PROCEEDINGS OF THE

ATLANTIC STATES MARINE FISHERIES COMMISSION

ATLANTIC MENHADEN MANAGEMENT BOARD

Crowne Plaza Hotel - Old Town
Alexandria, Virginia
March 22, 2011

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Doug Grout, NH (AA)
G. Ritchie White, NH (GA)
Rep. Dennis Abbott,NH, proxy for Rep.Watters (LA)
Bill Adler, MA (GA)
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James Gilmore, NY (AA)
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Adam Nowalsky, NJ, proxy for Asm. Albano (LA)
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Tom O'Connell, MD (AA)
Lynn Fegley, MD, Administrative Proxy
Bill Goldsborough, MD (GA)
Russell Dize, MD, proxy for Sen. Colburn (LA)
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Jessica McCawley, FL (AA)
Sen. Thad Altman, FL (LA)
Steve Meyers, NMFS
A.C. Carpenter, PRFC
Jaime Geiger, USFWS

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

Ex-Officio Members

Rob Latour, Technical Committee Chair

Staff

Vince O'Shea
Bob Beal
Toni Kerns
Chris Vonderweidt
Kate Taylor
Mike Waine

Guests

David Wallace, Wallace & Assoc
Pete Jensen, Wallace & Assoc
Mike Leonard, ASA, VA
Alexei Sharov, MD DNR
James Price, CBEF
Bob Geisler, MSSA
Charles Hutchinson, MSSA
Clint Waters, MSSA
Eric Braun, EHFAC, NY
Phil Kline, Greenpeace
Nina Randolph, VA Envir. Endow.
Raymond Kane, CHOIR
Pam Gromen, NCMC
Ken Hinman, NCMC
Frank Kearney, CCA VA
Jerry Benson, CCA VA
Dave Smith, MD SPFA
Bob McCulley, MD SPFA
John Kilday, CCA VA
Jay Odell, Nature Conservancy
Ken Hastings, Mason Springs Cons.
Rick Robin, MAFMC
Ed O'Brien, MCBA/NACO
Jimmy Kellum, Kellum Maritime
Wilson Laney, MSFWS
Benson Chiles, Atl. Highlands, NJ
Julie Vanderslice, Ofc. Del. Murphy
Ron Lukens, Omega Protein
Ben Landry, Omega Protein
Monty Deihl, Omega Protein
Kristin Cevoli, PEW Group
Jud Crawford, PEW Group
Alison Fairbrother, Pub.Trust Proj.
Shaun Gehan, Kelley Drye
Drew Minkiewice, Kelley Drye
Bonnie Bick, Mattawoman, MD

The Atlantic Menhaden Management Board of the Atlantic States Marine Fisheries Commission convened in the Presidential Ballroom of the Crowne Plaza Hotel Old Town, Alexandria, Virginia, March 22, 2011, and was called to order at 11:10 o'clock a.m. by Mr. Robert E. Beal.

CALL TO ORDER

MR. ROBERT E. BEAL: We can go ahead and get started with the Atlantic Menhaden Board. Before we get started, obviously I am not Louis Daniel. Louis Daniel is the Chair of this board and he is not able to be here at the meeting all week. He has got a number of legislative issues that are keeping him at home this week.

There is no vice-chair for this board so the commission policy and practice is for staff to step in and chair the meeting in the absence of the chair and vice-chair. With that, that is the reason I'm sitting up here and not Dr. Daniel.

INTRODUCTION OF NEW COMMISSIONERS AND PROXIES

A couple of comments before we get started; at the outset of the meeting yesterday there were a few introductions of new folks sitting around the table and in the room, and I wanted to go ahead and reiterate those because not everybody was here yesterday to be introduced to the new commissioners around the table.

We have Senator Brian Langley from Maine who is new to the table. Rick Bellavance is proxy for Peter Martin from Rhode Island. We have Representative David Watters from New Hampshire. Dennis Abbott is sitting as David Watters' proxy for this meeting. We have Senator Richard Stuart from Virginia in the back corner.

We have Adam Nowalsky as proxy for Assemblyman Albano. We also have Norman Olsen from Maine as their administrative commissioner. We also want to introduce one new staff member at the commission; it's Mike Waine. Mike is eventually going to be taking over menhaden. We didn't think it was fair to throw a new person right into the menhaden fire. It may actually be classified as inhumane, so we're going to give him six or eight months to get up to speed and he can take over menhaden after that. I want to thank Toni for stepping in and pinch hitting for Atlantic menhaden after Brad Spear left the commission.

APPROVAL OF AGENDA

I think those are the announcements that I have before the meeting. With that, we'll go ahead and jump into the agenda. The first agenda item is approval of the agenda. Are there any additions to the agenda? I would like to make one. Senator Stuart from Virginia sent a letter to the commission conveyed via Steve Bowman that he would like to request a discussion of menhaden research at the end of the meeting.

We'll put that under other business and we can have a brief discussion on Atlantic menhaden research toward the end of this meeting. Seeing no other changes, is there any objection to approving the agenda? All right, seeing none, the agenda is approved.

APPROVAL OF THE PROCEEDINGS

Approval of the proceedings from November 8th of last year; are there any changes or amendments to those minutes from the meeting of last year? Seeing none, those minutes stand approved.

PUBLIC COMMENT

Public comment; I've got two names that signed up in the back of the room for public comment.

Again, this public comment period is for items that are not on the agenda. If you want to comment on an agenda item, we'll provide some opportunity, time permitting, to comment on that agenda item when we get to it. The first person I have on the list is Ken Hastings.

MR. KEN HASTINGS: Good morning; my name is Ken Hastings. I live in Mechanicsville, Maryland. I'm a recreational fisherman and certified tree hugger. At the time of Amendment 3 I probably wasn't paying enough attention, but at that time I understood that Atlantic menhaden were not overfished and were not being overfished, but as a matter of precaution there was going to be a cap set followed by an exercise to determine if there was localized depletion in the Chesapeake Bay.

By Amendment 4 in 2009 I was paying a little more attention and when your staff people came to Maryland for the public hearing I asked, well, what is the status of this effort on determining localized depletion. I was advised at that time

that there had been no status and in fact there was no definition agreed upon for localized depletion.

Now I understand that some of the data has changed and maybe we have been overfishing, and so I'm hoping that sometime today I'm going to hear in this discussion, maybe at the end when you come to your research, of what the status is of the effort to determine if the Chesapeake Bay actually has local depletion. I would think the fact that the stocks now may be overfished we would put a little more priority on what the status of the Chesapeake Bay is. Thank you.

MR. BEAL: Thank you, Ken. The next person on the list is Monty Diehl.

MR. MONTY DIEHL: Good morning. My name is Monty Diehl. I'm the general manager of the Omega Protein Plant in Reedville. I hadn't planned to speak here today, but I felt compelled to at the last minute. I am part of five generations of menhaden commercial fishermen right out of Reedville. I'm back in this family business now after a career as a military officer.

But what I hear often is anecdotal information on the fishery, and I just wanted to offer a few of my own thoughts just based on what I've seen personally. This past year the 2010 season was one of the best fishing years that we had at that Reedville Plant in recent history. We saw an abundance of menhaden both in the Bay and along the Atlantic coast.

Although we don't start fishing for another six weeks, our season, we've already seen – our plane spotters have already seen more fish entering the Bay this year at this time this early and moving north than what most of them have ever seen in a 20- and 30-year career who have done this. We've also seen over the last three years more smaller juvenile menhaden in the creeks and the rivers and the Bay, at least where I live, and it was verified to me by NOAA scientists who I've talked to on the same subject.

I know that is anecdotal and you're here to look at the science, but you see so much of that type of information in the papers or anti-information that I thought it was worth bringing up here. We do have an awful lot of experience at that plant dealing with menhaden and its migratory patterns and what they do and what we see.

A few of the things that we do know and I believe that you all have discussed probably many times is that we catch a very small percentage of this stock each year, very small. We've done this for over 130 years right there in Reedville, and now there is less fishing pressure on this stock than ever before, probably in that whole 130 years.

We don't catch age zero fish as verified by the NOAA representatives who are at our plant everyday who take samples on all of our vessels. We have little or no bycatch as verified by VMRC officers who are at our docks everyday looking in our fish holds and looking in our holding boxes for what we offload.

What I know from personal experience also is that in the 1970s, eighties, and early nineties you could not catch a rockfish in the Chesapeake Bay or you were very, very lucky if you could find one because I used to try quite often. But only through the concentrated management efforts of that stock in the late eighties and early nineties and going I guess really right up until today, that stock made a tremendous rebound where now that's really the sportfish of choice in the Bay and for me as well.

But during that entire time we did not change the way we do business, not one single bit. We continued to put the same amount of pressure on that fishery in the Bay and along the coast as what there is today, but that stock rebounded. And what I draw from that and what I believe many people probably should is that, yes, the menhaden is very important. There is no one who is more concerned about the future stock of that menhaden than myself and my family and all my co-workers there in Reedville.

But because we fish for menhaden is not the reason that people go out and don't catch a rockfish on any particular day. That stock rebounded while we continue to do exactly what we've done forever. I just want to leave that with you, and I appreciate your time and I ask that you seriously look at this issue before you make any decisions. Thank you.

ELECTION OF THE VICE-CHAIR

MR. BEAL: Thank you, Mr. Diehl. Now we move on to my favorite part of the agenda, which is the election of the vice-chair. Any nominations? Mr. Gibson.

MR. MARK GIBSON: **I'd like to nominate Mr. Robert Boyles for vice-chair of the**

Menhaden Board.

MR. BEAL: Is there a second to that motion? Pat Augustine.

MR. PATRICK AUGUSTINE: Mr. Chairman, there is a second to that motion and I move we close the nominations and cast one vote on behalf of Mr. Robert Boyles.

MR. BEAL: Thank you, Mr. Augustine. Vince.

EXECUTIVE DIRECTOR JOHN V. O'SHEA: Mr. Chairman, a couple of puzzled looks around the table. Just a reminder that the vice-chair would come up to be chair of the board in about two years, and by that time Mr. Boyles would be finished with his position as chair of the commission. Thank you.

MR. BEAL: Thank you, Vince. With that clarification, is there any objection to Robert Boyles being elected as the vice-chairman of the Atlantic Menhaden Management Board**? Seeing no objection, the motion carries.** Congratulations, Mr. Boyles. That brings us to Agenda Item Number 5, consider acceptance of revised benchmark stock assessment report for management use. Toni Kerns.

REVISED BENCHMARK STOCK ASSESSMENT REPORT

MS. TONI KERNS: At the annual meeting in November staff went over the fact that we had found an error in the code in the 2009 Benchmark Menhaden Stock Assessment. The TC went through the management document and found all the places that we needed to make changes in the document. That document was on the Briefing CD.

All the changes that were made in the document were highlighted in yellow. As a reminder, that error in the code led to a change in the status of the stock. We are not overfished but overfishing is occurring. This was the first year in the last nine years that overfishing has been occurring and we are right on that threshold mark.

The only place in the stock assessment where this change in stock status is not reflected is in the summary of the Peer Review Report; and that is because through the SEDAR process we cannot make changes to Peer Review Report unless we went back through peer review. It was recommended because it was only an error in the code and not a change in the model, that it would be fine not to go back and do an additional peer review.

MR. BEAL: With that explanation, is there a motion to approve the revised benchmark stock assessment? Pete Himchak.

MR. PETER HIMCHAK: I had a quick question for Toni. No, I understand all the changes that were made highlighted in yellow, but you said that the overfishing definition – the F over the Fmed of 1.0; is that the target or the threshold?

MS. KERNS: That's the threshold.

MR. HIMCHAK: Okay, so can I ask a question and maybe Dr. Latour can help me out on this. The overfishing definition of F over Fmed is 1.0. The terminal year for 2008 was 1.004, so technically we are overfishing. Are there any levels of precision around either of those two numbers? In other words, is there a potential for overlap? I'm trying to determine the impact of the statement that we're overfishing; 1.004 versus 1.0.

DR. ROBERT LATOUR: There are no standard errors, if you will, or confidence intervals that you can attach to that point estimate in 2008. The form of uncertainty that the assessment team looked was sort of a bootstrap analysis, which basically is rerunning the assessment 2,000 times and generating 2,000 overfishing/overfished characterizations.

I don't have the numbers exactly in my head, but I want to say there was a 30 percent chance – or 30 percent of those runs led to an overfishing characterization and 60 percent did not, and zero percent of those runs led to an overfished condition and a hundred percent led to not overfished condition. In our mind there was an appreciable percentage of those runs that you would conclude overfishing is occurring, which can help hopefully aid your interpretation of the 2008 status of stock point.

MR. BEAL: Thank you. With that clarification, is there a motion to accept this updated benchmark assessment? Pat Augustine.

MR. AUGUSTINE: Mr. Chairman, **I move to accept the updated document as presented by Ms. Kerns.**

MR. BEAL: Is there a second to that motion? Bill Adler, thank you. Any discussion on the motion to approve the revised benchmark assessment? Dr. Pierce.

DR. DAVID PIERCE: I would appreciate a little further clarification. Going to the assessment report under the stock status definition; under overfishing status, that's 8.3.1; would you please elaborate a bit regarding the statement at the end of that particular section where it says a range of status determinations are shown based on the sensitivity runs in Table 7.8; some suggesting overfishing and others do not. That statement is in there; could you comment on the significance of that particular statement in terms of how we should react to whether we are overfishing or not? It's kind of wishy-washy; we are, we're not, we are, we're not.

DR. LATOUR: I would have to go look at exactly which sensitivity runs correlated with an overfishing definition. I think by definition alone, though, falling on the line or having F 2008 over Fmed equaling 1 or greater than 1 warrants the interpretation of overfishing. I think that's unequivocal.

Relative to Mr. Himchak's question about the confidence interval on that, the best we can do is our characterization of uncertainty which further suggests that there is an proportion of chances that – or appreciable proportion of the model runs that led to an overfishing conclusion. Which parameters were modified under which uncertainty framework and thus which status of stock determination, I would have to review the document more closely at this time.

DR. PIERCE: Okay, if I may, that's up to 2008, correct, and there is no way for us to get any idea as to 2009 or 2010?

DR. LATOUR: That's correct; the assessment frequency is every three years so we would not be able to re-evaluate status of stock without conducting an assessment.

DR. PIERCE: And there are no other ways to get some idea or some inkling as to where we might be? Recognizing that we have to wait a few more years before another assessment can be done, but there is nothing that can be looked at to give us a more timely accounting of where we are, especially in light of the fact that we're over by 0.001, which is pretty small and not very meaningful.

DR. LATOUR: We can certainly look and we do look at trends and some of the input data, but as you know those are limited data. We have accurate records of catches and timely records of catches so we know the harvest over the last few years. We have annual indices of abundance both for juveniles and age two-plus in the Chesapeake Bay. We could certainly look at trends and see if those are trending upwards or downward, but a synthesis of that information into a stock status determination can't occur without another assessment.

MR. BEAL: Any other questions on the motion or comments? Seeing none, is there any objection to approving the updated benchmark stock assessment for management use? **Seeing no objection, the motion carries.** That moves us on to Agenda Item Number 6, which is the technical committee report.

TECHNICAL COMMITTEE REPORT

MS. KERNS: Before Rob starts, on Friday I e-mailed out to the management board an updated version of the TC Report as well as an excel spreadsheet giving guidance on the MSTC report. Staff has copies of those. If you need a copy of either of those documents, could you please raise your hands so that staff can get you a copy.

DR. LATOUR: Just a few acknowledgements to start off; this was supposed to be more or less an off year for the menhaden analyst team, and quite frankly the workload, which is fine, has been equaled or exceeding that of an assessment, so I just want to acknowledge all the hard efforts put forth by the TC; particularly our new lead stock assessment analyst within the NOAA Beaufort Group, Amy Schueller. She shouldered a heavy load both for Atlantic menhaden and now I understand they're engaged in a Gulf Menhaden Assessment, so she has become the menhaden lady, if you will.

I'd also like to extend appreciation to Toni and Genny from staff for keeping me straight. I believe because there is no May meeting this year that this constitutes my last time before you as Chair, so I hope that I've represented the TC well and I hope I've allowed you to conduct your business in an efficient manner. I'll probably remain as a TC member, but you may not see me as frequently.

Just a point of reminder, this came to us as the TC I guess formally in June, but it was discussed at the last May meeting to develop a suite of alternative biological reference points. There was more language to the exact charge but I've captured a bit of it here. The first came directly

from the recommendation of the peer review; that is to say, develop reference points that tie back to an unfished level, either spawning stock biomass or population fecundity.

Also investigate abundance where abundance is defined here to be N, total numbers instead of biomass and this larger question of whether or not an F-based reference point is appropriate for menhaden. We have made some progress on – well, complete progress on number one, reasonable progress on number two, and some progress on number three which is what I hope to present today.

This slide here is not intended to put words in your mouth, but it's more to remind me to convey to you that as a TC we're a bit unsure of which direction we're going with these analyses, and in some regards we feel like we're going in multiple directions without a clear understanding of what the management goals might be for this resource.

We took the liberty of postulating a couple of approaches here. There are just our ideas of what you might be thinking or what may constitute a management objective. Goal 1 is simply – in no particular order – increase abundance or SSB for the benefit of the stock, your traditional single-species approach.

We talked a lot about whether recruitment is low for sustained periods of time or not. We focused heavily on the numbers of age zeros available each year. An alternative goal might be to increase recruitment for the benefit of the stock, another single-species focus. Perhaps Goal 3 would be a broader one in the sense of increasing forage base for predators or in general you might substitute manage for ecosystem services. I'll try to reference these goals as we walk through some of these alternative reference points.

The hope is to just simply provide a roadmap for which reference point approaches might correlate with which goals. So on to maximum spawning potential, following some of the – I guess our August meeting last year, the charge came to us to calculate the fishing mortality rates associated with the current MSP level. That would 9 percent, 8 or 9 percent depending on the length of the time series, as well as 15, 25 and 40 percent of maximum spawning potential.

A reminder here the goal is to identify a fishing mortality rate needed to maintain a given level of fecundity – so I say X percent – relative to maximum level of fecundity under F equals zero. The table here shows you those calculations, so in the first column I just simply have the percent level of MSP.

The second column would be the associated F values for each percentage should you base your inputs on means of the entire time series of information, meaning we use 30 years of data to populate an average M at age vector, we use 30 as the data to populate an average fecundity at age vector, et cetera. The last column represents a more truncated time series where we just used the last five to populate those inputs.

The basic trend is as you would expect, as the MSP percentage climbs the full F associated with that would need to be decreased rather substantially if you were to move into a 25 – or even a 15 percent you're looking at quite a significant drop in F, all the way up to 20 percent of the current level if you were to be at MSP of 40 percent.

The plot on the right is simply the last 20 or so years, 25 years of the current percent MSP from the assessment, which just shows it's bouncing between about 8 and 10 percent. Potential benefits of an MSP approach, you're likely addressing Goal 1. Yes, clearly, this is a single-species sort of approach. Adopting a higher percent MSP should in theory result in higher abundance in spawning stock biomass; and with that would come lower landings or lower harvest.

It may address Goal 2; that is the recruitment goal if that were the objective. However, the caveat or a concern of the TC is that recruitment appears to be somewhat independent of fishing mortality and abundance of adults, meaning that we have high recruits under low SSBs, we have low recruits under high SSBs. There is a lot of uncertainty in the relationship raising the question that perhaps recruitment is more or equally as much an environmentally driven process than correlated with harvest or abundance practices.

Adopting an MSP approach may not guarantee better recruitment, but a larger percentage of adults in the stock would suggest that under favorable environmental conditions we should be able to realize a more stronger year class, so to speak. We sort of felt that this may address Goal 3, the ecosystem goal.

MSP, if it increases abundance or SSB, then that should in theory increase the forage base available to predators, but just a warning that just increasing abundance doesn't always correlate with increased consumption and somehow improved conditions of those predatory stocks. Many biological and ecological processes govern predator/prey interactions. Abundance is just the very beginning.

Some caveats; perhaps an important one here is that the MSP approach assumes the stock was in equilibrium; that is to say that abundance in general for menhaden is not changing over time appreciably. We can probably say that's not a reasonable assumption at this time. We see a decline in the menhaden abundance, or at least our model-based projections of abundance suggesting that an equilibrium assumption may not be valid.

The MSP approach requires a coast-wide quota; perhaps, yes, and optimal implementation would require annual assessments. That is to say if you want to have the most current available information underlying your quota-setting process every year, then you would need an assessment every year. The Beaufort Team tells me this is not likely.

Quite frankly, increasing the frequency of the menhaden assessment is not likely to occur at least in the foreseeable future, which means you'd be relying on say the most recent assessment and maybe some stock projections to set quotas in the off years, meaning the years that are not associated with an assessment. This is not uncommon in other places or for other resources. It's just a clarification of what would be required to implement the approach in an optimal manner.

MSP can provide overfishing definitions but cannot inform anything about overfished status. To try to put some context on the implications of these various MSP percentages, Amy conducted a tremendous number of stock projection analyses. These represent the first projection analyses in a menhaden stock assessment framework that I'm aware of, so it's breaking new ground in some regards for at least the menhaden resource.

TC input along with Amy's diligence at the computer resulted in 45 projections. They each reflect different assumptions about the inputs. The major components of the inputs require defining the stock-recruitment relationship. We considered the three levels there; your standard Beverton-Holt parametric relationship, sort of modeling it as a median value modified by some error term, so not necessarily a parametric relationship with SSB.

There has been some suggestion that there are cycles in the environment such that menhaden recruitment may be following a cyclical pattern, so we investigated that a little bit. We incorporated uncertainty in the form of parametric and non-parametric bootstrap; so for each of these projections we generated 2,000 model runs of them.

The length of the time series used to define the stock-recruitment pattern varied from the entire time series available information, sort of representing all the information we have, to a shorter time series under the hypothesis that we may be in a different regime, a lower productivity regime. As I said, we generated 2,000 bootstraps. For a few of these I've put some plots just to give you a flavor of what we're looking at.

We basically took the median of those 2,000 and a fifth of 95th percentiles or upper percentiles and lower percentiles. A little bit of the generalities; as you would expect, projected SSB and landings were influenced by the assumed stock-recruitment relationship. This is for menhaden probably the Holy Grail, if you will. It seems to cloud our interpretation of many things.

Recruitment variability was high in the projections, which transferred to high variability in the SSB and projected landings. This is sort of obvious, but as the percent SSB increased the spawning stock biomass gave that positive response. It increased and landings declined. The projections went for about 15 years into the future.

What I've tried to do is – we literally had pages and pages of plots, so I've tried to boil these down into a couple that may be informative hopefully. The left panel, on the X-axis, I have the 9 percent MSP or current percent MSP; the 15, the 25 and the 40. I also have the median in this case fecundity levels from 1990-2007, realized median from the assessment just as a point of reference, and I'll speak about that a little bit more here.

The red bars are corresponding to the projections where we assumed a Beverton-Holt stock-recruitment function. The blue bars are we assumed a median stock-recruitment relationship

modified by some error, if you will. As you can see, as the percent MSP increases so does the median fecundity of the projection or the SSB in the projection model; quite a bit actually.

I hesitated putting the realized median as the last bar there all the way on the right because I wanted to do for the point of reference, but I also want to make sure that you recognize that the projections assume a specific nature of the stock-recruitment relationship, which we cannot be guaranteed as true. There may be some disconnect or incongruence in the underlying dynamics that go into the first four grouped bars and the last one.

We don't know what the true stock-recruitment relationship is in the model, so this may not be complete apples and apples, but it hopefully serves as a point of reference. The median fecundities from 1990-2007 were about near the 15 percent MSP or in between the 9 and 15 percent.

On the right is simply the same information plotted relative to the 9 percent, so I divided everything or normalized it all to 9 percent so we have the 9 percent MSP is at 1, and then you can interpret the increase in the bars as the percent increase in fecundity realized from each level of those MSPs. Going to 15 percent gives us about an 80 percent increase up to – let's see, from 1 to 3, so 200 percent increase; a substantial increase in SSB as you increase your MSP and high variability, too.

Here we show the landings of those same projections; decreasing as you would expect. As you increase the percent MSP, the landings decrease quite a bit going from say a normalized value of 1 at the 9 percent level down to 80 to 75 percent of that at the 40 percent level, so it's not much of a decrease or not as much of a change relative to current conditions in landings as it would be for SSB based on these projections.

A bit of a transition – so that concludes where we've got to this point for the MSP work and the associated maybe stock implications or stock dynamics through the projections of the MSPs. If we change our gear a little bit to N-based reference points, kind of step and say, well, what do these provide us; we have to decide some ad hoc reference point based on numbers rather than biomass.

It certainly would address primarily Goal 1, which would be a single-species approach. Presumably the adopted reference point would decrease F; thus we expect to see an increase in abundance. It may address Goal 2 over the period of the assessment. It still remains that recruitment appears to be independent of N; defined as abundance, but the role of the environment still remains a question.

Some of the same caveats or comments about the MSP apply here. There is another sort of sub-analysis that was included under these little N-based reference points, which was done by Dr. Doug Butterworth and his staff. The TC reviewed it and found that it was viable from a technical point of view and it represents an alternative way of looking at N-based reference points. It essentially attempts to formally tie your reference point to the recruitment index.

I wasn't part of the ASMFC structure when the striped bass recovery was underway, but my recollection in readings is that was not unlike what was postulated for striped bass, tying some reference point or some sign of recovery to a suite of consecutive index values for the young of the year relative abundance.

It could be an option and certainly doing so would allow you to focus on preventing recruitment failure. This approach may address Goal 3, but only in the sense of increased abundance would hopefully provide more forage but doesn't guarantee necessarily increased consumption by predators.

Some strong caveats; member of the TC were very vocal about this, there is a strong biological basis for N-based reference points because there is strong evidence that suggests that menhaden exhibit ontogenetic changes in fecundity and size. Taking an N-based reference point approach basically treats all adults equally when we know in terms of reproductive currency that might not be the case. Older animals are more egg productive than younger animals.

In theory recruitment should be more directly related to fecundity or SSB. It's hard for us to detect if that's the case. In this sort of approach, N-based reference points can provide overfished definitions but not overfishing. Here is a plot of recruitment related N on the left; just raw scatter plot. These would be model-estimated recruitments and model-estimated numbers of age three-plus menhaden. On the right is the familiar plot of the recruitment related to fecundity.

There doesn't seem to be an improvement in the relationship, which was one of the questions sort of underlying going down this N-based reference point approach. From our point of view – well, let me get through these and then I'll conclude. These would just be plots of – the upper panel here is the red line would be the median abundance of age three-plus menhaden over the time series, the 30-year time series. The dotted lines represent the 25th and 75th percentiles.

You can see where we lie relative to the median in the last couple of years, kind of either on it or below it. The bottom panel is that same information but just plotted against a ten-year median. Unfortunately the line was scaled across the entire time series. That's a mistake on my part. It's a ten-year median.

If you were to look at the same information for zeros, in the upper panel here, a 30-year median of age zero you can see in recent years we're either mostly below it, maybe one year above the median; the same information for a ten-year median of age zeros. In general the TC felt an N-based reference approach should be approached with a great deal of caution given the lack of biological basis for it and the apparently marginal, if any, improvement in the stock-recruitment relationship when N was plotted against recruits.

A couple of more slides and I'll be finished. Here is just some discussion about the multispecies reference points as part of the charge. Thank you to the MSTC for lots of hard work. They put together four approaches that we were able to review for generating reference points that explicitly included predation effects.

We felt that two of those four were advanced enough for the most viable to be considered at this time with some additional work, of course, but the MS-VPA and the Steele-Henderson approach we felt were most viable. Just a brief description; the MS-VPA is an age-structured model; you're aware of this. It includes striped bass, weakfish and bluefish as its principal predators of menhaden.

You might use this approach to develop predator/prey ratios or estimates of food availability as reference points although to date that has not been done and some effort would need to be invested there. The Steele-Henderson is a biomass dynamic or age-aggregated method for menhaden or in general actually its basic definition is such. Predator/prey interactions are not explicitly modeled relying on diet composition information.

They're modeled more through the form of relating trends and indices and estimating coefficients; so while it's viable, it's a little less explicit as the MS-VPA, which is why we felt it may serve as a secondary or supporting analysis approach. The MS-VPA incorporates all known sources of diet information for the predators that we have. It has been peer reviewed. It has been recently updated so some advantages there.

The Steele-Henderson may offer an alternative approach. It allows for model comparison and it can be used to generate non-equilibrium reference points. Some caveats; additional time would be required to put the MS-VPA into action for reference point generation and it hasn't been done so to this point. We'd have to think about what those reference points should be, construct the analysis, generate the output, and we might want to think more carefully about the numbers of predators in the model.

At least in its current configuration there is only those three principal fishes; and as we know, there are many more predators of menhaden in the environment. The Steele-Henderson, the basic take-home message here is that we probably would require some more testing for it to be brought into the reference point mode.

So just some basic summary; the percent MSP, we expect an increase in SSB with increased MSP. These increases would require large reductions in F, at least based on the analysis, and there is no guarantee of improved R since there is not seemingly a strong relationship between SSB and future recruitment.

Something I didn't put figures in here but was conducted by Amy is she did a bunch of projections where she assumed a constant landings' scenario, and I felt it was worth mentioning. A strong signal in those outputs was that we would fix landings at a constant level, kind of under a simulated quota scenario, and then calculate the associated F corresponding to those landings. The model had difficulty maintaining a constant F.

Each year we would calculate F it would fluctuate wildly giving the suggestion that even if we held landings constant, that F is still quite variable and that this variability seemed to be a result of the variability inherent in recruitment. There was also a high probability of exceeding the desired level of F in this scenario. I bring

that to your attention and we can talk about that more if it's of interest.

N-based F, no improved relationship when recruits were related to N and there is little biological basis for it, so please exercise caution here. And then the multispecies, we found two of the methods quite viable with some further refinement and may provide some insight from the ecological perspective. Thank you and I'll take questions.

MR. BEAL: Thanks for the great report, Rob. Before you get into questions, Rob, I just want on behalf of the Chair thank you for the last two years of work. I know I've learned a lot listening to you and talking with you, so I appreciate that. Questions for Rob; I imagine there might be one or two. Doug.

DISCUSSION OF TECHNICAL COMMITTEE REPORT

MR. DOUGLAS GROUT: My take home from those last summary slides is that if we had the time, the preferred method for developing reference points would be to use the MS-VPA from the technical committee's standpoint; is that correct?

DR. LATOUR: I think that goes back to the objectives, not to be devil's advocate, per se. If your objective is ecosystem services and that sort of thing, then that might be the best of the bunch; but if that's not your objective, then I don't think that we'd want to consider that.

MR. TERRY STOCKWELL: A somewhat related question; with the stock just barely being overfished and looking at one of the options for the MSP requiring large reductions in F with no guarantee of improved R, how much time would be needed to make the MS-VPA ready for primetime?

DR. LATOUR: Two years, probably. Here is what happens. It relies on the updated assessments for all the predators that are incorporated, so we would need an updated assessment to bring it to a common end year; say 2012, let's just say. Then we would need the updated assessment for striped bass, for weakfish and for bluefish. Then we would do the assessment material for menhaden.

It's really four assessments all happening at once, and then you also need to update the biological and ecological information. Getting it up to speed is a process and then further refining it to think about what are the thoughtful reference points you might want to derive from that analysis would require some more discussion. So, conservatively, a couple of years.

MR. HIMCHAK: I'm very sensitive to this dialogue that has been going on between the technical committee and the board for God knows how many years. Going back to fundamentals here, the very first slide you put up with the objectives, the terms of reference that the technical committee is operating under; would it not help – this is for Dr. Latour – would it not help the technical committee if this board came out with a definitive statement on are we managing for the fish, the fishery, ecological considerations and to what extent; because in the discussion of all these reference points, some are more restrictive, some are based on MSPs, some are – I can't see if the MSP relationship is 9 percent and we believe that to be inherent in the stock where we would pick a higher MSP for what purpose, and we should state our purpose up front. In other words, it would translate into a 20 percent of SSB that would be for the benefit of other than the fishery and the stock.

I understand the dilemma and this continuing dialogue, but at some point I think the board has to make a judgment call and say that we're managing menhaden for ecological considerations and we want a reserve in the SSB of X-percent so that it will support that in addition to the current fishery. Would that help the technical committee?

DR. LATOUR: Absolutely. Part of what we've experienced is a somewhat opaque viewpoint of why we're doing what we're doing because there is no clear roadmap of management goals or objectives. I think you might benefit for more comprehensive treatment of each of these goals if we knew which one was sort of the leading objective. Maybe MSP isn't the best single-species approach; maybe it is. We could consider others if that were our sole focus. We're stretched pretty thin because of the range here, so say, yes, absolutely we could benefit from that.

MR. BEAL: Pete, do you have a followup?

MR. HIMCHAK: Yes, I'd like to follow up. If the board said that – I mean, I can't understand why I would vote for a higher MSP percentage to achieve a higher SSB and lower F, et cetera, et cetera; when if we acknowledge that we wanted a 20 percent reserve of the stock, you could

factor out a fishing mortality rate that would essentially control landings to its current level and then allow for this extra ecosystem component. I mean, I would be more comfortable supporting that approach, but inherent in that approach I would have to say 20 percent or 10 percent. It's a judgment call. I think until the board makes that call we're going to make very little progress on alternative reference points.

MR. BEAL: Thank you, Pete. Keep what Pete and Rob have said in mind. The three goals that were listed in one of the early slides, I think the technical committee is definitely reaching out and asking for feedback on those goals and which course would the board – you know, what is the goal of this discussion and the new biological reference points? Lynn.

MS. LYNN FEGLEY: I just wanted to ask when this all started back in May or August one of the reasons we went down this road was because of the peer review that suggested that we needed more conservative reference points, and I'm wondering how the peer review results – their finding that our current reference points weren't conserving enough MSP factor into this analysis that you've done.

DR. LATOUR: They're completely driving it, I think. The exact figures that we – the percentages that we considered were largely a function of those discussions we've have here in past meetings, but I think this approach was precisely related to the recommendations of the peer review. Did I miss the essence of what you're getting at?

MS. FEGLEY: No, that was my question. My point to the board is that we do have two issues here. One is I think the fact that the peer review suggested that we need more conservative reference points. The other is Pete's point that the reserve of fish protein for predators, how much fish we leave in the water for predators is another call altogether, but we have a starting point where we do have a peer review that suggested that we were potentially not conserving enough MSP.

MR. DAVID SIMPSON: I think some of the key points that you made and that are made in the document, first and foremost in my mind is that recruitment really is independent of fishing, and so folks that have an expectation that if we just didn't fish as hard we would get better recruitment in the stock and would grow to the level that we saw back in the seventies and eighties, that's not likely to occur at all. I think we just have to recognize that.

The work that was done on the percent MSP, I think what it showed us was that any given level of recruitment, if you increase the percent MSP we're fishing at you get a comparatively large increase in the biomass of standing stock at a very small comparative decrease in landings. Now, the F value may drop quite a bit, but the actual landings decline is pretty modest, and so you've banked a lot of biomass that's at least available out there for – it increases the density of the prey field for predators. Some predators are very sensitive to that; others are not.

But I still believe it's a very useful currency for us to work under. It does presume that there will be assessments on a fairly regular basis to take into account recruitment so that we can set target fishing rates accordingly. Now, to me that is a time-and-effort commitment, but it's nowhere near as large as trying to keep four assessments going, including all their food habits and all those dynamics.

So it's much more of a, okay, consider recent recruitment, input that, calculate based on your target fishing rate percent MSP what the landings should be, so I think this has been very helpful to me, but I think – you know, I've said this to a number of people at different times – a big part of our job here is to manage expectations and there should be no expectation if we radically reduce fishing mortality that we're going to have any impact on recruitment at all.

If you look at the scatter plots, some of the highest recruitments came at lowest stock sizes, so it's actually a very highly Ricker-shaped function, if you will, but in practical management terms we've had periods of good recruitment. Currently we're in a period of poor recruitment, so our expectation in the next several years should probably be modest recruitment. Although I understand the '08 class is pretty good, that is what is going to drive yield up.

So, if I can summarize, if we went from a 10 percent MSP to 20 percent, any given level of recruitment will have about twice as much standing stock of menhaden biomass. That might cost us 5 or 10 percent in landings, it would appear, but a great recruitment year could mean 5 or 10 times as many menhaden; so the real magnitude shifts that everyone remembers from the seventies, that was because it was good recruitment. There was great research into what

environmental mechanisms might be behind that and so forth, but it has nothing to do with the fishery.

MR. BEAL: Thanks, David, and remember we'll try to keep just to questions for a minute and then we'll get into the discussion. Is there a question there, David, I'm sorry.

MR. SIMPSON: Well, there wasn't but I was looking for confirmation. There were comments and some of your goals were are we trying to manage to improve recruitment, so I suppose a response to my comments – it wasn't a comment but I was sort of looking for either confirmation or, no, I'm going down the wrong path from Dr. Latour.

DR. LATOUR: Yes, sure, I guess I would agree. You saw me shaking my head lot. Your interpretation was much of what the TC has discussed and what I was hoping to convey. The evidence is not strong that F impacts recruitment. That's there. Sometimes it does, sometimes it doesn't. Perhaps it's combination of lower Fs, salubrious environment conditions and any number of factors that really give you that boost in year class.

It's more complex than a direct fishery-recruitment relationship, I would agree and the TC would agree I think as well. I'm glad you brought point up about the relative costs or benefits and the MSP results. The benefits for SSB were much more or much larger by increasing the percentage on a relative scale than the loss in landings that was observed and articulated by the TC as well. I think that was it; is there one other component?

MR. GIBSON: I don't have a question, but I have advice for the technical committee and the board on this matter, but we're still in the question mode.

MR. BEAL: Go ahead and give it and we'll see where it goes.

MR. GIBSON: My take on this is it's clear to me from the scientific literature that is developing that we need to pay more attention to the so-called ecological services rather than less and less to the sustainable fishing rates for fisheries harvest. That is just towards the way the scientific literature is leading, and the recent summary paper by Terrell, Link and Mustofa I think make a pretty good case of that when they were dealing with forage species and strong predator/prey connections, such that the biomass of the predators will drive the natural mortality rates.

We should take account of those and it generally means we have to whittle down the sustainable fishing rates for the traditional fisheries. The other thing that is clear to me is that while the menhaden reference points are going to be time varying, I don't agree that the spawning biomass doesn't matter. My analysis along with Jason McNamee and my staff tells me that menhaden recruitment is a function of spawning biomass of a multi-decadal pattern and sea surface temperature – that is the AMO – and has yet identified sign function in the error structure and that could be related to predator dynamics.

So what we're going to need to do is we need to pay more attention to the ecological services component of our reference points, but they're also going to need to flux over time. They're going to change over time, in and out of high and low productivity modes, and it may be that there will be times when there is very little available yield for traditional harvesting and there may be times when there is significant yield available in the harvest.

I don't think that any fixed MSP reference points are going to get us there, but I think there is some promise in both the multispecies VPA and the Steele-Henderson type modeling to get at some of these time-varying reference points that we're going to need. That's where I'm at in my thinking right now. Thank you.

MR. JACK TRAVELSTEAD: You've laid out a number of options for us to look at, and I guess you're finished with the work on the percent MSP but still need to do more work on the Steele-Henderson model and some of those others, so what amount of time does the TC need to complete that work if that's the direction we want to head in?

DR. LATOUR: Jack, I have to admit I'm not exactly up to speed on the status of what years the striped bass assessment goes through. I know that is annual I think and weakfish is less than annual and bluefish – all those would need to be brought up to speed; rerun the analysis, recompile the ecological data, the diets, et cetera, run that analysis and then further ask the question of what types of reference points we want to derive from those outputs – one or two years, perhaps more like two. Steele-Henderson, if I could just add there, thus far its application to menhaden has been led by Vic Crecco. The TC itself hasn't had its hands on the code or the

method itself, so there is some steeper learning to go in there.

MR. BEAL: Jack, did you have a followup?

MR. TRAVELSTEAD: Yes, I guess I'm just looking for a bottom line from the technical committee. Where do you want to go with this? You don't appear to be recommending any particular reference point. You've laid out a number of them and to varying degrees they all seem to meet the three goals that you've described for us. Is your bottom line you're looking for more time to finish looking at these reference points or are you ready to recommend Option X?

DR. LATOUR: We're looking for you to tell us what your goals are. If you want single species, then MSP perhaps could provide some of that. You could think of increasing the MSP percent as a proxy for buffering. For ecosystem services it's not going to provide you with as much detail or it doesn't rely on as complex of an analysis as an MS-VPA might. I'm purposely being benign here because I want you to determine and articulate what the objectives are.

MR. TRAVELSTEAD: Are the three objectives you laid out; are they mutually exclusive? Do we have to pick one of those? It seemed to me every one of these alternatives you laid out met every one of those objectives to varying degrees.

DR. LATOUR: You can imagine each one of them appealing to those objectives in varying degrees, as you say, but each one of them doesn't equally address each objective as powerfully or as directly. If your goal is Objective 1, the MS-VPA might not be the way to go. If your goal is Objective 3, then that's probably the best of the available tools we have to address that. That doesn't say that the others can't provide some insight or can be interpreted with those objectives in mind.

MR. BEAL: Thanks, Rob. We've got a couple of more hands, but we're starting to move toward the next agenda item, which is next steps in the management and essentially where does the board want to go from here given the work that the technical committee has done and the work that they indicate that they can complete. Dr. Pierce.

DR. PIERCE: Rob, I've got a question for you. In going through the document that you've just described, the alternative reference guidance document, I find myself concluding that the technical committee is favoring the multispecies approach. So that's my first question; are you favoring – is the technical committee favoring the multispecies approach over the others? And then related to that question, if indeed we do go with that particular approach – if the board adopts that particular approach, there is an action required by the board, so my question to you would be relative to the action, if we choose that particular approach, will the technical committee be able to provide us with the kinds of analyses we would need in order for us to determine the consequences to the menhaden fishery of different predator/prey ratio, thresholds and triggers and different amounts of forage availability.

You say in that particular section that is what we're going to need to give the technical committee our goals relative to those particular factors. And if analyses are available that would enable us to again determine what the impacts would be on the menhaden fishery, it would make it easier for us to choose that approach, I suspect – make it easier for me, anyway. So, is the technical committee favoring that particular approach, the third approach, and would there be any analyses available for us to assess the consequences of that approach on the menhaden fishery itself?

DR. LATOUR: The TC is not favoring any approach. We've laid these out because these are what we interpret supporting the objectives. If you tell us an objective, then we'll give you which one we think is the best. For example, if you chose Objective 3, we would probably say as the TC MS-VPA is the best way of looking at that; again, not to be mutually exclusive to the others.

At this point we're not favoring any particular approach because we feel like we don't know exactly what the objectives are for managing the resource. The second part of the question is, yes, those would be precisely the analyses that we would generate from the MS-VPA if we in a sense got the proverbial go ahead with that being the way in which the board wants to go.

DR. PIERCE: Thank you. You haven't stated an approach. The technical committee hasn't taken a position on the best approach, but it sounds to me from what I've read here and from what you said that that would be the easiest approach for the technical committee to use

based upon the data that it has available for analyses.

DR. LATOUR: It's probably actually the most difficult and most complex, but it's probably the most appropriate for the ecosystem service question. Suffice it to say this is a forage fish by definition and it's providing ecosystem services so it inherently falls into that category which makes us want to consider it in that modality, if you will.

So if you asked us pointblank if we want to manage for ecosystem services along with fisheries harvest, then the MS-VPA would be the most – it's the most advanced of the methods available to us to provide that guidance. Again, that doesn't say that we couldn't get there in a less technical way with some of the other methods.

DR. PIERCE: Okay, thank you, and one final question related to the second approach, the abundance-based approach. I admit I'm a bit confused about the conclusion of the technical committee relative to the Butterworth and Redemeyer report and the analyses they offer up as a suggested approach related to abundance based.

Here you say on Page 3 of the document that you've reviewed the approach and you determined that it could serve as a viable tool for preventing recruitment failure and could be adjusted to reflect desire management objectives. What I'm confused about is I didn't – well, has that particular approach been peer reviewed; is it a viable approach?

The technical committee feels that the Butterworth and Redemeyer approach and recommendations are valid – that's my question; are they valid; is it really an option that this board can consider?

DR. LATOUR: I'll just give you what I know about it. Doug Butterworth has used it extensively in his home ground. It apparently has frequent use in other fisheries in other countries. We as the TC reviewed it and could not reject it on a technical basis. It was fine; he did a lot work. It comes from a logical framework that basically says let's tie our reference points to the observations themselves rather than model outputs, so he is actually tying the reference points to the estimated abundance indices of age zeros.

Superimposing that is our thought that if you elected to use that approach, then you'd be focusing on recruitment and it would give you perhaps the best metric in preventing recruitment failure or at least a decent one, but you'd be doing that ignoring in your reference point framework what is happening with the SSB or the adults.

Again, that's a decision to make on how you want to manage the resource, but in terms of its technical merit it seems fine to us. I don't know if it has been through a SEDAR-like or SAW/SARC-like peer review, but I couldn't find anything to reject it.

MR. BEAL: Thank you. I've got three more speakers for questions of Rob, hopefully, and after that I'm going to ask Toni to go over a couple of slides that will hopefully focus this conversation and get back to the goals that Rob introduced at the beginning of his presentation. I think we've got a bit of a chicken and the egg discussion going on here.

The technical committee is asking the board for clarifications on what they hope to get out of new reference points and the board is asking the technical committee what approach do they recommend. Hopefully we can get at that with some of the clarifications of these goals. Pat Augustine.

MR. AUGUSTINE: Rob, can we get the first slide back up on your three goals, the ones that you were identifying as which way we can go and which would be of most value. My concern is that we're still doing single-species management, the exercise that has been going on in the Chesapeake for four or five years now, and looking at the predator-prey relationship and what each of those species of fish are eating have been brought up every year, and we still haven't come to a conclusion – I don't think we have – as to what really is causing the increase and decline or availability of bunker other than the points that you've brought out.

You had indicated that there is not a direct tie between SSB and the juvenile abundance. You say it's eco-based, if you will, biologically based, so it seems to me the board has to make a decision are we really going to embrace the new tool, which appears to have some very viable data being made available, but at the same time we're still stuck in single-species management.

The simplest of all of those, needless to say, would be stay with \Goal, which is increase abundance in SSB for the benefit of the stock and however we get there, we get there. You did indicated in the other cases, when you get into

the MSP approach, there are some complications although the final product may be better – better in what regard. Again, until we address the basic problem that you're describing or you described as the issue, the biological part, habitat, if you will, and its relationship to recruitment, boy, it's awful difficult to just say, well, let's go to the new way because it sounds like the right thing to do.

On the other hand, I hate to use the work or the phrase "politically correct", it would be politically correct to take in all the forage species. I know there has been movement – and I think Mr. Ken Hinman has done an outstanding job of presenting the issues on all the councils and on this board the value and importance of forage species – and menhaden being one of those – but based on what we're dealing with right now and where we are, the stock is on the borderline of being overfished. I think that's the issue we have to deal with.

Evidence that you've shown so far sure don't point out a real strong case for doing anything other than just remain as a single species and do it as directly as you can. Now, that's my humble opinion and I may be way off base, but if I am please tell me.

DR. LATOUR: Much of what we've done here wasn't designed to establish the value of the resource from an ecological perspective, so that's probably why you don't see that in an overwhelming way. I don't mean to downplay its role in that regard. I agree that – I guess one point of clarification is that we've talked a lot about the stock-recruitment relationship. One may exist in nature.

Our observations to this point don't give us a handle on understanding that relationship, so just keep that in mind, too. Our conclusion that it's environmentally driven is sort of our best interpretation of what we have in front of us; what else could it be, so to speak? If it's not fishing and if it's not abundance, then it's the catchall. That doesn't mean that one physically doesn't exist in this stock. It's just we don't have observations that give us indications that we know what it is. I can't remember if there was anything else I needed to respond to.

MR. AUGUSTINE: That was great; you clarified it in my mind. Thank you very much.

MR. G. RITCHIE WHITE: The multispecies approach is certainly intriguing to me, but waiting two years is not. Do you see any short-term or long-term ability to put two of these together; so doing something now with the idea that we work towards the multispecies or does that create too much work for the technical committee?

DR. LATOUR: The Fmed and the fecundity median reference points from the original assessment were strictly fishery-based single species. You have before you the peer review's recommendation to suggest tying it back to some measure of virgin stock abundance or fecundity. That's what the MSPs do. It gives you that reference or benchmark to virgin conditions.

While there isn't clear evidence in the literature that I'm aware of that says a clupeid like menhaden should be managed at 8, 10, 20 or 30 percent MPS, those estimates are all over the place for the herring family from the papers I've seen. Suffice it to say that as you increased MSP, you would be in theory buffering against or buffering for ecosystem services.

You'd be providing in theory more spawning stock biomass that would presumably go to those ecosystem services. I've put caveats in here because I don't want you to think it's really just an on/off switch. Providing more biomass doesn't necessarily mean healthier conditions of our predators. There is more to it than that. It doesn't mean more recruitment; there is more to it than that, but it would certainly embrace that philosophy.

So, I guess to get to your question, the MS-VPA approach might be the most optimal because it's the most data intensive, it's the most analytically appealing for the academic side of this exercise, but that doesn't mean to say that some of these others couldn't offer as intermediate proxies.

MR. R. WHITE: So if we did select an MSP approach for the next few years, the technical committee would have the ability then to work towards the multispecies during that time and at some point we could switch to that if we so desired.

DR. LATOUR: Presumably, yes. From a guidance point of view, that would focus our workload. I mean, we've got a new assessment coming up in 2012, so we'll have to trigger that, but the MSTC could then, instead of exploring all possible approaches to derive ecosystem reference points, they could harness in on the MS-VPA and the Steele-Henderson, so it would be helpful in that regard.

MS. FEGLEY: Mr. Chairman, I have a two-part question. The first is I seem to remember you, Rob, cautioning that the MS-VPA in the peer review was not – they recommended that it should not be used for management, and I wondered if you can update us and kind of brief us on how that affects any approach we might take.

DR. LATOUR: That is true, but the peer review was in 2005, if I'm not mistaken. We're five years more into data collection. I was kind of looking at Toni when some of the MS-VPA questions were coming up because in my mind it sorts of seems like it's time for a new peer review.

If we're going to go ahead and say we want to use this for management, I would recommend that happen and build that into the process. It would still take some time but we could perhaps – these updates could be more in line with getting it ready for management rather than sort of the expiration type analyses which has been used to this point.

NEXT STEPS MR. BEAL: All right, with that we'll go ahead and I'll ask Toni to give her presentation. Hopefully we'll shift gears from the technical committee report to the part of the meeting kind of where do we go from here, what should the next steps be?

DISCUSSION OF NEXT STEPS FOR POSSIBLE MANAGEMENT ACTION

MS. KERNS: Dr. Daniel had asked that I provide the board with an overview of what has been going on with the bait fishery in the recent years. This graph just gives an indication of our overall bait harvest by region. This is through 2009. The 2010 bait harvest was not available yet. The overall bait harvest was down 20 percent from 2008. It was down 1.2 percent from the previous five years' average.

The largest decrease was seen in New England. The Chesapeake Bay Region landings were down but still the highest of all the regions. The South Atlantic was the only region with an increase. As Rob has indicated before, what the technical committee is looking for is guidance on what is the management objective of the board so that the TC can provide better advice to the board in moving forward.

For the next steps for the board is the question once you establish what goal it is that you're trying to achieve, then we can move forward with either we're going to keep the status quo reference points which indicates that overfishing is occurring but we're not overfished or we can have a new approach for reference points, either be the MSP approach, abundance-based or multispecies-based approach or a combination of those.

We would need to move forward with an adoption of an addendum if we were to move forward with a new reference point. And then after we establish a reference point, then if we need to make changes in management we'll need tools to achieve those changes. Currently we don't have any coast-wide management tools; so if you implement any changes in management, we would need to do an addendum to implement any measures. Those are my few slides.

At the November board meeting we tabled a motion and that motion read "move to allow the technical committee to complete its work on the reference point alternatives and report to the board at the August meeting, at which point an addendum could be initiated". The motion was by Mr. Travelstead and seconded by Mr. Augustine. That motion was tabled to this meeting.

MR. BEAL: Thank you, Toni. Just as a reminder, my recollection is that motion was tabled to this meeting to allow the technical committee to do their work. There was some concern at the meeting that this board would not take action on an addendum until – or this motion, if it was approved, would prevent the board from taking action at this meeting to initiate an addendum.

This motion is obviously still in play should someone decide to take it from the table for consideration today. Also, if the board is going to ask the technical committee for additional work, I think the technical committee obviously and clearly has asked for more guidance between the three goals and a weighting of some sort between those goals as to what the board would like to achieve with new reference points. Mr. Travelstead.

MR. TRAVELSTEAD: First as to the tabled motion, I think it has gone by the wayside and probably doesn't need to be brought back up. I think we can move forward today. I would like to offer a motion to get us started, but before I do let me just offer some thoughts. I think the multispecies approach appears to be the best way to go.

I think Goal 3 of the three goals that were laid out is probably where we need to focus our efforts over the next couple of years, but I'm also worried about recruitment in the stock. We've heard a lot of that over the years and know that recruitment has not been what it should be for quite a while now.

I guess I'd like to offer a motion to do two things; first, to direct the TC to proceed with its work on the multispecies approach as a priority; and, secondly, I'd like to know more about recruitment. Right now this board doesn't get annual information on recruitment, and I think that's information that we should have.

I'm wondering if the TC couldn't also, on an annual basis, provide us with an update on the recruitment indices and use that as further guidance if we need to take immediate action while the TC is working on the multispecies approach. **My motion again is to direct the TC to proceed with work on the multispecies approach as a priority and to prepare and present annual recruitment information to the board**.

MR. BEAL: As the staff polishes that one up, we'll get it in front of you. Is there a second to that motion before we have a discussion? Bill Cole, thank you. Discussion on the motion by Mr. Travelstead? Dr. Pierce.

DR. PIERCE: Just a clarification, Jack, if you would. I think what you're saying is that the board guidance to the technical committee will be focused on Goal 3 – I'm sorry, on Approach Number 3, and the first and second approaches would not command any attention by them. I'm a bit confused as to how you are responding to the first two approaches; the maximum spawning potential and the abundance-based approach. It sounds like you're silent on those two particular approaches and you're saying go with Approach 3. If that's your intent, then –

MR. TRAVELSTEAD: Well, I'm not saying the technical committee shouldn't ignore those and give up on them, but they've asked for guidance from the board and the direction that they should head, and I think it's the multispecies approach. That's where they should be spending their time and get those results back to us as soon as they can. In the meantime I think we continue with what we have along with the recruitment information that we need to see.

DR. LATOUR: The MSP stuff is routine output from the assessment model in its current configuration so providing you that information is not difficult. We had to configure the projections from ground zero more or less, so there was some involvement there, but the MSP numbers in that table are routine output so those can be provided if that's of interest.

MR. BEAL: Jack, just one comment on the motion; this appears to have some multispecies work that needs to be done, obviously, should this pass, and I think really some of the charge would be to the Multispecies Technical Committee as well as the Menhaden Technical Committee it is handled by both groups.

Kind of switching hats and going back to the staff role, the Multispecies Technical Committee is tasked by the Policy Board so this may be something that needs to be brought up actually at the – a motion to recommend that the Policy Board charge the Multispecies Technical Committee and the Menhaden Technical Committee with this work. It's just kind of a nuance and a process thing.

MR. TRAVELSTEAD: Yes, that's fine with me, I don't have any problem with that.

MR. THOMAS FOTE: We've been dealing with the menhaden issue for a long time. Recruitment has been bad. For the last 20 years we haven't seen a good recruitment. We have not seen menhaden in historical areas where they were up in New England all the way through and the numbers they were back in the fifties in a long time.

My fear is with this motion we are just postponing again until we basically start doing multispecies, which we have been waiting for quite a few years now, so basically it's just to postpone with doing anything. I'm not comfortable with that. I mean, we've been waiting to rebuild this stock. You know, we look at age class distribution and we're still basically seeing no fives and sixes and sevens and eights and nines.

Unlike the Gulf, the menhaden on the east coat will grow many years, and we don't see that in the age class distribution like we basically demand in all the other fisheries. It seems we basically treat menhaden special. We don't do that. I don't see us moving ahead. I mean, I just look at this year and we've been studying this to death without doing any action to make sure

these stocks come back. I have real concerns with what we're doing right now.

DR. PIERCE: Sorry, Jack, just one more clarification. In light of what you said in response to my first question, it sounds like perhaps implicit with this motion is your desire to stay at status quo MSP, which is the 9 percent MSP? Is that a correct interpretation of your intent?

MR. TRAVELSTEAD: Yes.

MR. BEAL: I think, Jack, technically we don't have an MSP reference point right now, but it would be maintain the current reference points? Okay.

MR. STOCKWELL: I'm comfortable with this motion. It provides a positive step forward. It provides stability for the current industry. It addresses the overfishing issue. My earlier question about the time; I mean, two years, much of the work is already done. It's not a long time period. I think that it will fall together quickly without completely unsettling the fishery and the industry. I don't think the 0.001 is an issue that we need to fall on a sword over at this point.

MS. FEGLEY: My concern about this motion is that in order for the Multispecies Technical Committee to do this work, we still need to address the action; that is, it's stated that the board will need to quantify its goals for establishing predator/prey ratio threshold or triggers, so that means that the board is still going to have to get in the business of really directing the Multispecies Technical Committee specifically to how we think we want this ecosystem issue addressed.

The other thing about the MS-VPA that we haven't talked about is this notion that the technical committee states that it's available for a management strategy evaluation, which is the process, when you get into this business of really a judgment call of how much stock do we preserve for forage, is a perfect tool for addressing that.

We pair that with the fact that we have in front of us a peer review that very clearly counseled that we are likely not protecting enough spawning stock. We turn to the goals laid out in Amendment 1 to the Fishery's Management Plan that we should be protecting the ecosystem role of menhaden. It seems that all of this puts a process in front of us where maybe we should consider initiating an addendum that allows us to acknowledge the peer review's concern that puts out for public comment a range of more conservative reference points.

And then as that is going on, we can maybe have the Policy Board start to consider how we would go about a management strategy evaluation process to help guide the MSTC on how to really work this model to our advantage and work these ecosystem issues so we're not disadvantaging one sector or the other by a judgment call. Thank you.

MR. BEAL: Rob, do you have a comment on that?

DR. LATOUR: Yes, I just want to make you aware of an analytical wrinkle that just occurred to me. The MS-VPA in its own right can be used as the assessment tool for menhaden. It is what it is. It's a virtual population analysis, which is an age-structure approach that used to be used for menhaden years ago in a single-species context. The Beaufort Team has moved away from that VPA approach to a statistical catch-at-age model, which is far more attractive if I had to weigh the two or far more analytically flexible if I had to weigh the two, so we have some incongruence in the analytical machinery.

That doesn't preclude that they can't both be operating side by side and it doesn't preclude that you can't use one for reference points and the other for assessments, but there is a little bit of ambiguity there, in my mind, how that would play out. It's not the optimal design, I guess, is the way I would play it.

Usually you have an assessment model, you have an internal calculation of the reference points. Your stock status comes directly out of it and you proceed. Here we would have the assessment model, the Beaufort approach, we have the MS-VPA approach, they're kind of working in tandem but yet in competition.

I just want to bring that to your attention that you're leaving behind a decade of single-species modifications to the assessment in favor of the multispecies VPA, which may be okay and it may be fine. I just want to make you aware of that, that there is a transition that would have to occur in terms of the machinery used for the assessment.

MR. WILLIAM GOLDSBOROUGH: I wanted to sort of echo the big picture view that I was

hearing from Lynn. With respect to this motion, first it seems to me that in substance it sketches out a reasonable direction but one for the longer term. I think we need to keep in mind the context we've been dealing with over the last year of there being potential long-term and a short-term avenues for this board in response to the assessment.

Two years to further develop the MS-VPA for application to management up to two more years we know are possible for implementation on the ground are important considerations. Keep in mind that last May, when we first heard the assessment report, this board was concerned enough with the peer review recommending that we develop new reference points, expressing alarm that the spawning potential was down below 10 percent, and that that ought to be increased, the finding of the assessment that the stock was at the lowest point in the time series, et cetera, that this board voted unanimously to begin the development of comprehensive ecologically based reference points and asked for a response on progress to that at the next meeting, last August.

At that time we found that little progress had been made in part because this is a lot to wrap our arms around. In response to the concerns that we had from the assessment and the peer review, we at that time passed another motion unanimously for what in effect would be an interim action while those broader ecologically based approaches were being evaluated.

I think we find ourselves still in that circumstance. In fact at the November meeting we had on our agenda originally the task of reviewing a draft addendum for identifying and implementing percent MSP-based reference points. That was pushed off that agenda, if you recall, because a week before the meeting an error in the code was found and we felt that needed to be cleared up before took significant management action.

Now we find ourselves at the next meeting and that has been done, and now the assessment actually compels action more than it did before. We passed two unanimous motions when the assessment said the stock was not overfished and overfishing was not occurring simply because of the substantive findings of the assessment and the recommendations of the peer review. Now the official result, whether it's statistically above or below, the formal assessment result is that overfishing is occurring by our protocols, so we're even more compelled to take action in the shorter term.

I think what we've heard today is that the percent MSP approach is ready for primetime and is highly viable as an interim actions and that married with over the longer term an MS-VPA based approach consistent with the May motion that we first passed makes a lot of sense. I think this motion is fine if it's adopted in that context, with that understanding that this is the longer-term strategy that we're adopting and we have yet in this meeting to discuss what we might do in the shorter term.

MR. GROUT: Mr. Chairman, I just had a quick question for Rob. Part 2 of that motion, the technical committee could provide for us every year the recruitment information, there is no problem with that. I agree with some of the previous speakers, also, that we need to also have an interim approach here. I fully agree with Jack that the long-term direction we need to go in is to try and see if we can utilize the MS-VPA for a management approach.

Based on Rob's comment that this is going to take two years to provide, I also think it will take at least another year to implement a management approach to it. I think what this motion needs is what we're going to do in the interim**. I'm going to make a motion to amend to add a Part 3; that we utilize the goal of increasing abundance in spawning stock biomass and initiate an addendum to implement an interim reference point that would be a 15 percent MSP level.**

MR. BEAL: Is there a second to Doug's motion to amend? Roy Miller. Comments on the motion to amend? Pete.

MR. HIMCHAK: This pertains to both the original measure and interim measures that the states may be required to take. I bring this up because of the first slide that Toni put up on the bait landings. The bait landings – there is a cap on reduction landings in Chesapeake Bay, we all know that. The bait landings have historically gone from about 6 to 8 percent of the total Atlantic coastal landings to the point where they are now between 20 and 25 percent of the total coast-wide landings.

If you're going to talk about reductions based on increasing the MSP, the states that have significant bait fisheries – and typically they're taking older fish, three years and older – they're going to be impacted by these interim measures.

New Jersey in particular; we have a rather significant purse seine bait fishery and they typically catch three-year-old fish, which is what the recreational fishermen want for crab bait, et cetera, et cetera. I just wanted to make everybody be cognizant of the fact that is a major part of the equation here and not to forget the bait landings.

MR. GIBSON: I was going to support the prior motion as long as others said it was a clear long-term objective and then wanted to speak to the short term, and now Doug has taken care of that. I think this is the proper way to go. Again, the weight of evidence in the literature is telling me that less mortality for directed fishing and more for functionality in the marine food system, the food chain, and I don't see that that is going to be any different here, so I think it's wise for us to take a nibble now and wait for the longer-term approaches to develop. I think what Dr. Latour just said about the statistical catch-at-age model and the VPA is important and that will slow them down a bit, and I think we need to do something in the interim. Thanks.

MR. BEAL: I'll go to Jack Travelstead in a second, but I think as there is more debate here, I think the timeline or exactly what is meant by initiate an addendum may be something the board should talk about; what are the expectations of draft documents and approval by the board and those sorts of things. Jack Travelstead.

MR. TRAVELSTEAD: Just a question for Dr. Latour; if he could compare and contrast what would happen to the status of the stock under the proposed amendment versus status quo for the next two years while you're working on the multispecies approach; what you believe would change about the status of the stock; status quo versus a 15 percent MSP?

DR. LATOUR: Two years is hard to see a major effect because that is only two year classes, right, so we're not going to see it matriculating into the mature spawning stock biomass under a two-year timeframe. The expectation is that the spawning stock biomass would increase over time. The weight of evidence is suggesting that. It is suggesting that the landings would definitely decrease but perhaps proportionately speaking not as much. I can't guarantee it's going to happen, but it is certainly what the collective information suggests at this point.

MR. TRAVELSTEAD: Just to followup; is the stock in danger? I mean, is something going to happen drastic in the next two years? I guess the terminal year of 2008 we were technically overfishing by some miniscule amount, but overfishing wasn't occurring for ten years prior to that; nine years prior to that. That was the terminal year and we don't even know what has happened in 2009 or 2010 although anecdotal reports suggests there has been better recruitment and more fish around.

DR. LATOUR: The assessment tells us that overfishing has only occurred in the last year within the last ten, so the '08 year of the last eight or nine, I should say, so there is a concern that we're at or near the target all the time on the overfishing side of it. You could argue that's problematic or you could argue it's a function of the data and the modeling that gives us widely varying Fs.

The other side of it is the overfished category, and we seem to be very healthy there or right around the target. So from a sheer pragmatic point of view, two years isn't going to collapse the stock if our measure of overfished is in fact a healthy one. What it boils down to is I believe do you want to place value on leaving more menhaden in the water for their services and not optimizing yield. That's the separation.

If we stay with status quo, maybe reduce F a little bit, we could be handling the single-species approach quite well. The question is does that leave a negative ramification for the ecosystem or does that provide one, and those are much more secondary or tertiary level effects that are not easily observable, so decades can go by before we fully understand.

It's a difficult question to wrestle with and I don't envy your position. I guess that's just my view on it. It's placing value at some basic level. Is the value for the fishery alone or is it the fishery with some residual or reserve for ecosystem service?

DR. PIERCE: Doug has included in the motion specific reference to Goal 1 and I agree with him that is the proper way to proceed and specific to this choice – that is the 15 percent MSP level, increasing it from status quo of 9 to 15 percent – we do get some additional benefit from doing that as noted in the document.

It says it may address Goal 2 relative to recruitment, and what is more important for me is that it also may address Goal Number 3, which is the ecosystem service end of it where I think a

great deal of attention needs to placed, which is why, of course, I support moving forward with the third approach as a priority.

What will help me evaluate the consequences of this particular motion, if it passes, will be reference to a slide you showed earlier on in your presentation, Rob. At least I think you had this information in your slide where you showed what the differences in fishing mortality would be, that we would have to achieve with the 9 percent versus the 15 percent versus the 25 versus the 40 percent.

Would you please, Mr. Chair, if it's all right with you, would it be possible to show that information again so we would see the level of fishing mortality reduction we would be faced with – notably the industry would be faced with if we move from the 9 percent to the 15 percent quickly and then, of course, wait for the third approach to bear fruit.

MR. BEAL: David, I believe that slide is back up on the screen right now.

DR. LATOUR: As measured through the currency of F, it's a sizeable decrease; but I think as we discussed earlier as measured through currency of landings, it may – I mean, I don't want to speak for industry, but if a 5 percent decrease is a lot, then it's a lot and tell me otherwise, but on the order of 5 to 10 percent decrease in landings whereas we're looking at 50 percent decrease in F, so there is not a one-to one relationship.

There is also a challenge. The stock projections indicated a challenge associated with getting – the constant harvest policy does not always yield the appropriate associated F in the projections. There was some trouble – the model had trouble doing that, which is more underlying in this concept that an F-based approach may not be the best. However, these are the reductions; this would be the strategy you would be adopting. The TC favored the most recent shorter term period so it would be going from a 2.2 to a 1.4 in F, and then we have the calculated associated decline in landings.

MR. BEAL: Does that answer your question, David?

DR. PIERCE: Yes, going from an F rate of 2.2 to 1.4 if we go up to the 15 percent on the MSP; could you translate that into percent annual removal as opposed to these instantaneous rates that don't have much meaning?

DR. LATOUR: So it would be the right-hand bar graph. You can pick either the red or the blue, but the left hand is normalized – or, sorry, the left-hand most bars are normalized to 1. Everything is referencing the current status quo of 9 percent, so the one exactly to the right is the 15 percent level. I could pick the numbers off the spreadsheet if you give me a chance, but it looks like less than 10 percent or maybe at most a 10 percent reduction in landings.,

DR. PIERCE: At the most a 10 percent reduction in landings would occur if we go up to the 15 percent MSP from your quick look-see, which I appreciated. All right, thank you.

MR. RUSSELL DIZE: Mr. Chairman, I'd just like to ask the technical committee a couple of questions. We're talking about 0.004; are we not for the overfishing?

DR. LATOUR: 0.005.

MR. DIZE: Five, okay.

DR. LATOUR: So, yes, it's miniscule.

MR. DIZE: Can you translate that to pounds, tons, metric tons?

DR. LATOUR: I could if I had a few minutes, but it's not going to be a lot. It requires a few basic calculations.

MR. DIZE: So we've been listening an hour to this miniscule amount. Thank you, Mr. Chairman.

MR. GOLDSBOROUGH: I just wanted to make a couple of points in response to some things that I've heard. With respect to the finding that overfishing is occurring in the terminal year 2008 and seeing none in the last eight or nine years, I think it was, of course, the full story out of the assessment is that 32 years out of the 54-year time series we have exceeded a threshold, and that's with the current threshold.

We have been apprised of the fact that the fishery has essentially continued in the same mode, so really it's the fishery as currently being prosecuted that has a history of exceeding that threshold that we need to concern ourselves with. And then there is the recommendation from the peer review that we need more conservative reference points to better protect the stock.

I make that point also in connection with the fecundity reference point and the suggestion that since the stock is not overfished, quote-unquote, relative to that threshold, that perhaps we would use the word healthy to describe the stock. The peer review panel, of course, had a little different take on it and were alarmed at the spawning potential that the stock now has and suggested greater protection for the stock, more conservative reference points to boost that number. Thank you.

MR. BEAL: Thank you, Bill. I think we're very quickly approaching the point of debate where the opinions and positions of board members are not going to be changed very much by additional debate. With that, I've got Pete Himchak, and I think at the outset of the meeting I said the public would get a chance to quickly comment on motions, so I will do that as quickly as possible.

MR. HIMCHAK: You know, I hate to keep beating this bait drum too often, but in these interim measures it would appear that you would need some kind of cap on the bait landings because just in 2010, with the lower TAL for Atlantic herring, the bait landings may have been increasing substantially in 2010 to fill the void for lobster bait. Again, it's another complicating factor in how are you going to keep the interim measures from controlling the fishery until you get through MS-VPA.

MR. BEAL: Well, Pete, just a process comment; I think it's a two-part question. One is what are the new reference points that the board chooses to change those reference points, and then the next question is how do they get there? Is it caps, quotas, seasons; I don't know what it may be. With that, are there other comments around the table? Jack Travelstead.

MR. TRAVELSTEAD: Before you go to the public, you mentioned timeframe, timing of doing an addendum; I wonder if you could take us through that. My point would be based on what I think you're going to say is you might be two years away to actually putting something on the ground if this amendment goes forward, in which case it becomes a moot point.

MR. BEAL: It's up to the board, but obviously the next scheduled meeting of the commission is in August of this year; so unless some interim approach is taken to develop and approve an addendum for public comment, August would be the next opportunity for this board to take action on the document.

The boards in the past have done things such as fax polls and other ways of approving documents in between meetings, and that's something the board can discuss. If a document is not approved for public comment until the August meeting, the final approval would – the first opportunity there, again unless there is a special meeting, would be the annual meeting in November. Jack.

MR. TRAVELSTEAD: Okay, but at that point you will have adopted a reference point; how do you put that to work on the ground? Don't you then have to come back and decide what kind of management measures you need to implement that and how are you going to reduce catch, quotas, allocations. That's going to take time. Then you've got to go to your legislatures to get all of that implemented. I'm thinking two years down the road we might have something actually on the books.

MR. BEAL: I guess the cynical answer is that's what the Lobster Board has been wrestling with for a long time. They came up with a new reference point and now they're working on how to get there, and that's not an easy thing to do for the Lobster Board. I'm not trying to minimize the decisions they have to make, but it can be a lengthy process. Terry.

MR. STOCKWELL: I'll be brief. I appreciate Doug's motion here to get a short-term motion in place, but I'm looking at the 15 percent MSP and just hearing is a 10 percent reduction in landings, and that's way overkill for overfishing of 0.005. Is the TC able to come up with another percentage that would address the overfishing without having such a drastic impact?

DR. LATOUR: I mean, sure, if your goal is to bring it down to reduce F by 0.005, there exists a number that will do that. Are we revolving and holding on that tightly to the threshold?

MR. STOCKWELL: No, my point was if we're going on a long-term – if the long-term goal is to go to ecosystem management, which I actually strongly support, we're going to make significant changes that impact industry and take up a lot of our time over the next year and a half, two years and impede our momentum and movement towards ecosystem management.

DR. LATOUR: Sure, I didn't mean to trivialize your comment. You have to pick a number. If

you want to get just below the threshold, there exists that number. I can't give it to you right now, but we could tell you shortly, so decide on a number. One comment on the two-year timeline; the more I think about it we start, according to the schedule, a new assessment for menhaden next year.

It is not a benchmark; it is a turn of the crank, which means we're bound analytically to be more or less the same as what we were the last time. Bob can perhaps comment on process here; but even if the MS-VPA were up and running in two years, I don't know how it would meld with the current assessment cycle and thus assistance with management for menhaden.

My feeling is it may take longer; so if the thought is it takes two years to do the interim – maybe that's true, but my guess is it will take a lot longer to get to a multispecies-based approach using a multispecies tool. The research side of me says that we may want to do some analytical development along the way, too, to improve upon what we have, so that always takes more time.

The more I think about it, the more the two years may not be – that may be optimistic and not conservative.

MR. GROUT: Mr. Chairman, just to be clear, my point with this motion was not necessarily to get our fishing mortality rate below the threshold there. I think we could do that already. The point of this motion was that we've taken a long-term direction of going to MS-VPA management and to explore that and try and get something like that in place, which I feel is an ideal scenario and I think a lot of the board members feel that way, this was an interim-based response to the peer review recommendation that we use more conservative reference points at this point to take into consideration some of the predator/prey – the predator needs out there.

It's a small step. It may be all we ever need in that direction as far as an increase in the reference points, but at least it's getting us started on this. I'm also looking at it from the standpoint that this management action will take a couple of months. Once we get to the point of putting together the MS-VPA so it's ready to go, then it's going to take another management action that could take a few more months to get in place, too, so I'm still looking for at least a two-year timeframe that we're going to be doing something where without this action we won't be doing anything for another two or three years.

MR. SIMPSON: I wanted to speak in favor of the amendment that Doug offered. I think this is a very important first step for the commission to explicitly recognize the need to serve that forage function; and going from roughly 10 percent, 9 percent, 10 percent to 15 as one of the other figures will show is about a 50 percent increase in SSB given the same level of recruitment, so that's a major improvement in the volume of menhaden that's out there for ecosystem function at a cost of about 10 percent in yield to the fishery, so that's a pretty good buy.

I think it's a very important and very measured first step. When we asked the technical committee to do this work, we considered all the way up to 40 percent. That would be world-changing, but I think this is a great amendment and I think this is the way the commission needs to go.

MR. BEAL: Thank you, David. With that, I go back to my point where I was a couple of minutes ago that I don't think further debate at the table is going to change anyone's mind. Public comment; there are a couple of hands in the back. Keep in mind, before we get to that, if this amendment goes forward and becomes part of the main motion and then that's carried forward, it is a motion to initiate an addendum.

There is going to be plenty of public comment opportunities through the addendum process. It's going to have to come back to this board for an approval before it even goes out to public hearing. We are behind schedule and I would just like to keep all comments as brief as possible from the audience and limit your comments to two minutes, if you can, and that would appreciated. With that, I see Ken Hinman.

MR. KEN HINMAN: Mr. Chairman, I will try to keep this brief. I would just reiterate all the points that I think have led you to this motion; the discussions about ecological reference points and the MS-VPA. As somebody who has been coming to you for probably eight or nine years now asking for those, I'm certainly in support of that, but I think recognizing that you're probably talking three, four, maybe more years of actually getting those implemented with management actions, interim action is absolutely required.

On that point and on this motion I would just point out a couple of things. The original motion

last August was inspired obviously by the peer review panel's recommendation that you needed much more conservative reference points; and since then we now know that overfishing is occurring. On overfishing, I'm a little bit disturbed to hear people acting like we just need to make a minor adjustment in fishing mortality as if the threshold were the target.

We are a long way from the current fishing mortality target. We're talking about making a minor adjustment so that we're just on the other side of the threshold. The threshold is bad; it's something to be avoided. It's a signal that we need to take significant action to get back up towards the target.

As far as this motion is concerned, I am troubled also that there is only one option really being offered in this addendum. The original motion from last August contained a range of MSPs that really does cover the ranges that are used in other fisheries for significant prey species, including members of the herring family. They are below this, but they are also significantly above even the 40 percent that was in the original motion.

It seems to me you're getting ahead of yourselves by just limiting this addendum to one option, 15 percent MSP, and pretty much denying the public and others to comment and review and recommend where that percent MSP should be. I just wanted to make on final comment on the spawning-recruit relationship.

I don't have a degree in fishery stock assessments, but I have been dealing with them for 32 years, and I think I've earned at least maybe a badge for my lapel for at least attending these meetings. I think I've learned that the spawning-recruit relationship is not so simple and to just say that there is no relationship here is not the case.

I think coincidental with the low recruitment in this fishery we have seen a spawning stock biomass that has gotten to its lowest point in history. We have an exploitation rate on the 3-plus fish, the spawning fish, that is 60 to 70 percent, meaning that most of those fish only get a chance to spawn once.

We have, as a result of the history of fishing, a truncated population in age that Tom Fote mentioned earlier where we don't have a lot of those older spawners out there. Everyone knows in fishery science that the older fish produce more eggs, more viable eggs. They produce them over a longer period of time both in the season and throughout their lifetime. They produce them more geographically. Having more of that spawning stock out there, when you have good environmental conditions for menhaden recruitment, you will get a big bang for your buck by having more of those fish out there, not less. Thank you.

MR. SHAUN M. GEHAN: My name is Shaun Gehan. I'm with Kelley, Drye & Warren. I'm representing Omega Protein. I'm just going to speak to all the elements. I mean, I don't know if you're going to go around again. But, you know, critically important, the annual update of recruitment indices – you know, when we hear things about the lowest abundance, well, for one, we're at our fecundity target so I can't square the two.

But also it's the terminal year, it is most uncertain, and actually the menhaden plan can be read to require an annual update of the recruitment indices, hopefully tuned by the catch-at-age information, so we have an ongoing sense of where the stock is. In terms of the multispecies approach, it's hard to say, I'm not a technical expert, but I don't think that as we go down that road – if we go down that road – you can leave optimum yield out of the equation entirely.

I mean, there is a historic industry that has developed around this fishery. It was initiated in 1811 and current landings are about at the same level as 1875. We have been at and above those levels for almost 130 years. That's scores of generations of menhaden and many different ecological regimes.

I think that gets at Jack's point; are we really on the threshold of a crisis and we need to jump at something immediately? Again, I'm pleased to see ecosystem considerations but don't forget the fishery itself. And, finally, I agree with Ken Hinman. Although he didn't put numbers on it and he probably wouldn't agree with mine, but as I understand it Dr. Latour had given us a range of MSP. I don't know; was that the entire time series, was that 25 years?

DR. LATOUR: They were calculated in two different ways; one based on inputs from natural mortality and fecundities across the entire time series and then a secondary, just the last five years. They didn't actually differ that much.

MR. GEHAN: Right, and it was 9 to 15 percent. I don't think the recent stock assessment report has the MSP values going back to '55 at the

beginning of the time series, but Amendment 1 did, and 9 to 15 percent is pretty much the range it has been in those great years in the eighties. The peak was about 23 or 24 percent MSP; that was 1960. That's that huge spike. It was the spike in landings, it was the spike in recruitment.

It was this right here, but even then recruitment sort of declined slightly lower. So, actually, what this motion does – the one that's on the table – is selects really the high, quite an outlier over a period of quite a long time, and, yes, the peer reviewers were concerned about these numbers, but they're not familiar.

Generally they were from abroad. They were not experts in this fishery. I don't think they're aware of that history about the productivity of the stock and its relative abundance, you know, assuming you were estimating these things correctly. I would encourage the board to consider a range, the status quo and maybe the median over that time period, something like 12 percent and 15 percent, and then show the public what measures it would take to get there and actually do give people a choice. I certainly agree with Ken on that. Thank you for your time.

MR. DICK BRAME: I'm Dick Brame with Coastal Conservation Association. With regard to supporting this, that's a no-brainer. I mean you have given the technical committee very clear guidance about how you want the fishery managed in the long term, and yet you've said you want some short-term protection for the stock. I think that's critical and that's what you've done.

In fact, the technical committee has already done the work that you're working on and that you're going to use. They've completed that portion of it and now you're asking them to look at the MS-VPA. What I would leave you with is – if I heard correctly you have to have an update in the bluefish, the striped bass and the weakfish stock assessment along with menhaden in order to do the MS-VPA.

Who thinks we can do that in two years? I don't think that could occur. We're looking at three, four or five years down the road before we have any guidance on a multispecies approach. I think that makes at least the 15 percent addition to the motion critical. Thank you.

MR. JEFF KAELIN: I'm Jeff Kaelin with Lund's Fisheries in Cape May, New Jersey. We're very active in the bait fishery for menhaden. The Forage First Campaign is alive and well up and down the coast. We've been hearing from these folks both at the New England Council and the Mid-Atlantic Council. We've had a long discussion earlier today about how important it is for this commission to work with the two councils and kind of stay on the same page.

The herring specifications were just published recently by the National Marine Fisheries Service, and in comments by the agency from forage advocates the agency said that they believe that is it sufficient that herring as forage can be considered by the SSC when it recommends ABC, which they did. The Chair of the SSC came to the New England Council and said it would be inappropriate to set aside additional forage because those needs had been considered in the assessment.

Certainly, that's the case with the menhaden assessment. The last two assessments I think were tuned with the MS-VPA results so that a predation matrix was established that already takes into consideration the forage needs of the ecosystem out there. It might make us all feel good to go home tonight and say, well, we've done something, there will be more fish swimming around out there, but how many of them will die of old age?

Are we really benefiting anything here? I don't think that as fish managers or the industry or as a country we benefit from managing fish stocks so that more fish will swim around out there and more than can be eaten in a particular year. That doesn't make us particularly comfortable as fishermen, frankly.

This issue also was addressed as we put together Amendment 14. At the Mid-Atlantic Council meeting there was a motion that was defeated twice by the council to set aside more forage so that we could all go home at night feeling that everything is great out there, I guess, and instead the council noted that the recent Omnibus Annual Catch Limit Amendment that is in place already allows harvest reductions due to forage concerns – and that is precisely the case with the Mackerel Assessment as well – and concluded that formal set-asides would be better considered when the council develops broad ecosystem-level goals and objectives, informed by their ongoing work of the Ecosystem Subcommittee of the SSC. I think I agree with Jack Travelstead originally in saying that let's pursue the MS-VPA approach before we pull the trigger. What

are we going to do? There is no limited access in the-

MR. BEAL: Jeff, let's wrap it up if you can, please.

MR. KAELIN: Well, I'm opposed to the motion. The only thing that would save it would be to at least go out with a range and tell us what the MSP value would be to get us under the overfishing target because I don't think we have a problem. I don't see a lot of things starving out there. I just wanted to make those points and I appreciate the opportunity to do it.

MR. BEAL: Thank you, Jeff. I saw two more hands in the back. I think we've had two comments from both perspectives here. I'm not sure if there is going to be a whole lot of additional things added, but we'll hopefully quickly go through these public comments.

MR. JAY ODELL: I'll make my comments brief. I'm Jay Odell of the Nature Conservancy, Mid-Atlantic Marine Program Director, speaking briefly on behalf of our million members, many of whom live on the Atlantic coast. I think Dick and Ken covered most of what I was going to say, so suffice it that I'm encouraged by the direction of this motion.

I agree with several of the speakers that a range should be included. I don't really see why you wouldn't include the range. They've already been modeled and it would give the public a greater chance to really think about all the options that are available and really in no way really tie your hands about what your ultimate decision is. Thank you.

MR. PHIL KLINE: Phil Kline, Greenpeace USA. You have the lowest stock ever. You have a hundred years of fishing this stock down. You have advice from a peer review panel that you need to change. This is not a very – this is an unacceptable range to throw out for this addendum. You actually should have a broad range so that people can actually make a choice and weigh in.

There are millions of people that are interested and care about the health of this coast and the menhaden, and it extends way beyond just users of the resource. It's almost unconscionable that I can sit here and listen to people unanimously at this table say we want to go to the ecosystem approach basically. Well, in the interim, before you get the science to support that, you can take a big step in that direction.

You leave more fish in the water and they're going to provide all of those services. What is the worse that could happen; that the stock rebounds and not only the predators but the fisheries both increase over time? Continue the way you're going and zero is not that far away from the stock. You really should include a range that addresses the public interest here, which would be the 15, 20 and 40 range that already has been modeled. Thank you.

MS. BONNIE BICK: My name is Bonnie Bick and I'm a Bay enthusiast. I feel like the menhaden are being stolen away from the eco-services that they're supposed to provide to the Bay and that they have previously provided due to their filtering capacity and their ability to be food for the predator fish. I'm very much in support of a wider range so that the public can input on this. All of the sectors of society are working to save the Bay.

The developers have to deal with storm water and land use, transportation. The farmers are very pressed on the Bay. And here we have decisions being made that are much too conservative as far as what should be changed in the fishery. I believe that the rebounding of the menhaden would have a tremendously positive effect on the health of the Bay.

I'm supporting everybody who believes that there should be a wider range of percentage for the public to come in on. I would also like to speak against the factory spotting the fish from the air and not giving them a chance to get into the Maryland part of the Bay. I think this is terrible and I just wanted to be on record saying that. Thank you very much.

MR. BEAU BEASLEY: My name is Beau Beasley. I'm a recreational fisherman and an outdoor writer. From the amount of time I've sat here today, there appears to be four groups; the leadership of the commission, recreational fishermen who would love to see Omega Protein go away, the third group is Omega Protein who seems to think there is no problem at all, the fourth group is the technical committee.

There is only one group of people here that can really lead and that's you. I would ask the commission to do that. I think you can have a balanced approach. I don't know anybody that thinks there are too many fish in the ocean; no one that I'm aware of that thinks that. This is an important species for forage fish to eat; and I

think if you just tinker on the edges, we're just rearranging the deckchairs on the Titanic.

I would say that in the research that I've done for the past year for various magazines, Omega Protein has bent over backwards giving me the information that I have requested. I have found nothing that would indicate what they're doing is illegal. What they appear to be doing is completely legal. The question is will the resource bear it?

That's the question before this commission, and I would ask you to please lead and not decide to kick the can down the road. The only thing I've heard today that was shocking to me – and I do mean shocking – is the technical committee doesn't know what direction you're managing in. If you're relying on them for expertise but you're not giving them any goals, how do you know where you're going?

I would just add that the average fisherman does not understand scientific language, but they do understand percentages. If we are at an all-time low, we should probably do something. I think you should allow the public to have some input on the percentages. I also would like to say if we're going to limit the amount of reduction, that limit should probably be shared between the bait fishery and the reduction industry rather than putting it on one particular resource. The fish are out there for everybody to use and it shouldn't be unduly borne on one industry or another, but we all have to do our part. I would just ask the commission to please lead and make some kind of decision. Thank you.

MR. BEAL: Thank you. Back to the table, given the comments you've heard from the audience, are there additional things that need to be said on this motion? Dennis Abbott.

MR. DENNIS ABBOTT: I think it's important for us to support this amendment, and I would remind the board members of our goal which says "healthy, self-sustaining populations for all Atlantic coast fish species or successful restoration well in progress by the year 2015." I think failure of not adopting this amendment would be contrary to what we stand for as a commission. I think it's very important for us board members to support this and do something positive for menhaden, a species that we've been grappling with for so many years. It is time for the board to take some real positive action.

MR. GROUT: Mr. Chairman, based on some of the discussion here, I think there is something that is missing from this particular motion. If the seconder would agree to this, **I'd like to add in at the end of "percent MSP level" at the very end of the sentence, "and develop a suite of management measures that the board could use in managing the fishery";** if the seconder would agree to that.

MR. MILLER: The seconder agrees.

MR. GROUT: Clearly, we had heard from one comment on the board that we're developing a new threshold but we aren't developing any management measures to address what come out of that, so I think that would be important in this addendum. Thank you.

MR. AUGUSTINE: Mr. Chairman, I did listen very attentively to the public comments and I did go back and referred to this document from the National Coalition for Marine Conservation. They do not put things on a paper lightly. They did indicate that there should be a range even in this, and I would suggest that we amend that to say the reference point here would be from the current level and then break out the 15, 25 and 40.

The way it reads now we are going for 15 with no other options. The document that is going to the public, the PDT will actually go ahead and identify what the reason would be why you would consider current and/or 15, 25 or 40 with emphasis on the fact that the board initially thought 15 would do it. That's my motion, Mr. Chairman.

MR. BEAL: Pat, was a motion to amend the amendment?

MR. AUGUSTINE: **Motion to amend the amendment leaving in what Mr. Grout just put in but adding including the current level – 15 is already there – add 25 and 40**. It's a public document.

MR. BEAL: Is there a second to the motion to amend the amendment? Ben Martens. All right, we're running short on time and I think this is a pretty straightforward thing. Do you want to include a range or not a range; that's the question before the board right now? Doug Grout.

MR. GROUT: Just a brief comment as to why I did not include the ranges because this is an interim. It's a two-year period and I didn't want this board to get bogged down in a whole range

of these. I chose a specific point to get us going and then in the long run we're going to have something that is more ecosystem based, so I'm going to vote against this.

MR. BEAL: All right, so everyone knows where we are parliamentary-wise, we've got three layers going on here. We've got a motion to amend the amendment; we've got a motion to amend the main motion; and we've got the main motion. We're going to vote right now on the motion to amend the amendment. Should this pass, it will become part of the motion to amend. Is there a need to caucus? All right, 30-second caucus and I will read the motion in.

(Whereupon, a caucus was held.)

MR. BEAL: Are folks ready to vote on the motion to amend the amendment? I'll read it in while everybody is wrapping up their caucus. The motion is move to amend to include the current MSP level 9 percent, 15 percent, 25 percent and 40 percent. Motion by Mr. Augustine; second by Mr. Martens. All those in favor of the motion to amend the amendment please raise your right hand; like sign, members opposed to the motion to amend the amendment; are there any abstentions, 1 abstention; any null votes, 2 null votes. **The motion fails for lack of a majority.**

That brings us back to the motion to amendment that Doug Grout made a while ago. I will read that into the record: Motion to amend to include, Number 3, utilize the goal to increase abundance and SSB and initiate an addendum to implement an interim reference point of 15 percent MSP level and develop a suite of management measures the board could use in managing the fishery. Motion by Mr. Grout; second by Mr. Miller. Ritchie White.

MR. R. WHITE: I would like a roll call vote, please.

MR. BEAL: Is there a need for a caucus? Dave Simpson.

MR. SIMPSON: I've sort of been torturing myself whether to bring this up or ask the question or not, but I've been late for lunch before and I'd rather get menhaden right than eat sooner. If you were to look at Page 169 in the assessment there is a Table 7.9 that's a summary of benchmark and terminal year values.

It shows the F-target as being under the BAM model estimate, 0.61, the current target for our fishery management plan, and the F-20 is 0.62, so I'm wondering whether that is accurate and applicable to – if that's the table I should be looking at when I think of the possibility of expanding this motion to be 15 or 20 percent to capture the spirit of a range and options for the public to comment on but not make it so broad that we don't send a signal. If in fact what I hear as our current target is more conservative than what you're suggesting, I think we ought to at least include our current target. I don't think we should backslide, so if Dr. Latour could help me with that.

DR. LATOUR: Without having verified from direct model output, I would agree that the target is at 0.61; that this table you're looking at, Table 7.9 of the modified – or edited reflecting the error document, these figures are correct.

MR. SIMPSON: Right, and so the F-20 or 0.62 is essentially the same target using the MSP currency?

MR. BEAL: David, while they're looking, one comment would be obviously the status quo is always an option for all of our documents; and depending on what their answer is, I think a description of what the current biological reference points are, threshold and target – I think they're at times getting confused between those two things – a thorough description of that in the addendum may be helpful as well.

MR. SIMPSON: That's a good point, Bob, thank you.

MR. BEAL: David, I think you sprung one on us that we're not sure we can pull an answer out of our hat right now.

DR. LATOUR: I don't want to say – it seems logical to conclude that, but I don't want to say without looking at the F for myself.

MR. SIMPSON: Could I then – because your input as always was very helpful, so long as if this motion passes and we go out for comment, that the addendum address this issue of our current target and what that would be in percent MSP so that we do capture the full range of public comment and at least not have a target that actually backslides when we're trying to advance.

MR. BEAL: Thank you, and that's my understanding of the charge to the plan

development team should this motion pass or should this and the main motion pass. With that, are there any other comments on the motion to amend the main motion? Bill Goldsborough.

MR. GOLDSBOROUGH: To David's point, might we address it more explicitly by just having this read "develop suites of management measures to achieve the 15 percent MSP and the current F-target", so you would just do it for both?

MR. BEAL: Doug, as the maker of the motion; are you comfortable with that wording?

MR. GROUT: My intent with this was to develop a suite of management measures that we could use to manage towards the target and to keep us above the threshold.

MR. BEAL: So it's understood that will be included in the draft addendum; does that sound good, Bill? Is there a need to caucus? Seeing none, we will start the roll call vote, Toni.

MS. KERNS: Maine.

MAINE: No.

MS. KERNS: New Hampshire.

NEW HAMPSHIRE: Yes.

MS. KERNS: Massachusetts.

MASSACHUSETTS: Yes.

MS. KERNS: Rhode Island.

RHODE ISLAND: Yes.

MS. KERNS: Connecticut.

CONNECTICUT: Yes.

MS. KERNS: New York.

NEW YORK: Yes.

MS. KERNS: New Jersey.

NEW JERSEY: Yes.

MS. KERNS: Delaware.

DELAWARE: Yes.

MS. KERNS: Maryland.

MARYLAND: Yes.

MS. KERNS: Potomac River Fishery Commissions

POTOMAC RIVER FISHERY COMMISSION: Null.

MS. KERNS: Is that a no or a null?

POTOMAC RIVER FISHERY COMMISSION: N-U-L-L.

MR. BEAL: I think, A.C., since you are only a one-member delegation, it is probably abstain or a yes or a no.

POTOMAC RIVER FISHERY COMMISSION: I am more than a one-man delegation.

MR. BEAL: We will record that as a null, then.

MS. KERNS: Virginia.

VIRGINIA: No.

MS. KERNS: North Carolina.

NORTH CAROLINA: Yes.

MS. KERNS: South Carolina.

SOUTH CAROLINA: Yes.

MS. KERNS: Georgia.

GEORGIA: Yes.

MS. KERNS: Florida.

FLORIDA: Yes.

MS. KERNS: National Marine Fisheries Service.

NATIONAL MARINE FISHERIES SERVICE: Yes.

MS. KERNS: U.S. Fish and Wildlife Service.

U.S. FISH AND WILDLIFE SERVICE: Yes.

MR. BEAL: **The motion carries 14 votes in favor; two in opposition; and one null vote**. That brings us to the main motion with the third point incorporated into the main motion. Is there a need to caucus on the main motion that has three points? Okay, the main motion now is move to recommend to the ISFMP Policy Board to task the Multispecies Technical Committee and the Menhaden Technical Committee with (1), to proceed with work on the Multispecies Approach as a priority; and (2), have the Menhaden Technical Committee prepare and present annual recruitment information to the board; and (3), utilize the goal to increase abundance in spawning stock biomass and to initiate an addendum to implement an interim reference point of 15 percent MSP level and develop a suite of management measures the board could use in managing the fishery. Motion by Mr. Travelstead; seconded by Mr. Cole. Is there a need to caucus on the main motion or any discussion on the main motion now that it has three parts? Lynn Fegley.

MS. FEGLEY: Mr. Chairman, a quick question to make sure we're all on the same page; the interim reference point of 15 percent refers to a limit reference point that is a threshold, correct?

MR. BEAL: That is my understanding, but I don't know if it was explicitly stated. I think given the comment that Mr. Simpson asked a few minutes ago that the current target is already below that, it seems to be consistent with the discussion that has been around the table. Doug.

MR. GROUT: Yes, that was completely my intent.

MR. BEAL: The maker of the motion has clarified that. Do you need to caucus on the main motion? Seeing none, all those in favor of the main motion please raise your right hand; like sign, those opposed to the motion, 1 in opposition; any abstentions or null votes. A.C. has got another null vote**. All right, the motion carries 15 in favor, one in opposition, no abstentions and one null vote.**

OTHER BUSINESS

MR. BEAL: I think that is everything on the agenda. There was the issue that Senator Stuart brought up regarding menhaden research. I think we can go through that pretty quickly. Tina is passing out a summary of the research projects that have been conducted over the last five years or so. The NOAA Chesapeake Bay Office pulled that together for us.

I've put together a couple of slides of background information and I will quickly go through those. The current menhaden research program is guided primarily by the information that is contained in Addendum II that was developed back in June of 2004. The technical committee developed four priorities for exploring the potential for localized depletion in the Bay back in 2004. There were a number of concerns about the harvesting practices of menhaden.

That brought up the localized depletion issue and the priorities were identified to get at that question. The four research priorities in Addendum II are abundance in Chesapeake Bay of Atlantic menhaden, removals by predators, exchange between the bay and the coast, and larval studies, essentially recruitment work.

There was also in October of 2004 a workshop of menhaden scientists, stakeholders, board members, technical committee representatives to address the ecological role of menhaden. The workshop essentially produced a number of things. The first was an evaluation and the implications of the current reference points with respect to the ecological role of Atlantic menhaden.

They also evaluated the concentrated harvest of menhaden in the Chesapeake Bay. They also provided management recommendations to the board in moving forward with Atlantic menhaden management. Based on the workshop output as well as the Addendum II priorities that I went over a moment ago, a number of projects have been funded through ASMFC, NOAA Chesapeake Bay Office, Virginia and Maryland.

The ASMFC only funded about three of the projects. It done through some of the plus-up money is what we called it. We had that in two years, I think '05 and '06. We don't currently and we have not in the last few years received that plus-up money from congress so we haven't funded any additional menhaden work or other science, for that matter.

The NOAA Chesapeake Office has supported the bulk of the menhaden research that is on the table that was passed around a few moments ago. As I mentioned, there are 20 projects listed in the document that was handed out just now. That document has not been updated for about a year

or so. It was kind of pulled together at the last minute.

The document has been existing for a while, but I got it from Derek over the weekend. If there are questions, Derek Warner is in the back of the room and knows the priorities. Three projects have been funded by ASMFC. One of those is an overlap of the project, the LIDAR Study, that is included on the sheet that was just passed out to the members of the board. Other projects were funded by Maryland and Virginia.

That is just a quick summary. The next steps potentially for menhaden research might be a synthesis of all the other results of the work that has been done. All the projects that are on the sheet in front of you potentially identify the use of the results in the stock assessment as well as management work. I think the following step would be to identify the remaining research needs.

There have been a number of projects to get at the four priorities that were identified in Addendum II, have some of those been met; and if so, what are the additional research projects that might be out there. This may be a potentially reasonable time for another menhaden research workshop to get at some of these remaining questions. The commission does not have money in its budget in 2011 to conduct that workshop, but it may be something that can be considered. That is my quick summary of how we got to where we are with menhaden research. I can answer questions as best I can or take any comments. Mr. Bowman.

MR. STEVEN BOWMAN: Mr. Chairman, thank you very much for the opportunity to speak. The reason for the letter from me; for several years I've had an association with Senator Stuart. Senator Stuart represents the 29th Senatorial District, which, of course, is in the area of the menhaden fishery as well as the fact that Senator Stuart also is an avid recreational fisherman.

For a number of years he has stressed to me and asked me a number of different questions pertaining to the management of the menhaden and stressed the need to make sure that it's managed with the best available science from not just an economical but from an ecological perspective. What I basically did in providing this letter was a nexus to the ASMFC to try to just bring up to speed as to what Senator Stuart would like to have conducted as far as the science is concerned.

This today; I'm sure the debate has been an education, as it always is to me but to him as well, to see what the desirability of the committee is as far as the direction of the management of the fishery. Of course, diverse opinions, a lot of different thoughts on the way things should be, but just basically he wanted to get out in front to indicate his desire to be objective to me, and I felt the need to convey it to the commission as a message. I think you and Mr. O'Shea and those that put together the presentation to give Senator Stuart a briefing. With that, I don't know if the senator has any comments or would like to be heard, but thank you very much.

SENATOR RICHARD H. STUART: Mr. Chairman, this has been quite an education to me today, quite frankly, and this last debate may have answered part of my request. I will also tell you that representing that part of the world, I frequently get a lot of I guess what I would call supposition about menhaden being filter feeders and other things like that.

I'd like to know if there is a definitive answer on that. I think it is certainly information to me because I hear both sides of the argument, and I'm not comfortable that I have an answer to that. That is why I made that request and hopefully this commission will consider that. Thank you.

MR. BEAL: Thank you, Senator Stuart. If there are specific questions that you have and you would like the staff to follow up on or the technical committee, we're more than happy to do that for you. Other questions or comments on menhaden research and the future of the efforts from the Chesapeake Bay Region?

ADJOURNMENT

Seeing none, anything else to come before the Atlantic Menhaden Management Board? Seeing none, the board stands adjourned.

(Whereupon, the meeting was adjourned at 1:53 o'clock p.m., March 22, 2011.)