

Atlantic States Marine Fisheries Commission
Atlantic Menhaden Technical Committee
Conference Call Summary

March 4 and 7, 2011

Participants

Committee Members:

Jeff Brust (NJ)
Alexei Sharov (MD)
Rob Latour, Chair (VIMS)
Joseph Smith (NMFS)
Douglas Vaughan (NMFS)
Jason McNamee (RI)

Behzad Mahmoudi (FL)
Steve Minkkinen (FWS)
Micah Dean (MA)
Mark Collins (SC)
Derek Orner (NMFS)
Trish Murphey (NC)
Genny Nesslage, (ASMFC)

AP Members and Guests:

Ron Lukens (AP member)
Amy Schueller (NMFS)
Jeff Kaelin (AP member)
Dick Brame (CCA)
Erik Williams (NMFS)

Bill Goldsborough
Erik Schneider
Mike Prager
William Windley (AP member)

Staff:

Toni Kerns, Mike Waine, and Genny Nesslage

Board Tasks for the Technical Committee

The Atlantic menhaden technical committee (TC) was charged with determining if alternative reference points were a viable option for Atlantic menhaden management.

BAM based SPR

The TC received briefing on methods used to calculate an SPR analysis that included the review of alternative reference points. Presented results focused on output of SSB, recruitment (R), and landings at different target fishing mortality rates as requested by the Board ($F_{15\%}$, 25%, 40%, and $F_{\text{current}}\%$).

COMMENTS

- EW: It was difficult to choose the “best” SPR because menhaden is not a typical MSY managed species, and the Board’s management objectives are not completely defined.
- TC noted little difference in the results from the full time series when compared to results from the past five years.
- Several members made arguments for presenting a shorter time series, mainly (1) weight at age and selectivity has changed through time, and (2) the volatile nature of annual recruitment.
- **ACTION: TC agreed to present a shorter time series with the caveat that it is more representative of recent times and does not capture the entire time series.**
- **ACTION: TC does not plan to make concrete recommendations in the absence of well defined Board objectives.**

Projections

The TC evaluated modeled projections detailing the relationship of SSB, R, F, and landings. The Board wanted to know what to expect from the population and fishery under different assumptions.

COMMENTS

- Micah: for runs where SR is specified, the median recruits are not affected by spawners
- Alexei: Also, it was interesting that empirical results were the same as parametric
- Alexei: expressed concern with spikes in trends in early years, but acknowledged it was based on the calculation method, and the data used to fit the model.
- Rob: The initial spike in trends seems to be altering CVs in later years.
- Amy: Agreed, caused by use of real landings, but constant landings work shows it's hard to assign specific F to given landings scenario because F and landings are not correlated.
- **ACTION: TC will present projections with first few years noting caveat above.**

Constant landings

The Board requested the TC to review predictions using constant F and constant landings. Amy Shueller (NMFS) presented modeled predictions under constant landing scenarios.

COMMENTS

- Genny: How are we going to reduce F and double landings? How do they keep F constant?
- Would require annual assessment, and essentially turns the fishery into quota managed fishery.
- Could be alternative, but would need to be conservative to prevent overfishing (e.g., constant landings).
- Despite the vast number of predictions, all methods had very similar results with few exceptions.
- Projections suggest that R is independent of F and SSB, but lower Fs result in higher SSBs with similar or slightly lower landings when compared to current landings.
- EW: We don't understand what is driving the population changes, but it may not be the fishery, if it is environmental variability, do we have any control over it?
- Alexei: Fs have been high over entire time period and we don't know what the stock would do at lower Fs, would it increase? Also how to incorporate predators?
- Rob: what about trend in total N seeing as we are at lowest level how did we get there, and how do we get away from there?
- Erik: your last point hit it on the head, how low do we want to take this stock and how much faith do we have that R will rebound and bring stock back?
- MP: suggests that TC show figures using short time series since they are more representative of recent time and don't have such large jumps, the TC AGREES.

ACTION: Summary of message to Board in bullets below,

- **Explain SPR projection scenarios, show one set of 4, and summary table.**
- **Point out that they are essentially giving similar results, but highlight range and exceptions.**

- **R is independent of F and SSB, but lower Fs result in higher SSBs with similar or slightly lower landings when compared to current landings.**

Additional question of how much of SSB goes to predation?

- Alexei, it's a rate, so if F decreases, M is same so some % of not captured B goes to predation and rest goes to increase SSB

Alexei's projections

Alexei had prepared projections by Categorizes S-R relationship into high, medium, low (3x3 = 9 blocks) and using probabilities in each block to predict recruitment.

COMMENTS

- TC agreed that results were very similar to Amy's project work.

ACTION: Two strategies depending on Board's objectives

If Board selects MSP ref pts, does TC have preferred level for Board consideration?

Sissenwine's paper gives wide range (0.1 to 0.6), higher number favors ecosystem, lower number favors fishery, option depends on well defined Board objectives.

(1) If single species management is the goal:

- To implement a % MSP management scenario annual quota estimation would be required.
- In order to implement this an annual assessment would be ideal.
- This will not necessarily lead to increase in R, but it may make it possible for high R in favorable environmental conditions because our observations do not indicate a strong relationship between R and the SSB.

(2) If trying to increase forage base:

- Implementing moderate or conservative F based %MSP is likely to increase the forage base.

COMMENTS

- MP: don't compare absolute values of yield from projections to current/historic yields since projections are dependent on inputs (recruitment). Instead look at proportional change in C for different MSPs from projections (projection vs projection rather than projection vs history). Then look at different configuration (*e.g.* SR relationship vs no SR relationship) to see if the different MSPs give similar results. This analysis does not give preferred option, but puts everything in perspective for Board of what different MSP options might produce.

N-based reference points

TC received briefing on abundance based reference points from Jason McNamee (RI) using (1) the updated assessment, and (2) decisions from the January 2011 meeting to look at last 10 yrs, last 30 yrs, for ages 0, 1, 3+, look at median, 25% and 75% percentiles.

COMMENTS

- Alexei: shouldn't use terminal point for age 0 since it's so poorly estimated, otherwise terminal year is OK
- Rob: to be consistent, shouldn't we use same year for all, so use 2008?
- Jay: provide info to Board but need to lay out caveats. Other meetings have requested comparison of N versus recruits and eggs versus recruits. Matt did simple linear

regression, but we wanted more (so what other predictor variables do we want to include?)

- Alexei: look at age 2+ or age 3+, see if you can come up with stronger relationship.
- Doug: has problem using N instead of eggs unless you can come up with good biological argument, simply finding better relationship is not proof,
- Rob: we seem to be on the verge of data dredging hoping to find better relationship, so we need to be sure if we proceed that it is with valid objectives and scientific reasons (e.g., hypothesis testing)
- Alexei: Board has requested we look at this thoroughly, so we can look at a limited number of combinations based on N at age * maturity schedule for a couple plus groups, also use WAA for females. If S-R relationship exists, then N based ref pts would give you a minimum N to get sufficient R to maintain/build stock.
- Micah: maybe just present to Board that we don't see a clear relationship and we will continue to look into it, but we don't need to present it to them in March.
- Rob: don't want to gloss over anything want to give everything equal weight for Boards' consideration so that they don't ignore any of the options.

ACTION: Jay will move forward and we will review by email. Use 2008 as terminal year (drop 2009 for all age groups investigated)

TC revisited Doug Butterworth's paper that was presented during the January 2011 TC meeting.

COMMENTS

- The recruitment index could be used as predictor of population size. So if we want to keep stock size in the range we have seen over last 20 years, we only need to look at JAI and as long as it's above "level X" then we are fine. Do we feel it is worth including with info to Board?
- Alexei: Board seems to be asking for more, they got recommendation from peer review panel to be more conservative and this method adds no more conservation.
- Toni: it falls under N based reference point, so is it viable tool in the Board's toolbox?
- Alexei: yes it probably is, tells us when we are more likely to have recruitment failure, results applicable to last 20 years (beyond that more variability in R and index not good predictor of N). So method is less conservative than our work (assumes last 20 years are "good", but if we are actually in poor condition, then could be dangerous). This could be improved (again, method good, configuration needs work).
- **ACTION: TC agrees that technically this is a sound method, so find it hard to reject it outright and is worth bringing forward to Board.**
- Since it is outside (non-TC) work, TC will need to give similar consideration to any other proposed outside work in the future provided it has technical merit and integrity.
- TC reviewed that SPR gives overfishing definition; N based gives overfished definition.

Utility of MSTC reports

Board received update on MSTC reports, but requested guidance from TC on how to proceed?

- MSVPA – (1) does not provide any reference points, so immediate use is limited

(2) could develop triggers/ref pts but these would require considerable discussion since they are not traditional (3) would require annual updates of all the input species (4) no direct measure of uncertainty in output (can be calculated indirectly) (5) does not cover full coast (ME to NC)

ACTION: If Board chooses to manage from “ecosystem” perspective this is the most appropriate candidate

However, BAM already uses M output, and Board would not be able to manage annually to allow updates of inputs, and they would want to increase resources for further development of this product.

- EWE – (1) needs to be updated and expand it outside C Bay (i.e., we would need to create a new model), at least a 2 yr process (2) we would have to take it on as group since we can't allocate Howard's time to work solely on this (3) management timeframe would probably be closer to 5+ years because of all the input species and time series.

Cons: primarily an exploratory model, and unlikely to be useful for practical management because it requires too much time, resources, and is not an assessment model.

ACTION: Could work in tandem with MSVPA or other model to investigate concurrence and look at tradeoffs of diff management strategies

- B scalar – (1) poor model stability, doesn't provide good estimates of R (2) predator prey relationships not fit to model (based on independent modeling exercises, not fit to raw data, but results of different models) (3) reference points based on subjective decision and could get the same from MSVPA which is more attractive analytical framework.
- Pred-prey ratios – same arguments as B-scalar, identifying time periods of “good” and “bad” ratios; simple, arbitrary, but could do same with MSVPA.
- Steele-Henderson – (1) doesn't include age structure, but is an actual model fitting procedure (2) can get internally derived ref pts (3) inferences about predation not based on predator-prey relation, only on comparison of indices.

COMMENTS

It may be a good idea to run this in parallel with MSVPA (multiple models). We need to check that results are realistic (correlation does not mean causation). Also needs refinement/testing to investigate other data sources (non-MRFSS), predators, factors to improve. The methodology is appropriate but configuration could be improved.

ACTION: TC agrees that SH model may be a second choice to MSVPA.

ACTION: TC will follow above actions, and MSTC will provide additional details on the models and results.