt Smith is a part. So with that, I will turn it over to Matt.

MR. MATT SMITH: Like Dave said, our labs worked pretty closely together on this tagging project in an attempt to estimate the relative and absolute survival rates of striped bass in a more direct manner. We also worked closely with our colleagues from Maryland, of which Mark Matsche is up here at the table and will speak later on.

Today I'm going to present to you some tentative results on relative survival as well as progression of the disease, how long it takes to advance from the earliest signs to a moderate sign to a more severe sign of disease. Other things that we're going to look at are patterns in movement, potential differences between really sick fish and healthy fish, how they move around the bay that we can get from tag returns and also some effects on growth, but those aren't really specifically related to the management issues,

so I'm going to stick to the survival in the time that I have.

Just to inform you on the different categories you're going to see as we through the analysis, a clean fish that comes on the boat and has no visible external signs of the disease is labeled at a Condition Zero fish, and it's just a healthy perfect-looking striped bass. Earliest signs of the disease, if you're not trained to really see this, you can easily miss it. It can look like a spine from another fish that may have stuck the animal. They're also very small.

I don't know if you can see it, but there are arrows there pointing to the earliest signs of the disease, which are called pigmented foci. They're very small ulcers that form on the skin. This is what we consider a Condition 1 fish are the lightest sign of disease, the first signs that we can see. As the disease advances – and that slide is not showing up very well – pigmented foci can continue to appear on the animal.

They come more numerous on both sides of the fish. It can also develop sort of these large ulcerous lesions that Dave had shown in some of his slides on the anima, and we'll see a beautiful one on the next slide of the worse conditioned fish. In the belly of that fish you can see a large ulcerative lesion that forms. This is what we consider to be the worse-case scenario of an animal. We're observing them externally.

That type of fish is in pretty bad condition typically, often emaciated and malnourished and it's in poor condition when it comes on the boat. To estimate survival we use a logistic regression model, but it basically boils down to looking at the survival of a diseased fish relative to the survival of a clean fish.

If we had a clean fish, that Condition Zero, healthy bass, they had an annual survival rate of 0.5; and a diseased fish, a Condition 3, had an annual survival rate of 0.25, we'll get an estimate of the relative survival, which will be half. The sick fish are surviving half as well as a clean fish. As of right now, we're not getting estimates of absolute survival rates, but we will be getting those soon.

Our tag numbers or return numbers have to increase a little bit more and we will have the data to actually start getting estimates of absolute survival by those condition classes that I laid out. Before I show you the results, I just want to state a couple of points here. This is applicable to resident Chesapeake Bay fish.

Our studies were conducted in the bay on younger age class animals, and the results that I'm going to present shouldn't be extended beyond the bay at this time. We don't have any evidence to support the assumption that this is taking place in the migratory stock or in other stocks outside of the bay. Maryland's data is smaller, the program hasn't been going on as long and they haven't accumulated as many returns as Virginia has, and I was unable to do a stand-alone analysis on their data.

I'm going to present a Virginia-only data and then combined data as sort of a contrast of two different regions of the bay. The Virginia-only results, basically the estimates that we're receiving right now, the top box is heavy versus clean, those Condition 3 versus the healthy fish, the far right box is the estimate of relative survival

Like I alluded to earlier, we estimated relative survival of about 50 percent for those fish that were released in worse condition, so they're surviving half as well as a clean fish. The box directly below that, which is an estimate of about 60 percent, is for those fish in Condition 2, so our moderate class, or what we deem to be moderate, is not a whole lot better than the severe class.

They're starting to see significant – and these are significant results statistically – significant levels of increased mortality by the time they've reached that moderate condition. What you can't see on the screen below that, the estimate for light versus clean was 80 percent, and that is not significant result. As you might expect, the animals that are in that first sign of the disease, that doesn't look very bad, they still look healthy, are surviving as well as the fish that is released clean.

When we went and combined the data with Virginia and Maryland, what you may have noticed is that the estimate for a Condition 3 remains pretty stable, and the estimate of relative survival for the Condition 2 fish increased by quite a bit. I found this really interesting when I was doing the analysis because to me it sort of suggests that there may be some regional differences in how the animals are able to cope with disease between different parts of the bay, but at the same time those results may be different.

The Condition 3 is very similar, and again a significant result. The Condition 2 estimate is slightly higher, that they're surviving a little bit better than it appears with the Virginia-only data, and it is nearly a significant result, but both still show

increased mortality in striped bass at that level of disease.

So, sort of a take-home implication, of the over 15,000 fish that our two agencies have released, the numbers you see in percentages are what we released and matched. When we recorded their condition on the vessel, about 36 percent were clean, 37 were in that Condition 1, 15 in two, and 11 in Condition 3, so there is about 25 percent of those Condition 2 and Condition 3 fish that we see on our tagging programs in the Chesapeake Bay that are experiencing significantly elevated levels of natural mortality as a result of Mycobacteriosis.

The final thing – and I'm going to touch on this briefly – is estimates of progression, so it is curious to know the fish we released in Condition 1 are not experiencing severe elevations in mortality from our estimation. Well, how long does it take them to advance from the condition to one of those conditions that does seem to be experiencing elevated mortality?

In order to do this we had to get the fish back and we had pretty cooperation with our anglers. They returned a lot of fish whole on ice to our lab to be looked at again and reassessed and determine whether or not they have gone from our Condition 1 or our Condition 2 class to one of those higher classes, 3 or 2, where they're going to experience a more significant level of mortality.

The results of that study basically show that it takes about three years, on average, for a striped bass to advance from the first sign of disease to a Condition 3 stage and about a year and a half for each stage, so from Condition 1 to 2, about a year and a half; from 2 to 3 about a year and a half.

The conclusions and kind of take-home messages of this study are basically that we believe it takes approximately three years for an animal to progress from where we first can identify the disease in the field to Condition 3; at which time we're estimating right now the resident Chesapeake striped bass in Condition 3 is experiencing nearly double the mortality rate of a clean fish.

Average prevalence in the tributaries, where we're doing our study of all condition classes, the 1, 2 and 3 combined, it is an prevalence across sexes and across years, is 53 percent in the Maryland data and nearly 70 percent in the Virginia data. Of those, the fish that were released clean, approximately 90 percent of those fish, when we get them back, are disease-positive within six months and 100 percent are disease-positive within a year.

There seems to a very high incidence rate of disease in the areas where our study is taking place. A lot of people were involved in this study, a lot of funding agencies. I will let you read through them real quick, but this kind of research is funded by people who are concerned, and we appreciate their support. Thank you very much.

MR. MARK MATSCHE: My portion of the presentation will cover information on the state of Mycobacteriosis in striped bass outside of Chesapeake Bay. What we know from multiple previous studies so far is that disease prevalence is very high in Chesapeake striped bass and has been persistent for a number of years, at least since 1998.

The migratory nature of striped bass really opens the possibility for disease transmission to other systems, and this raises a number of questions such as, first of all, what is the prevalence of this disease in the coastal migratory stock, is this disease found in other coastal systems outside the Chesapeake Bay; and if so, are the same species of bacteria involved?

To address the first question of the coastal prevalence of disease in the coastal migratory population, Maryland DNR and a number of partners conducted a study back in 2005 and 2006 to look at disease in this population using the recreational angler survey. In the survey we had a chance to briefly examine fish as they came off the boats and collect spleens for tissue analysis.

From the tissue analysis, what we did is we looked at using histology, we looked for the characteristic lesions containing bacteria that are characteristic for this disease. This survey collected two different sets of tissue samples. The first set of samples was collected at the Oregon Inlet Fishing Center. This was done in December of 2005 to February of 2006.

A second set of tissues was collected in Tillman Island, in Maryland's portion of Chesapeake Bay, and this was done in May of 2006. Based on an analysis of the splenic tissue, we found that disease prevalence in these groups of fishes were actually very low. Prevalence was just over 5 percent in the North Carolina samples and just over 8 percent in the Chesapeake Bay samples, although these results weren't statistically significant, so overall our disease prevalence estimate was just under 7 percent.

Then we looked at disease prevalence by gender and by location. We know from information that Dr. Gauthier presented earlier that these increases by age and there are differences found in sex. From our samples we looked at this and we found that disease prevalence was slightly higher in males compared to females, although these results were not significantly significant.

Then a second thing we were able to do with these spleens was we looked at another possible source of stress that might act on these fish, and that was the presence of parasites. We looked at parasite prevalence. These are parasites that embed themselves in the splenic tissue. We looked at both prevalence and intensity of parasites, and we found that they were fairly low overall and they had no significant effect on disease prevalence of Mycobacteriosis.

When we looked at the spleens we found that in all these fish the severity of the Mycobacterial lesions was mild. This is in contrast to younger Chesapeake Bay fish where you see a range of severities of these lesions. Anywhere from mild to very severe were virtually impaired spleens affected.

Then statistically we looked at this group of data and we did not detect any differences by location or by gender. We also found that the size of the fish had no effect on prevalence. However, with such low prevalence our sample size was relatively small so I think additional sampling is definitely warranted.

After this we did some PCR work and some gene sequencing. We did this from the fixed tissue samples to both verify the results of our histopathology and also to identify the Mycobacterial species that may be present. Of the two main players, the two species that are commonly isolated from the smaller Chesapeake Bay fish, M. shottsii and pseudoshottsii, these were not detected in our samples.

In fact, all of our sequences came back as unknown species. As Dr. Gauthier mentioned earlier, this is actually not that uncommon doing either culture work or PCR detection work in Chesapeake Bay fish. Then there has been a handful of other studies that looked at this disease in other coastal systems besides the Chesapeake.

Back in 2003 a group from USGS looked at striped bass in Delaware Bay; and from these samples, they found that disease prevalence was about 18 percent and that they detect an M. shottsii-like isolate. Striped bass were also examined from the Roanoke River and Albemarle Sound from samples collected in ’03 and ’06, and again disease prevalence was about 18 percent, and M. shottsii was recovered from these fish or some of these fish.

Finally, there is a study that is currently underway up in the Hudson River by a group from SUNY Stony Brook, and they’re looking at some striped bass. Their occurrence estimates of disease prevalence are either similar or even slightly lower than what we’ve seen in the Delaware and North Carolina fish, and M. shottsii and pseudoshottsii were both detected from these fish.

What we’ve seen now is just really a handful of studies that have looked at this disease outside the Chesapeake, and this really just gives us a glimpse or a snapshot of disease condition or prevalence in fish outside, and it really raises a number of questions, probably more so than providing answers.

We’ve seen a significant decrease in disease prevalence in the migratory stock, and this raises questions of whether or not there is healing that is occurring or whether or not there is significant disease-related mortality, which is something that my two colleagues have mentioned earlier. We also see that this disease is present in other coastal systems including the Roanoke, the Hudson and the Delaware, and this brings up the issue of whether or not there has been transmission of this disease to these systems or if there is an isolated outbreak.

The significantly or the dramatically lower prevalence that we have seen outside the Chesapeake may point to the fact there may be unique stressors found in the Chesapeake Bay that are acting to increase disease susceptibility in these fish. Then, finally, we need to mention that there may be issues of disease dynamics going on. We don’t really have a good grasp on that right now, but this disease may simply operate differently in fish of different life stages or habitats. That’s all I have. Thank you.

CHAIRMAN TRAVELSTEAD: Okay, thank you all for your very thorough reports. I think it is very interesting and very helpful to the board. We probably have a number of questions. Bill.

MR. WILLIAM A. ADLER: First of all, I was wondering if you’ve looked into any of the causes that could be attributing to this. Also, is this dangerous to the public if they take the fish there – I suppose they try to eat it or something like that. The last question is it only seemed to be in striped bass or

are there other fish in the area that have contracted this as well?

DR. GAUTHIER: I guess I'll take your questions in order. In terms of the causes of the disease, a very, very good question, basically Mycobacteriosis is fairly common around the world, especially in aquaculture situations, and what happens is that it will be present in the environment and the fish will carry it, and they won't show disease outbreaks until you stress them.

You know, you pack too many fish in a tank, the water quality goes down, something like that, and then they'll break with disease and it can be very severe. One of the dominant I guess modes of thinking on this is that there is some sort of – as Mark said, there may be unique stressors inside Chesapeake Bay that may be contributing to this disease.

Very briefly, a couple of possibilities that have been presented are that striped bass are not getting enough forage fish which is causing nutritional problems which may lead to disease. Another possibility is the so-called thermal oxygen squeeze hypothesis where basically it is thought that resident striped bass in Chesapeake Bay, the ones that aren't migrating outside of the bay, may use deeper waters of the bay during the summertime as a cool water effusion from the very warm surface waters, but with the growing problem of anoxia and bottom water layers and dead zones in the lower water layers they may be being forced out in the suboptimal shallow hot water.

As of right now all of these things are just hypotheses. They're difficult to study, but right now we're looking at ways of either trying to study that directly or to at least model these systems so that we can look at the effects of differing temperature on disease progression and things like that. In terms of the danger to the public, one of the Mycobacteria that causes this disease, Mycobacterium marinum, can infect people. Generally, it can only get in through open cuts or abrasions on your hands, and it will generally set up a self-limiting inflammatory reaction.

It can't survive at core body temperature, so it doesn't get into internal organs in general or anything like that. In rare cases, especially with immuno-compromised individuals, the disease can be fairly severe on the extremities, hands, feet, legs, arms, et cetera, and in some cases can require long-term antibiotic therapy and/or surgical removal of granulomatous inflammation.

That is uncommon. As far as shottsii and pseudoshottsii, they don't tend to like temperatures over 30 degrees Celsius, so that's one indication that we have that they may not be so much of a zoonotic problem, but the bottom line is we do not know if those are a zoonotic because we're not looking for them in people yet.

As far as recommendations to the public, essentially what we have been recommending is just common sense measures. If you have open cuts on your hands, wear gloves when you're cleaning a fish, these sort of things; much the same kind of recommendations that anybody would give to people that are cleaning deer or rabbit carcasses after hunting. It's just basically use basic barrier measures to protect yourself. Then as far as the last question, I'll pass this over to Mark.

MR. MATSCHE: I can address that question. Maryland DNR and several partners, including the University of Maryland and NOAA NCOS, have done several surveys, unpublished surveys. We've looked for Mycobacterium in other fish in the Chesapeake Bay. This really raises the question of sort of a difficult concept to grasp a little bit, anyway, and that's infection versus overt signs of disease.

What we've found is – well, we've known going into this that Mycobacterium tends to be ubiquitous around the world. It is found in a lot of different systems. More than 160 species are susceptible to it. When we went out into the bay and we actually started looking for Mycobacterium in a wide variety of fish, we started finding it, but what we're finding, though, is we're finding bacteria that reside within the fish without causing overt signs of disease, so we call that infection.

So if we go in and we take fish samples and we culture them to identify the bacteria or other organisms that reside on that fish and we find Mycobacterium, we find it at fairly high rates. We found it in at least about eight or nine different species of fish within the bay that we've looked for it.

What we're not seeing, however, is overt signs of disease on a large scale in other species of fish in the bay, so the lesions that you saw on some of the images from Dr. Gauthier, we don't see that on white perch, we don't see that on croaker and other species of fish. It is out there and what we also know from other NOAA NCOS surveys is that it's in the environment, so it is at least in water samples and it is also on fish. It is out there but in terms of causing

disease, right now it seems to be only a problem in striped bass.

REPRESENTATIVE SARAH PEAKE: Two questions, and, Matt, I think they're directed towards you because they arose out of your presentation. You talked about tagging resident fish, so the first question is how do you know it's a resident fish versus a migratory fish; and then, secondly, right at the end – I think it was the last slide – did I hear you correctly when you said that almost a hundred percent of the clean fish that you tagged, within two years they showed signs of the disease?

MR. SMITH: The last question, real quick, was within one year of the time of release, when we get those fish back, a hundred percent of them are disease-positive externally based on the criteria that we used to assess them at the time release. Then those fish, it's important to note, like Mark was saying earlier to answer the last question, they may be infected with the bacteria when we see them and label them as clean because they're not yet expressing the overt signs of the disease, so we've got to assume that some of those fish – we don't have to but we do assume that some of those fish are truly clean at the time of the tagging if they're infected yet, so obviously not expressing the signs of the disease, and yet we haven't gotten tags back beyond a year where those fish are not being reassessed as being disease-positive at the time of reassessment.

Then full disclosure, there is also concern that the process of tagging the fish may introduce the bacteria to them because we are surgically implanting these tags. They're also being held in pound nets where the animals are in close proximity to each other before we receive them on the vessel. That is a concern and we're trying to think of ways to actually test that and see how much of the incidence rate we're witnessing could be an artifact of the study itself or how much of that is actually a true incidence rate.

I think it is unreasonable to assume that a hundred percent of what we're seeing there is caused by the study. I think there is a large incidence of new disease occurring in the population, but that is something I wanted to mention just to be honest about it.

REPRESENTATIVE PEAKE: Do you think you might get a lower return rate of tagged clean fish? In other words, the fishermen might be keeping those to take home as opposed to sending it back, but if it looks diseased it's like, yuck, who wants to think about this for dinner.

MR. SMITH: Potentially. We don't rely solely on the fish being returned whole to us. The estimation of mortality is done using simple call-backs with tag numbers. The person who calls back that tag number is under no obligation to give us the fish by any means. We have sort of informally polled people during the interview where they call back with a number.

If we can get in touch with them, we ask them whether or not they're aware of the program, if there is anything that influenced their decision to return the call, and we haven't found any evidence to support that people are returning tags differentially based on the condition of the fish when they catch it.

For your first question, which was with the resident fish, they're not wearing a badge or a name tag saying they're resident fish, but we're basing that off of the age composition. We're mostly tagging young animals, and we also have tagging programs that occur in the fall where a large portion of the fish are assumed to be resident.

We do have some larger animals, some which could be from the migratory stock, especially ones that are encountered in the springtime, but they're a small contingent of the overall study. It is mostly age four, five and six fish and mostly that we capture in the fall.

DR. EUGENE KRAY: This may be a difficult question to answer, and it may even be stupid, but is it possible or is there any evidence that a female spawning striped bass could infect the eggs that it's laying?

MR. MATSCHE: Yes, several years ago there was a study that was headed by NOAA NCOS where a number of spawning females and males, actually, were captured on the Nanticoke and the Chop Tank River in the Chesapeake, and we actually extracted gametes, eggs and milt to see if we could look for Mycobacterium.

I believe some of the samples came back as positive, so it was there, but that still doesn't necessarily mean that it can be then transmitted to the fry and then up the stages. We know it's there in the fish and we know it's there within the gametes themselves, but beyond that we can't say.

MR. LEROY YOUNG: This is just an observation. The Susquehanna River, which is the major tributary of the Chesapeake, we've been, in Pennsylvania, observing bacterial disease problems, columnaris on small-mouth bass young of the year for a number of years now. We had never seen it before about 2005, and we had a study done by the USGS the last two years in which we documented that it's during the – the young small-mouth bass live in two feet of water in the micro-habitats nearshore.

During periods when – in one year the study was done water level flows were relatively low, temperatures were relatively high, dissolved oxygen levels were relatively low, under five down into the fours sometimes in those micro-habitats, and we had a high incidence of disease throughout the basin.

Last year, when the study was done, we had relatively high flows and almost no disease; relatively high dissolved oxygen and so forth, so it is interesting and it just makes you wonder if there is correlation between the kinds of things we're seeing in the Susquehanna and what you're observing in the Chesapeake.

We also know that through additional work that is being done by USGS that endocrine disrupters are pretty high prevalence in the Susquehanna and much higher than in the Delaware and the Ohio, the other two major basins in Pennsylvania, and the incident of – I'm trying to come up with the term, but where you find oocytes in the male testes is quite high in the Susquehanna and very little of it is seen the Delaware or the Ohio. I thought I would mention that. When you get to the causes, have you looked at all yet of correlating what you're seeing even in the Chesapeake with those types of water quality variables or other things?

DR. GAUTHIER: Very good observation and a very good question, and that is that question that we've been asking for a while ourselves. The short answer is we haven't rigorously done the studies yet to try to look at the correlation of disease data with weather patterns. The complicating factors to that is this is a chronic disease; so if the fish receive a stressor in year one, we may not see the effects of it until year three or year two or year four.

Until we have a little bit better handle on what that lag period is or how far down the road we need to look at disease effects, it is very difficult to really align weather conditions with disease patterns. I can say that in one of the things I put up in one of my slides was – you know, the question is whether the disease is getting better or worse from year to year.

One thing that we did find in the study that we did from '03 to '05 that was surprising to us is that when we included year as a covariate in our models so we basically wanted to see whether a year-to-year variation was a significant contributor to the model, we got non-significant effects, so it looked like the disease was stable in the bay between '03 and '05. I'm drawing a blank right now on exactly what weather conditions were in those years, but I do remember that they were variable.

It's a great question, but I'm not sure we know enough to really be able to rigorously address that yet, but it is something that we should definitely look at in the future, especially since – you know, as I said, myco is a stress disease in many systems, and this is a dominant hypothesis we're looking at right now is that the reason we are seeing disease not only in Chesapeake Bay but in striped bass versus other species is that striped bass may have – there may be a combination of factors which is causing a generalized stress on certain portions of the population which is causing them to experience higher disease rates.

CHAIRMAN TRAVELSTEAD: I still have a number of people on the list who have questions, and I would ask that you just keep in mind we're running out of time and we still have a couple of more agenda items. Paul.

MR. DIODATI: I'll try to quickly. My recollection of migration rates for striped bass always suggested that as males grow older they don't participate in the coastal migrations. In fact, in Massachusetts for young male fish two to three years old we will see a sex ratio of about 50/50 male/female, but as they get older, up about six or seven, it becomes nearly a hundred percent females, suggesting that the males don't migrate consistent with the need for striped bass to have many more males fertilizing a single female.

I'm wondering if that is something you considered relative to the differences in the male/female incidence of disease, plus the higher percentage of younger fish with the disease, so it seems to be something that is nurtured in the bay. Secondly, as fish leave the bay with a condition two or three disease, have you seen a situation where that condition improves in later years?

DR. GAUTHIER: In the Chesapeake Bay I think, if I remember what you said correctly, we see a little bit

different situation in terms of the sex ratios. When we look at the data that we get from the main stem bay, throughout the course of the year we do see more males than females, but it is probably 60/40, but when we're doing tagging studies in the fall we're looking at 90 percent male, so those form the dominant portion of our sample.

This is one of those things that may vary from system to system is we do have – if this disease is at all influenced by the sex of the fish, we may have different disease dynamics in different systems based on differential migration between the sexes. I think the take-home message here is that we really – in order to understand the disease fully, we can't just look at the fish. It is just one model species. We have to look at age effects and we have to look at sex effects on these fish.

MR. SMITH: He had a two-part question and I was going to address the second part really quick. As far as the condition improving after leaving the bay, we haven't had any Condition 3 fish recaptured outside of the bay. That doesn't necessarily mean they're not entering the coastal stocks and moving, but we have yet to get a recapture from those highly diseased fish outside of the bay area.

As far as the condition improving, there are some signs where you get fish back and it is reassessed at a lower level than it was assessed at originally. That could be due in part to a regression of the symptoms, but it also could be due in part to the fact that when you're tagging the fish and assessing it the first time, you're on a boat, you're doing a couple hundred fish, multiple hundred fish, long days, the operation is moving fast, something could be – it is a judgment oftentimes whether or not a fish is a two or a one.

It could be a very close margin between ten or twelve little pigmented foci or fifteen pigmented foci that makes the difference as compared to when a fish comes back, it is one fish and has the attention of a group of people studying it closely that could change that, but for the most part the disease is – and there is no evidence to contradict the fact the disease is progressive and chronic. It may be able to able to slow or change in the rate at which it progresses fish to fish, but once it is in the animal it is there and it is not going away.

DR. GAUTHIER: If I could just very briefly on that, we do photograph fish in the field and we do photograph them when they come back. We take high-resolution digital photographs of them on both sides. In general, when we see – like Matt says, it is not an absolute objective measure. There is some observer effect going on there or potential observer error. In general, when we see a fish going backwards, this is one of those fish that was on the borderline to begin with, but as Matt said the majority of the time we do see progression of the lesions.

EXECUTIVE DIRECTOR O'SHEA: You mentioned a couple of times one of the inputs being the Chesapeake Bay Trawl Survey, and I'm wondering how much of your work – is there a way to quantify what percentage of the input you used came from that trawl survey; and then moving forward, if that trawl survey were not to be available, what would be the impact to your work?

DR. GAUTHIER: In terms of the modeling work that I was talking about, essentially we completely depend on the ChesMMAP Survey for that work; and if ChesMMAP were to go away – we have a continuous data set now from 2003 to we're doing it again this year; and if ChesMMAP were to go away, the study would go away, so essentially a hundred percent. As far as the tagging program goes, we're on the last year of funding by NOAA right now, so barring further funding coming in, that effort is likely to stop this year.

MR. ROY MILLER: Mr. Chairman, I'll be brief. I'm remembering the 2003 study that was alluded to regarding the incidence of Mycobacterium in Delaware Bay. I wonder since it is not known for certain what percentage of Delaware Bay the striped bass population is actually comprised of individuals that were spawned and reared for several years of their life in the Chesapeake Bay if perhaps a significant proportion of that 18 percent could be explained by immigration into the Delaware Bay from the Chesapeake Bay and the same thing for North Carolina. I just wanted to point that out. Thank you.

DR. GAUTHIER: Yes, I think that is absolutely correct is that again we don't often know exactly or we never know exactly what the life history of the fish has been when we capture it, so, absolutely, straying between systems may account for some of the disease prevalence we see outside of the Chesapeake Bay.

MR. SMITH: Just one final note, with the tagging study there are fish that are tagged in the Chesapeake Bay that get recaptures in places like Delaware and North Carolina and also direct evidence of fish making that migration from the bay into those other

areas. Whether or not they stay there for any extended period of time is impossible to say, but at any given point a person could be catching a fish in Delaware that came from the Chesapeake Bay.

MR. MILLER: If I could put our learned speakers on the spot for just a second, would you speculate that there may be an advantage to an animal that immigrates from the Chesapeake Bay in terms of its likelihood of surviving the exposure to Mycobacterium?

MR. SMITH: If I can strictly speculate, it is difficult to say. It does seem with what David presented earlier that prevalence increases with age; so from that line of analysis it seems pretty evident that the longer you stay in the bay seems to be sort of the source of the problem, the more likely it becomes that you become infected and become diseased, but then again we also have seen it in young-of-the-year fish and age one fish which don't necessarily have a chance to escape the bay. There may be some advantage for a fish that packs its bags and leaves early on in life, but it also may be infected even it is running out the door and it may not get out in time.

MR. GOLDSBOROUGH: It seems clear that this is a serious issue for us. On that point, I would note the conclusion of the technical committee that if natural mortality is as high as simulated, that management will have limited options to control stock dynamics via regulations because fishing mortality will represent a small portion of the total mortality.

This is an issue that it behooves us to get a handle on and attempt to correct at our earliest convenience. What are the causes? It is clear from the presentation that we don't know definitively, but it is also clear, if I understood right, that it is a matter of physiological stress of some sort in Chesapeake Bay, and that there are two most likely culprits; one being nutritional stress and the other being water quality stress. I'm seeing heads nod.

I just note for the record on the first one, the nutritional stress, that this underscores our work in the Menhaden Board – and perhaps we'll come back to this at the spring meeting – in our efforts to deal with possible localized depletion in the Chesapeake Bay and ensure that there is sufficient forage base there for striped bass. Certainly, providing sufficient forage is an important objective for us regardless of whether we have proof that is the cause of Mycobacteriosis in striped bass in the bay.

On the second point, water quality in the Chesapeake Bay, it seems to me it is increasingly clear that this is an important issue or critical issue, if you will, for all coastal states that fish on any stocks coming out of the Chesapeake Bay but striped is, of course, the best example. In the clips that we are sent we see references from fishery stakeholders as far away as Maine that water quality in the Chesapeake Bay is the source of some of their problems with the fishery.

What might we be able to do about water quality? I just bring to the attention of the board that there is legislation pending in congress right now, Senate Bill 1816, which has become known as the Chesapeake Clean Water Act. It would amend the Chesapeake Bay section of the Clean Water Act to deal with nitrogen pollution, which is the engine that drives reduced dissolved oxygen in the bay, which I think is our most likely water quality stress.

Reference was made to the temperature oxygen squeeze which has been well documented to affect striped bass for many years. We heard Leroy just mention oxygen as a problem for small-mouth bass just upstream, too, so we know this is a concern. That legislation, I'll note, does appear on the commission's tracking sheet as a Tier 2 priority. I'd like to suggest that we re-examine that and perhaps consider raising that priority.

I'm not sure what Tier 2 allows us to do. Perhaps Vince would want to speak to this, but certainly a letter from this commission representing the interest of all east coast states to the sponsors of that legislation would go a long way towards making the statement that water quality in the Chesapeake Bay is critical to all coastal fishery stakeholders along the Atlantic. Thank you, Mr. Chairman.

CHAIRMAN TRAVELSTEAD: Thank you, Bill. A.C., you have the last question and then we're going to move on.

MR. A.C. CARPENTER: I'll pass.

CHAIRMAN TRAVELSTEAD: You're going to pass, okay. Bill, I think your last request might best be brought up at the policy board. I suggest you might do that. We're going to move on now. Thank you, gentlemen, for being here today and for your excellent presentations. Okay, we're going to go on to Agenda Item 6, an update on the Cooperative Winter Tagging Cruise.

DISCUSSION OF COOPERATIVE WINTER TAGGING CRUISE

In the interest of time, it is my understanding that funding is not available in all likelihood for the survey this year, and that obviously has some serious implications. I am going to call on Wilson and Steve to give a further update, but it seems to me there are a couple of things that the board needs to do.

One would be to sort of refer the question of funding and who is responsible for the survey to the policy board since there are implications beyond striped bass. I also suggest that we might task the technical committee with looking at questions like how often should this survey be done, whether it needs to be done every year or every other year and how many fish should be tagged and things of that nature, so be thinking about those two things while we hear from Wilson and Steve.

DR. LANEY: Just as a reminder, the previous technical committee chairman, Dr. Desmond Kahn, sent a memorandum to the board chair at that time, Dr. Gibson, back in October – October 16th, to be exact – of 2008. I don't know that all the questions you just posed were addressed in that memorandum, but Dr. Kahn did lay out what the consequences would be of missing a year of the tagging cruise. I think Nichola can resend that memo out to the board just as a reminder.

The present status is, as you said, we have currently a lack of funding from our traditional partner who has provided the vessel, and that is the National Marine Fisheries Service who has provided the vessel or funding to charter a vessel in 21 of the previous 22 years. There are vessels available that are interested in doing the work. There are a couple of university research vessels, the Cape Hatteras at Duke, the Hugh R. Sharpe at the University of Delaware, and there are at least three trawlers that I'm aware of are possibly interested.

One is of those is in the Gulf of Mexico. There are two on the east coast of the U.S. The principal partners for the cruise with regard to the remainder of the funding, which is annually required to undertake it, which is a not insubstantial amount of funding, most that generated through in-kind contributions, are prepared to participate should funding be available to underwrite a vessel to do the work.

Everything is pretty well lined up. We would have to obviously make final decisions about which staff would participate once we knew what dates were available. I will say that the window for doing the work is rapidly narrowing. Normally we would have either done it by now or been out doing it this week and next week.

We've done it as late as February 12th. Based on my inquiries there is still some of the other species that we've added on to the cruise objectives during the years will still be out there through possibly as late as mid-March. The striped bass, I don't know, we've never done it later than February 12th. The potential is still there if we can secure the funding.

MR. MEYERS: The last thing I was working on in the office before coming over here yesterday afternoon, we're incorporating comments on draft letters from our Acting Assistant Administrator for Fisheries to the regional directors of the U.S. Fish and Wildlife Service Northeast and Southeast Region and also a response to a letter from the Director of Marine Fisheries for North Carolina.

At this point all I can say is that the consideration for funds for this cruise is currently in consideration. I would also like to, if I may, suggest that there is a need for a broader review of priorities with respect to surveys by the commission. Within the FY-10 budget, the money that had been earmarked congressionally for surveys of shark longlining essential to that stock assessment, money that would go to Virginia Tech for the Horseshoe Crab Survey have all been zeroed out.

I would suggest that perhaps at the policy board, if you, Mr. Chairman, feel it is appropriate that there is a discussion as to what resources that we have under the Atlantic Coastal Act and other under-funds that are going to be available in FY-10 for some of these external reviews, including the work that you mentioned earlier – excuse me, the executive director mentioned in the Chesapeake Bay for that survey.

As you may have heard in the press, we're going to be level-funded probably for the next several years. We need to have a better understanding of what resources we're going to have and how we're going to most effectively use them. Thank you, sir.

CHAIRMAN TRAVELSTEAD: Thank you. Is there any objection to elevating this to the policy board for discussion of the sort of priorities of the survey issues that Steve outlined? Wilson.

DR. LANEY: Just one comment and that is to note that the Cooperative Winter Tagging Cruise is not a survey. It is a tagging cruise. We tag fish. We don't

run systematic sampling stations or anything, so just a technical correction to the record there.

CHAIRMAN TRAVELSTEAD: Thank you. Then we'll ask that the policy board take that up. Anything further on this item? Seeing none, we're going to move along to Item 7, Discussion of Coastal Commercial Quotas. Pat Augustine, this was your agenda item, but before we hear from you I think Nichola has a brief history of this issue. It seems to me we're to the point where the board needs to either make a decision or put the issue aside, so just keep that in mind after you hear from Nichola.

DISCUSSION OF COASTAL COMMERCIAL QUOTAS

MS. MESERVE: This information was provided in your meeting overview. It essentially gives the history of recent quota motions in the last nine months or so.

Back in May of 2009, there was a motion to initiate an addendum to increase the coast-wide commercial quotas, and that motion failed. At the same meeting there was another motion to initiate an addendum to allow unused coastal commercial quota rollover, which passed.

In August, when the board reviewed the Draft Addendum II that resulted, there was a motion to add a provision to create interstate transfer allowances, and that motion failed. Then in November, after the public comment period, there was a motion to approve Addendum II allowing up to 50 percent of a state's quota to be rolled over, and that motion failed.

MR. AUGUSTINE: Thank you for that, Nichola. To all the points that you mentioned, it just appears that we've been at a stalemate with the striped bass, the sacred cow, if you will, of all species of fish, both along the ASMFC and other places. It just seems to me that if we're going to be treating both sectors, commercial and recreational, I remind you all that if you look at the discard rates for recreational every year, they're somewhere in a number that is far in excess of the annual commercial quota.

The commercial quota that fishermen that fish for those that are doing hook and line, their discard rate I believe is 10 percent or less. They're very good, they're very aggressive. As you all know from a health issue, the health department or health notices out there say to eat more fish, they're available.

All of our fishermen are being squeezed and squeezed and squeezed for all the various fisheries we have out there. Striped bass consistently – the spawning stock biomass is at least 30 percent above the target year after year after year. I just must remind the board members as we keep rejecting increasing the commercial quota, I have to ask you what do striped bass eat?

We have single-species management. We do not ecosystem management yet. We don't have multiple species of fish being managed at one time. They're all single species. Until we get to an ecosystem management, for the life of me I can't understand how we can balance the needs of one group, either the recreational or commercial, as the case may be, to the cost of everyone else.

Again, I'm not sure what the motion has to be, what more information we have to put on the table to get people off the dime to look at the fairness of whether or not the commercial fishermen should have an increase in their quota. If that stock were in danger at all, I would be the first guy to say no way, Jose, leave it where it is, let's protect it and let's do what we're doing.

But year after year we hear the same, the same, same, same, game fish status for striped bass to protect these fish. I just think that at this meeting I'd like to hear from some other folks who are being affected by this control on the commercial fishing quota and its effect on their income as an economic part of this whole thing.

Likewise, the effect on increasing that quota, as the technical committee reviewed several meetings ago, that we could increase that quota by a number that would equal about 30,000 fish a year. I think that was a 25 percent increase in their quota. It would have zip in terms of an effect upon the overall status of the stock, zip. It was a blip, 1 percent.

I think some of you folks should try to look a little more realistically, what is reasonable, what isn't reasonable. There are enough facts out there that I really think that this could be a very objective management decision as opposed to an emotional one that says protect the striped bass at all costs for only one sector.

Mr. Chairman, I would want to go ahead and try to initiate an addendum, but I would like to hear what other comments other folks would have around the table. I don't want to put the board in the situation where we have been two or three times. The last time

we were six in favor and eight opposed, very close, so I'm not sure any of the board members may have changed their opinion about the validity of increasing the commercial striped bass quota. Thank you for that, Mr. Chairman.

CHAIRMAN TRAVELSTEAD: Pat, I'm not sure that further dialogue will help at this stage. We've talked about this so much over the last seven or eight months, it seems to me that the only way you can get an answer to the question is if somebody makes a motion to go forward or not and we vote it up or down. I mean, we've heard the comments over and over on both sides of the issue, so, board members, proceed accordingly. Jim.

MR. JAMES GILMORE: One thing I would like to add is maybe the decision that was made many years ago is actually having a bit of a problem or an effect on us now. Back in the mid-eighties when the fishery was shut down, there was a commitment or a promise, for a lack of a better term, in New York to the Hudson River commercial fishermen that when the fishery was rebuilt, that fishery would be opened again to commercial harvest.

We are constantly berated at meetings now that this fishery has been rebuilt for many, many years and yet there is no commercial increase. The effect it is having now is we have regulations in place now or about to be in place that are closing down the shad fishery. The review that is going on right now, this issue is coming back to haunt us now.

In fact, there is a threat of legal action because as much as the shad fishery needs to be closed down – and no one disagrees with that – they don't trust us anymore, and they're using striped bass as the poster child for this argument. It goes a little bit beyond just what happened with striped bass and we want to make it a game fish.

We've got to start looking at if we're managing the fishery properly, we need to be making it available in its banner years as opposed to restricting it in its limited years. We're at that point now and we don't seem to be able to get out of the box here. Again, Pat made a good point. Just that simple rollover provision was a 1 percent issue.

We talked about this morning about 1 percent on the scup fishery and it was deemed irrelevant, but now 1 percent was voted down because it was considered a significant issue in the striped bass fishery. We really need to start helping out the commercial guys and helping us out. I mean, we hear about it every meeting at our councils back in New York about when are we going to expand this fishery. Thank you.

MR. AUGUSTINE: Thank you for that, Jim. **I would like to move that we initiate an addendum to increase the coast-wide commercial quota.**

CHAIRMAN TRAVELSTEAD: Is there a second to the motion? **Seconded by North Carolina.** Discussion on the motion? Tom Fote.

MR. FOTE: Just a question; I think the PCB level is still about 2-plus in the Hudson River as far as the last studies I've seen so it wouldn't be open for commercial sale, anyway. A large part of that ocean that is basically closed along the New York coast is closed, and they could open that fishery right now on the coastal side but they haven't done it because of the PCB contamination.

MR. AUGUSTINE: In response to that, the health issue was at two parts per million, and it has been less than 1.2 for the last three or four years.

MR. R. WHITE: Mr. Chairman, I think as you said earlier we've been over this and over this again, and it is pretty clear, the arguments on both sides. I think the only thing you can do is what we've been doing for the last two hours, and for the last two hours I haven't heard one positive word. Everything is concern. A lot of these issues can put us not in the position of increasing harvest. Some of these things might put us the other way where we're going to have to cut back on harvest, both recreational and commercial. I strongly oppose going forward.

MR. TERRY STOCKWELL: I certainly respect your concern for additional opportunities for the commercial fishermen. They're all having hard times. My concern has got to be for the continued decline in opportunities for the northern latitudes recreational and charterboat fisheries. As Ritchie said, particularly given the presentation that we've heard this morning, this isn't the time and I'm adamantly opposed to this proposal.

MR. GOLDSBOROUGH: Mr. Chairman, I've got a lot of things that I would say on this subject. I do appreciate the sentiments supported, but I agree with the previous two speakers that now is not the time. I was going to make a suggestion, given your comment that most of the arguments and discussions have been made at this board for the last few meetings – in the last year, let's say – that perhaps staff could put together a brief white paper summarizing it all that

we could devote significant time to at the May meeting, given the lateness of the hour right now.

CHAIRMAN TRAVELSTEAD: Everybody can think about that. Craig.

MR. CRAIG SHIREY: Mr. Chairman, I would like to go on the record as supporting this motion. Delaware has a very, very small commercial quota, and it is about the only viable fishery that we have left with the decline in the shad stocks and the collapse of the weakfish stock. The spawning stock biomass numbers are very good and the fishing mortality rate is very low. Our commercial fishermen are always petitioning us to increase their very small quota.

MR. A.C. CARPENTER: I would like to speak in behalf of the motion. There has always been a convenient excuse whenever this comes up. Today's report is just the most recent convenient excuse. What has occurred is a reallocation by design of this program, and it has hindered the commercial quota, and I will support this motion.

MR. AUGUSTINE: I just wanted to respond to the comment about fewer and less fish in the northeast, up along your shorelines. After listening to Wilson's report, he indicates in his report that the fish are moving farther north and away and farther offshore. Whether it is weather conditions, whether it is the temperature conditions, whatever it happens to be, so that is another one of those issues that in my mind unless it can be supported other than making a fact that they're not available, I would have to rely on Wilson's report saying that they are moving farther offshore and the water has been cold and there has been a definite effective change.

Thank you, A.C., I appreciate your comment. There is no question; every single year we have another excuse as to why we can't do this. Are we managing or are we not managing? Do we have the guts to make a decision, go back home and stand the heat? That is what our job is, stand the heat. Without any further discussion, Mr. Chairman, I call the question unless someone has a burning comment.

CHAIRMAN TRAVELSTEAD: I saw one hand in the audience so we will hear from Mr. Leo. Steve, go ahead while Mr. Leo is coming up.

MR. MEYERS: Mr. Chairman, is it my understanding that by affirming this motion, that a document would be put forth by the commission for public comment and public review on this issue?

CHAIRMAN TRAVELSTEAD: That's all we would be doing today is directing staff to prepare a document for public comment and further review by this board.

MR. ARNOLD LEO: You know, back in the May meeting of the commission, the Striped Bass Board said that they would consider a quota increase for the commercial fishery when they got the results of the 2009 stock assessment. Then in the summer 2009 meeting of the commission here in August the technical committee reported on the results of that stock assessment and said that even a 15 percent increase in the coastal commercial quota would have a limited effect and that actually large fluctuations in recreational harvest present a greater level of risk of exceeding the fishing mortality target or threshold.

There you have it; the 2009 stock assessment was available. The technical committee said that giving a 15 or even 20 percent increase would have no appreciable effect on the fishing target. Here we are in February of 2010 looking at this question which has been postponed and lingered around for much too long considering the dire hardships that the commercial fisheries are undergoing right now. Thank you.

CHAIRMAN TRAVELSTEAD: Thank you. With that, we're going to call the question. I assume you need a minute to caucus. Okay, we will be prepared for a roll call vote when you're finished.

(Whereupon, a caucus was held.)

CHAIRMAN TRAVELSTEAD Are we ready to vote? Okay, Nichola is going to call the role.

MS. MESERVE: Maine.

MAINE: No.

MS. MESERVE: New Hampshire.

NEW HAMPSHIRE: No.

MS. MESERVE: Massachusetts.

MASSACHUSETTS: No.

MS. MESERVE: Rhode Island.

RHODE ISLAND: No.

MS. MESERVE: Connecticut.

CONNECTICUT: No.

MS. MESERVE: New York.

NEW YORK: Yes.

MS. MESERVE: New Jersey.

NEW JERSEY: No.

MS. MESERVE: Pennsylvania.

PENNSYLVANIA: No.

MS. MESERVE: Delaware.

DELAWARE: Yes.

MS. MESERVE: Maryland.

MARYLAND: Yes.

MS. MESERVE: District of Columbia.

DISTRICT OF COLUMBIA: Abstain.

MS. MESERVE: PRFC.

POTOMAC RIVER FISHERIES COMMISSION: Yes.

MS. MESERVE: Virginia.

VIRGINIA: Yes.

MS. MESERVE: North Carolina.

NORTH CAROLINA: Yes.

MS. MESERVE: Fish and Wildlife Service.

U.S. FISH AND WILDLIFE SERVICE: Yes.

MS. MESERVE: National Marine Fisheries Service.

NATIONAL MARINE FISHERIES SERVICE: Yes.

CHAIRMAN TRAVELSTEAD: If I counted correctly, it was eight in favor, seven opposed, and one abstention**. The motion carries**.

MR. AUGUSTINE: Thank you. Do we want to put any sideboards on it, Mr. Chairman, or we'll do that when we develop it?

CHAIRMAN TRAVELSTEAD: Well, let's give staff a little bit of rein and they'll bring it back to us. We can modify it and then proceed. Paul.

MR. DIODATI: We agreed earlier that we were going to come back in May and hear from the technical committee relative to juvenile production particularly in the Chesapeake Bay, which might be giving us a signal that requires a cutback in 2011. I would suggest that if we get that kind of a signal, then this addendum be off track somehow or be tabled.

CHAIRMAN TRAVELSTEAD: I think that will be a decision for May when we see both the report from the technical committee and the draft addendum in hand by the staff. Anything further on this issue? Anything further to come before the board? Wilson.

OTHER BUSINESS

DR. LANEY: Well, just a technical response to Mr. Augustine noting that from the Cooperative Winter Tagging Cruise data the fish seemed to move north and offshore. North was a relative statement in that context, Pat, in that it is north from North Carolina to Virginia and not to New England. Then the other comment is relative to the fact that there are a whole lot of issues pending before the technical committee, and we're going to have some interesting meetings between now and May, so lots of things could conceivably change.

ADJOURNMENT

CHAIRMAN TRAVELSTEAD: Thank you; we are adjourned.