

Atlantic States Marine Fisheries Commission

Atlantic Menhaden Technical Committee Meeting Summary

Raleigh, NC – 6/25/12

Attendance

- **TC Members** – Matt Cieri, Alexei Sharov, Behzad Mahmoudi, Joey Ballenger, Derek Orner, Micah Dean, Rob Latour, Jay McNamee, Erik Williams, Trish Murphey, Joe Smith, Amy Schueller, Jeff Brust, Bill Windley
- **ASMFC Staff** – Mike Waine
- **Public** – Mike Prager, Ron Lukens, Jud Crawford, Bill Goldsborough, Joe Grist, Shaun Gehan, Jim Sulikowski, Doug Butterworth, Dick Brame, Steve Meyers, Helen Takade-Heumacher

Intro/Review Agenda

- Jeff – There will be opportunities for public input at start, at lunch and at end of meeting.
- Jeff – *[reviews tasks to TC from recent board chair memo]*
- Jeff – task #3 is a request to provide additional information that will provide insight on the status of the stock...keep that in mind as we go through today's meeting.

Stock Assessment Update

- Amy – *[goes through assessment update presentation]*
- Alexei – *[regarding weight-at-age plots]* - there is density-dependent growth in this species...high weights-at-age corresponds with low abundance period. This could be an additional piece of information with which to evaluate the current status of the stock.
- Behzad – which age class is dominant? Where would you expect this relationship to be most pronounced?
- Joe S – the contemporary fishery is dominated by age 2, but in the past it has been age 0s and 1s
- Rob – *[regarding plots comparing the update to previous benchmark]* - are benchmark fits reflective of incorrect PRFC effort data?
- Amy – yes, we did not go back and re-run benchmark plots with corrected data
- Alexei – *[regarding retrospective plots]* – percent of relative change is calculated with respect to 2011?
- Amy – yes.
- Behzad – we need to revisit how dome-shaped selectivity is estimate in the BAM. Seems like a very steep decline from age of full recruitment to maximum age. Best to visit this thoroughly through a benchmark
- Rob – *[to Amy]* any insight why the model doesn't want to fit index data?
- Amy – in the sensitivity analysis, we explored dropping each data source in turn, but with no improvement in fits...it is likely more than one data source is causing this issue

- Rob – it could be that incongruence in M and recruitment pattern is causing this as well. It is disconcerting that even with significant adjustment of the model’s “knobs,” you still can achieve a decent fit to the two indices
- Alexei – the PRFC fixed selectivity seems potentially very wrong. Now that we have age structure information from the area near the pound nets, this should be investigated. We could look at MD pound net data, or even the reduction fishery age structure. Also, we assume the JAI is representative of coast-wide recruitment, but this may not be accurate. The JAI is a mash-up of various surveys not designed to target menhaden, and which have changed over the years. Also, we need a better grasp on the spatial structure of the stock, recruitment and landings. There are significant regional differences that need to be taken into account
- Jeff – *[to Alexei]* – I’m not clear on this...are you proposing this information/analysis be added to the assessment document?
- Behzad – is this part of the board charge we are addressing today?
- Matt/Rob – no, it is not.
- Rob – *[to Alexei]* - what would you display?
- Alexei – state-specific JAI fits
- Rob – overall fitting of coast-wide JAI is not very transparent. In any given year, you could have component indices going in opposite directions. The coast-wide index is a giant averaging exercise.
- Alexei – The whole recruitment pulse in a given year may be occurring in a particular region, which could be lost in the coast-wide JAI
- Rob – sounds like this is a data investigation or research initiative more appropriate for a benchmark, not an update
- Matt – we could put the state-specific indices in the document, but what do we expect the board to do with that information? Especially if we don’t have the opportunity to fully discuss what it means
- Erik – there is no reason to include it, unless we are able to discuss it. To do otherwise would be negligent
- Alexei – believes there is some information in the state-specific JAIs that are more congruent with the landings data
- Jeff – As the one who will be presenting to the board, I am comfortable with explaining the spatial differences in the recruitment indices, but I am uncomfortable with the anticipated next questions of “what do we do with this information?”
- Alexei – we have two options: 1) provide some information that shows our recruitment data sources could be more consistent with the landings. 2) or we present the GLM fitted coast-wide JAI and say that we have no idea what could be causing the issue
- Joe – *[shows age structure data]* – there has been an increase in age 1’s in the last 3 years in all regions...this lends evidence to an increase in recruitment that isn’t being picked up in the coast-wide JAI
- Micah – the apparent increase in age 1 proportion could also be a function of the loss of the NC menhaden fleet which targeted younger fish. Prior to 2005, age 0s

- comprised upwards of 20% in some years and now contribute less than 1%. As a result, we would expect to see a higher proportion of age 1s
- Erik – we need to step back and discuss board charge #3. This is the 11th hour, it seems way too late to come up with meaningful alternative advice to inform the status of the stock
 - Matt – we need to come to a decision as to whether this model is useful for management first before we discuss alternate sources of information
 - Jeff – let's let Amy finish her presentation, and then discuss what additional information can be provided to address board task #3
 - Mike – *[regarding the assessment timeline]* – the intent is to finalize the document today. But we do have time before the next meeting to have another conference call, if necessary
 - Amy – *[shows projection slides]*
 - Alexei – it's too late to do this, but we should probably eliminate any runs where $F > 10$ (or even 5)...simply because these are wildly unreasonable numbers
 - Mike – *[regarding allocation between reduction and bait fleets]* - the board is discussing possible scenarios, how simple it is to re-run the projections?
 - Amy – depending on the number of scenarios, it might take a couple of days
 - Matt – there could be spatial considerations to the allocation scenarios as well
 - Rob – we should figure out whether we feel the projections are informative at all before we discuss new scenarios to be run
 - Alexei – *[regarding the assessment update document]* - overall, I feel that it is very well written and reflective of the TC deliberations

Review Conclusions and Recommendations

- Jeff – *[goes through presentation]*
 - *Overweighting of the age comp data - yields lower F and higher SSB; down-weighting did not improve fit to indices*
 - *Lack of spatial modeling – needed to address changes in fishery over time; dome-shaped selectivity runs attempt to account this*
 - *Lack of a coast-wide adult abundance index - will not be resolved anytime soon*
 - *Poor PRFC fit - upward trend in index is not fit, even under sensitivity runs*
 - *Strong retrospective pattern (in both F and SSB) - suggests the model is not stable with addition to new data*
 - *Overall – casts significant doubt on the accuracy of the assessment & should not be used for management*
 - *TC did not choose nor endorse current reference points*
 - *Projections are not useful for setting TAC*
 - *Expedited benchmark appears necessary*

Reference Points

- Rob – the recommendation from the last peer review was to come up with reference points that tied back to virgin biomass. The TC put up %SPR as the

most obvious way to achieve this...this functionally is an endorsement of the methodology

- Erik – but the TC was never asked what a chosen SPR level was meant to be a proxy for...MSY? Ecosystem reference points?
- Rob – but we did offer SPR as a valid method. And we offered a choice of SPR levels and the potential cuts to landings that each represented.
- Alexei – the TC put out a document that laid out our SPR methodology, which we can't back away from now.
- Rob – With the board's selected reference points, they have for the first time elected a management regime that is substantially different from the past
- Amy – the board tasked us with providing options, and we did...it was not an endorsement
- Erik – in the federal realm, the job of selecting reference points lies with the scientists, not the managers. We endorsed the methodology, not the actual choices, because we were never told what the objectives/goals were.
- Alexei – the board's stated goal was to reduce F for consideration of ecosystem services. Even with a more clearly defined goal, there is still no single magic number
- Rob – do we even have to make a statement in the report about the chosen reference points and whether we endorse them?
- Rob – we can't divorce ourselves from the chosen F15% threshold, because we offered up 9% as where we were at, 30% as an appropriate target for a pelagic forage species, and 15% as the "middle ground"
- Behzad – can't we just lay out the sequence of events that got us to where we are?
- Matt – keep in mind that the SPR method was always intended to be an interim measure on the road to ecosystem based reference points
- Jeff – I'm hearing that the wording needs to be changed to simply lay out the evolution of the current reference points
- TC - agreed

Model Usefulness for Management

- Alexei – we need to keep in mind the time scale, when we say it shouldn't be used for management
- Jeff – but it's really the terminal year that the board is interested in
- Alexei – disagree
- Rob – the statement that the model is not useful is not necessarily true...the problems identified in this assessment were there in the last benchmark
- Erik – while the last benchmark did pass, significant issues were identified...it feels like it could have easily gone the other way (i.e. not passed). Now that the model has been updated with new data, thinking has evolved
- Matt – the flip-flopping retrospective pattern was not evident in the last benchmark. A similar situation occurred in Atlantic herring which caused a peer-reviewed assessment to be dropped during an update

- Erik – the retrospective pattern in recruitment also shows serious structural problems with the model...the oldest retrospective run shows the largest deviation, whereas you would expect to see the opposite
- Alexei – given the uncertainty, the question is: can the model still tell us where we are in relation to the threshold?
- Erik – this gets at the other major source of uncertainty: the possible dome shaped selectivity. If this is true, the reference points are off
- Rob – we are going into a pretty deep review of our own work here...is this appropriate?
- Erik – what’s the purpose of an update?
- Matt – feels an update is an opportunity to see if your model still working...and it doesn’t appear to be working
- Amy – agrees with Erik & Matt, the retrospective pattern wasn’t really apparent/discussed/understood in the previous benchmark...now it has become a major concern.
- Matt – personally feels that if we wait for a benchmark, that we will be in a better position to produce an appropriate TAC that can be carved up by fleet/region
- Micah – this discussion sounds familiar...didn’t we already go over this topic on the last conference call? It seems like we can’t come to a consensus on a “thumbs up” or “thumbs down” determination on the model usefulness for management. Can’t we just lay out all the issues we’ve identified?
- Jeff – but the board put us on the spot to say whether It’s useful or not
- Jay – agree with Micah on the whole, but the selectivity runs all appear to achieve the same stock status, albeit with large differences in magnitude.
- Erik – the dome-shaped selectivity runs did not recalculate the reference points, which would be affected by the altered selectivity
- Amy – keep in mind that we’ve only done 3 sensitivity runs (if you omit the dome-shaped selectivity runs)
- Matt – need to be clear that overfishing status is a function of the choice of reference point.
- Rob – it is true that we are overfishing because of a philosophical change in management, but that was the board’s choice & our task is to determine status in relation to that threshold.
- Jeff – is the group OK with making the following statement: that current status is likely correct (i.e. overfishing is occurring), but the magnitude of the $F/F_{\text{threshold}}$ ratio is highly uncertain.
- TC – agreed

Public Comment

- Doug B – *[to Erik’s and Rob’s earlier comments]* - this information *[likelihood components table]* was not available at the last assessment. The likelihood table for the selectivity runs shows that dome-shaped selectivity achieves 120 pts lower negative log-likelihood, which appears to reject the base run model.
- Matt – for procedural reasons, we can’t support an alternative model in an update

[BREAK FOR LUNCH]

Review Conclusions and Recommendations - Continued

Projections

- Jeff – this is the question: do we feel the projections are useful?
- Alexei – this was the only place in the assessment document that felt inadequate... the projection results were too short & the caveat section was too long. Obviously, these projections cannot be used to set annual TACs because they follow a constant landings scenario. However, they could be used to show the magnitude of impact on landings. The chief source of uncertainty in the projections is recruitment. The retrospective bias doesn't affect the outcome of the projections after the modeled year classes die off in ~4 years...the median values will still be similar.
- Joe – didn't Genny read us some text over the last conference call that the board wanted projections for the purpose of setting TACs?
- Erik – sensitivity issues still do have an effect on projections
- Alexei – you are always subject to your assumptions when you do projections
- Erik – the problem is that we've lost the ability to make the connection from a given F to an absolute TAC
- Rob – seems like we're headed in an ad-hoc management direction, which means that projections wouldn't be used anyway
- Alexei – these types of projections are being used elsewhere, albeit with limited success
- Behzad – *[to Rob]* - what are your thoughts about ad hoc management?
- Rob – we don't have an assessment for butterflyfish and the discussions typically center around catch history (mean catch, median catch, etc)
- Matt – keep in mind there needs to be a precautionary buffer simply because we are going to an ad-hoc management approach...and also a precautionary buffer because we are fairly confident that we are overfishing. So the simple average of the recent catch is not really tenable
- Mike – if the board is not going to use the projections to set TAC, they will be looking for an alternative
- Erik – since we cannot say how much we are overfishing, just that we are overfishing, the projections should not be used to determine how much reduction in landings is needed to achieve the threshold
- Alexei – but will we be in a better position to answer those questions in three years?
- Erik/Matt – yes, we will have a benchmark that will address some of the spatial considerations, per-recruit issues, etc.
- Behzad – *[to Alexei]* – so, if we cannot use the projections to set TACs, explain what they could be used for?
- Alexei – putting aside the issues of dome-shaped selectivity, the projections still provide information about the population's response to a reduction in landings.

- Rob – we have 3 options: 1) we believe the projections completely; 2) we believe the projections, with caveats; or 3) we do not believe projections. Where are we? Somewhere between 2 and 3?
- Matt – can we offer an ad hoc approach? Average landings minus a buffer for uncertainty & our current overfishing status? How much less is the question
- Erik – do not believe we are all that certain of our status anyway
- Jeff – to sum up, we can agree that the projections cannot be used to set TACs, but can tell us the direction of the population response from a cut in landings
- Matt – we should offer examples of how these ad hoc management situations have been dealt with in other fisheries
- Mike – there is no harm in showing them what has occurred in other fisheries
- Jeff/Erik – but we need to make the point that these approaches may not work for menhaden.

Public Comment

- Mike P – is the stock probably being overfished or not? Originally thought that was the case, but as this process has evolved, and issues have arisen, the answer has become unclear. Not sure if the model even passes a basic red-faced test. There are 2 indices: one is flat, one is going up. Catches are going down, but the model says that F is skyrocketing. On a very basic level, how do you reconcile that? Everything in this model is dependent on selectivity, which currently does not represent what we know about menhaden. The migration up the coast is not just an hypothesis, Arrenholtz (1991) published a paper documenting this. The best solution is to call for an expedited benchmark.
- Jud C – *[regarding use of projections]* - Is anyone aware of a federally-managed stock that didn't follow the rebuilding schedule, regardless of the quality of the data/model? Also, keep in mind the board wanted to reduce F to increase SSB. This decision had a lot of work that went into it...and it was a deliberative process (TC, Board, public comment, etc). There is not much question regarding board task #3: the report will come with a long list of caveats and high uncertainty in the assessment model...so the board is requesting alternative information or methods. Board has stated an explicit goal of targeting 30% SPR, and to manage for the threshold of F15%. Thinks an ad hoc approach based on catch history makes sense; the TC should consult the NOAA technical memo on dealing with stocks that only have reliable catch data.
- Doug B – *[to Matt's earlier comment]* - you don't have to adopt a sensitivity run at this point...but you should say that because the dome-shaped selectivity run had a substantially improved likelihood, it appears the base run is wrong. *[to Judd]* - agreed, but remember that everything that has been said is dependent on selectivity. *[regarding his own earlier comments]* - Why are you not throwing out the base run? 2 concerns: 1) the likelihoods are overweighting the catch-at-age. And 2) whether you can freely estimate the selectivity or not, the dome-shaped selectivity run yields a far better fit to the data than the base run.
- Shaun G – there are parallels between the problems this TC is currently faced with and a council SSC, but the federal process is very structured by requirements to calculate ABCs, ACLs, etc. Agrees with Rob that an ad hoc approach based on

- recent catch history is warranted, but worried about the precautionary deductions. Does anyone think that even if we continued fishing at 2011 levels, that we would crash the stock? There isn't a lot of scientific basis for a large % reduction.
- Dick B – stepping back, we have a 55 year time series, recruitment is down and a contracted age structure. The board is looking for management advice on how to turn the trend around. The TC should do its best to provide that advice.

Omega Aerial Survey Pilot Study

- James S – *[gives presentation on survey methods]*
 - *Long recognized need for an aerial survey*
 - *Only had 3 weeks to plan/organize survey - had to adapt on the fly to make it work*
 - *Stayed as tight to the coast as possible on the first transect, then 5-8 km further offshore on each subsequent transect*
 - *3 ad hoc regions - goal was to fly an entire ad hoc region within 3 days, but this was not always possible*
 - *Hurricane Irene caused almost complete dissipation of the schools for 2 weeks*
 - *No fly zones from Obama visit*
 - *At times, fog & glare make detecting schools problematic*
 - *Most significant issue was rocky outcroppings in the north, which looked like menhaden schools*
 - *Southern pilots did not have experience with this type of habitat*
 - *Decided to survey at lower altitude (1000 ft) to help address this*
 - *At-sea sampling*
 - *Hurricane Irene made coordination problematic*
 - *2 point sets: One in RI, one in NJ*
 - *Used to make linear relationship between observed surface area and biomass*
- Doug B – *[gives presentation of analytical methods and results]*
 - *Basic line transect approach*
 - *All abundance estimations came from pilot's abundance estimate, not the calibrated abundance using the at-sea regression*
 - *For comparison of northern (non-fishery) and southern (fishery) regions, used an index of relative abundance that standardized observed biomass by flight time, and scaled up by region size*
 - *Estimate 127,000 mt in northern regions*
 - *2.6 times more abundance in NE than in southern region*
 - *Catch age composition: set from RI is older than NJ*
 - *Caveats downward - not all areas to north covered; hurricane Irene effects;*
 - *Caveats upward - potential double-counting of fish; larger distance offshore in southern region;*
 - *Other caveats - comparability of spotter pilot sighting efficiency; regional variation in environmental conditions*

- Behzad – good list of caveats, but only 2 samples for the comparison of age structure is troubling
- Alexei – your relative biomass ratio is 2.6 to 1 for New England region : Southern region. But, there is a lot of cryptic biomass accounted for in there: variation in line width, environmental considerations, etc. At this point, you really can only say that there are menhaden outside of the fishery area.
- Doug B – agreed, but there is evidence for northern biomass being roughly on the same order of magnitude as the southern biomass
- Micah – your measure of relative biomass is largely dependent on the calculated size of the study areas. Should try to account for issues affecting the calculation of area size: 1) disparities in resolution of shoreline data; and 2) it's important to use a map projection that minimizes distortion in the calculation of area, especially given the broad latitude/longitude scope of the project.
- Doug B – using the lessons learned in this pilot project, a survey could be put together right away which could provide a good estimate of the spatial pattern of menhaden abundance.
- Behzad – the need for a coast-wide aerial survey has been identified almost every year through the research recommendations made by this committee
- Rob – progress is being made...a survey design project is currently ongoing through VMRC
- Matt – keep in mind that NE boats steam to NJ to catch menhaden...so, are they really driving past 2.6x higher abundance to fish further south? These are experienced purse seiners...if the fish were available to them in NE, they would catch them there.
- Doug B – the vast majority of NE abundance was found in region 1, which included northern NJ and Long Island
- Jeff – so to get back to the board's request for us to look at this issue...can we just say that we've looked at, think it's a good idea, are discussing it and already working on a potential survey design?
- Joey – need to prioritize the research recommendations so that funds can be targeted towards projects that yield the greatest benefit to the assessment
- Rob – essentially, this is a money issue
- Erik – [to Rob] - will your aerial survey design project yield an estimate of cost?
- Rob – yes
- Doug B – it is imperative that a solid survey design is established in order to proceed. Therefore, preliminary work should start right away. But if money is available, it could be done.

Report Revisions

- Jeff – how should we proceed? Come up with changes/additions to the update document as written (based on today's discussion), email around, have a conference call to confirm, and then just insert into the document?
- Mike – could we just go through Genny's "strawman" document drafted as response to the board tasks? That may address most of what we've discussed today

- Jeff – *[goes through Genny’s “strawman” document, the group wordsmiths...see Jeff for that document]*
- Mike – *[polls the TC for availability – schedules conference call for Monday July 9 from 2-4pm]*

Board task #3: Alternative Information to Inform the Status of the Stock

- Alexei – essentially, we refused to do this one
- Jay – not really, we agreed that we probably didn’t have time to address this
- Matt – we are planning on providing a summary of what has been done in other fisheries that have had to go to ad hoc management
- Alexei – *[reiterates issues with the coast-wide JAI and that some component surveys may be more congruent with trends in landings]*
- Erik – but does that inform the determination of the status of the stock?
- Alexei – is recruitment crashing or skyrocketing? This is something that might indicate that the model is incorrect
- Erik – if we had a useable data source, it would already have been included in the assessment
- Rob – if the normal model output is not reliable, it may be possible to look for trends in the input data that could help determine the stock status. But it’s not clear what providing the managers with 7 state-specific JAIs would do to help in this determination.
- Micah – could we just report the trends in input data, and re-iterate the issues with each? This will at least address the board task directly
- Behzad – but we just said we have concerns about how representative the 2 indices are of actual population dynamics *[referring to the word-smithed version of Genny’s “strawman” document]*
- Micah – What is the board supposed to do with a set of trends in input data that each tell a different story? Which one should be believed? The point of the assessment model is to provide an objective framework to evaluate all the information contained in the input data...and our assessment model currently appears unreliable.
- Rob – so, is the TC prepared to make a statement about these input data being used?
- Alexei – believes we could say that we are in roughly the same place as we’ve been
- Rob – the situation does not appear to have gotten worse
- Erik – not certain we could even say that. There may be relevant information that could be gleaned from input data, but it is too late in the process for us to have a realistic discussion and provide meaningful guidance.
- Micah – this brings us back to our original position on this task. At the beginning of today’s meeting, we decided the priority was to finish the update process, and then discuss alternative sources of information if we had time. It appears we’ve run out of time to really address this task.
- TC - agreed

Public Comment

- Shaun G – agrees with Alexei's last statement
- Mike P – it is unlikely that the stock is in crisis...the data appear roughly level over the past 10-15 years (if you believe the data).