Atlantic States Marine Fisheries Commission

ASMFC Menhaden TC/SAS Meeting

Raleigh, NC – 5/15/2012

TC Members – Jeff, Alexi, Behzad, Matt, Micah, Erik, Joe (NC), Joe (VA), Joey (SC), Derek, Trish

ASMFC Staff – Mike

Audience – Judd, Doug Butterworth (Omega), Mike Prager (Omega), Ron Lukens (Omega), Jeff Kalin (Lunds), Dick Brain (CCA), Alison Fairweather, Ken, Bill Golsborough (MD commissioner)

Elect Stock Assessment Subcommittee Chair

- Erik Williams volunteers to be SAS chair (all agree)

Review Timeline

- Webinars to follow on this work on 5/29 and 6/7

Review Preliminary Stock Assessment Update Results

- Data Review (Joe Smith)
    - Constants from previous assessment:
        - Ageing error
        - Maturity
    - Updated from previous (3yrs of additional data)
        - Wt-at-age at spawning
        - Wt-at-age at Jan 1
        - Fecundity
        - MSVPA M
        - Reduction & bait landings
        - MRFSS/MRIP landings
        - JAI & PRFC indices
    - Wt-at-age spawning & Jan 1 changed little
    - M (MSVPA)- somewhat higher for older age menhaden now, but not a dramatic change
    - Reduction landings – little change from recent history
        - Joe (VA) – how much influence do landings have in the model? There were a couple years where the reduction plant had self-imposed fishing limits due to changes to their facility.
        - Erik – We aren't using a CPUE index, so they should have little influence on estimates of abundance; but they do inform the age composition and will influence the estimate of F.
        - Doug B – do you see a large variation in length-at-age?
        - Joe (NC) – you do see larger A3 fish in NJ than in CB

        - Doug B – So, is the spatial stratification of fish more length –based than age-based?
        - Joe (NC) – No, we see both older fish and longer-at-age fish further north
    - Bait landings – continues upward trend; 2011 is highest of time series
        - Matt – How good is our age comp for the bait?
        - Joe (NC) – we have a full-time sampler covering the VA snapper boats; NJ provides ~50 ten-fish samples; together those account for ~85% of the bait lanidngs; We have very few samples from New England, mostly because RI boats have chosen to fish in NJ recently.
    - MRFSS/MRIP
        - 1981-2003 remain same (MRFFS)
        - 2004-2011 updated (MRIP); there is a change, but the magnitude is tiny compared to reduction and bait fisheries
    - JAI – little change
    - PRFC – "net-days" provided by PRFC for 2004-2008 were incorrect…have now been corrected. Therefore, 2004-2011 are update from previous.
        - Behzad – what is approximate CV of the PRFC data?
        - Erik – the assumed value for the model is 0.5
        - Doug B – 0.5 seems much too high for the observed time series…there doesn't appear to be that amount of variation in the time series.
        - Joe (NC) – Also, we only have age samples from Potomac pound nets for last 2 years. These data (50% A1; 25-30% A2; 18% A3+) will not be incorporated into the current update, but will be used to inform the selectivity of the PRFC in next benchmark
- Assessment Results Review (Erik)
    - Basically added 3 yrs of data (2009-2011)
    - Only snag was that a bound was being hit on initialization – Bound was increased & the model ran
    - Age Composition - update fit is nearly identical to previous fit, for both reduction and bait
        - Doug B – time invariant logistic selectivity?
        - Erik – Yes, for both reduction and bait
    - JAI – update fit is very similar historically to previous run; additional yrs show a slight downward trend
    - PRFC – there is a strong trend in residuals over past 20 years (model fit is consistently under estimating the data)
        - Doug B – when you've got such a poor fit, should either toss the data or toss the model;
        - Behzad – we have pretty good agreement prior to 2003 between PRFC and the JAI (at least the CB JAI)…but that seems to fall apart in recent years.
        - Alexi – perhaps older fish originating from outside the bay are coming into the bay and are now more available to the PRFC pound nets.
        - Doug B – A priori, if the JAI fits better than the PRFC, the decision seems clear to go with the JAI, which is a broad fishery-independent survey. On the other hand, the PRFC appears to have fit better in the past.

        - Matt – we could possibly break the time series if there has been some significant change in how the pound nets have been fished
        - Joey (SC) – can we even drop the PRFC even if we wanted to? This is just an update…that would have to be done in a benchmark
        - Erik – true, but we should still identify these issues and explore them with sensitivity analyses
- Landings – fit is identical to previous (both reduction and bait)
- Full F – similar to previous for historical data, dramatic increase in F in recent yrs (09-11) in both reduction and bait (highest for time series in bait)
- F2+ - also dramatic increase in recent yrs (09-11)
    - Mike Prager – noticed that older fish (A4+) were being consistently underestimated in the age comp data
    - Doug B – there is typically very high uncertainty in the terminal year F, and if you omit the last point in the F time series plots, the increasing trend doesn't look nearly as alarming.
    - Matt – while the trend in F is increasing, the trend is less steep than previous benchmark pattern…perhaps we should do a retrospective analysis
- Static SPR – trending down in recent yrs (inversely related to F)
- Stock-recruit relationship – little change from previous
- Biomass – a small change from previous values in late 2000s
- Recruitment – last 4 yrs show a decreasing trend, even though the observed JAI values are pretty much flat; Deviations pretty low for 2010
- Selectivity – estimated, but fixed at a logistic function (used in equilibrium calculations)
    - Reduction – no change
    - Bait – small changes
- Phase plot – last few yrs appear to be headed in the high F, low FEC direction
- DISCUSSION
    - Behzad – did you put a cap on the effective sample size for Age Comp data? Is it possible that we're over-fitting the age comp data?
        - Erik – No, there is currently no cap, but that could be explored in sensitivity analyses…the range in reduction effective sample size is 300-1300
    - Behzad – is the PRFC fit being weighted by the CV
        - Erik – yes, but it's an assumed fixed value of 0.5
    - Erik – we need to ask ourselves: is this update useful for management? Is the model still relevant with the addition of 3 yrs of data?
    - Mike Prager – concerned with the how the model is fitting the two indices: both the PRFC and the JAI observed values are pretty much flat, but the model fit is a decreasing trend in both cases. It's disturbing that neither index is fit well in recent years, which is the time range most important for management measures.
        - Matt – appears the age composition fit is causing this

        - Doug B – have a couple of options for sensitivity analyses : 1) omit the PRFC because of a priori concerns…or 2) down-weight the age comp
    - Erik – before we discuss sensitivities, we need to decide if we're comfortable with the model as-is, and then explore the issues we've identified.
        - Doug B – the flip side is that we may need to explore sensitivities to be able to make the call as to whether the model is currently useful for management.
        - Erik – agreed, but we shouldn't focus on the model's robustness to stock status…we should focus on recruitment, biomass, etc.
        - Behzad – what do you mean by "comfortable"?
        - Erik – for example, let's say the last peer review identified issues that were deemed not critical at the time, so the assessment passed. If the additional data now make those same issues much more important (and might have caused the assessment to fail the previous review), we might then be "uncomfortable" with the model.
        - Erik – but to respect the assessment process, we would have to identify and defend a fairly major problem with the assessment to say that we now don't accept this (previously peer reviewed) model, given the current data.

Biological Reference Points

- Erik – we should address the mismatch between F and SSB ref points: F-BRPs are based on %SPR (board decisions), while SSB-BRPs were reported as SSBmed and SSBlimit during last benchmark assessment
- Alexi – we can't alter the BRPs in an update
- Erik – no, but we can offer alternative metrics with which to evaluate the stock that might be more consistent with recent changes in BRPs for this stock. Since F-based BRPs were recently decided upon by the board, we should focus on addressing the SSB-based BRPs
- Alexi – choices are to come up with BRPs using projections based on… 1) the full time series' of recruitment data or 2) a shortened (more recent) stanza of data (1990-2010…leaving out last, most variable year)**.**
- Erik, others – agreed, but best to do both and decide at a later TC meeting
- Alexi – concerned about the variability in the maturity-at-age impacting the SSB

Monte Carlo/bootstrap runs

- Erik – propose doing the same as with previous benchmark…basically to add uncertainty to: PRFC, JAI, reduction + bait landings, reduction + bait age comps
- Mike Prager – in a perfect world, you could also try to describe uncertainty in model structure

Identify sensitivity runs

- Previous (benchmark) sensitivity runs:

    - Time invariant M (single vector for all years)
    - PRFC CV=0.2
    - PRFC CV=0.8
    - Four separate JAI indices with internally estimated weights
    - Allow random walk parameters for PRFC
    - Omit JAI
    - Omit PRFC
    - GLM-based PRFC
    - M up and down by 25%
    - Avg of last 8 yrs of per-recruit BRPS
    - Avg of last 3 yrs for per recruit BRPs
    - No ageing error
    - Dome-shaped selectivity in 2004-2008 reduction
    - First year = 1964
    - Model estimated M scalar
    - Bev-Holt stock recruit curve
    - Ricker stock recruit curve
    - Retrospective analysis
- Erik – hopeful to whittle list down…need to keep in mind that we should have a specific reason to include each sensitivity run.
- Doug B – proposes narrowing the "input" sensitivity runs to three 1) omit JAI; 2) omit PRFC; and 3) down-weight the age comp
- Behzad – where is "capping the age-comp sample size at 200" sensitivity run in the list…I thought this was a standard run?
    - Erik – don't know, wasn't on the list
    - Behzad – we should add this one in
    - Erik – we have to be careful about adding in a run that wasn't done in benchmark. Need to be able to convey to the board a good reason for adding it
    - Doug B – instead of arbitrarily choosing 200 as a cap, use the model estimated effective sample size, average over years, and use that as a fixed value
    - Erik – [Reviews model estimated effective N for reduction fishery] much lower than actual effective N.
    - Matt – suggest going with median, not mean of model-estimated effective N
    - Behzad / others – agreed
- Matt – we should add in a retrospective analysis to see if the changes we've seen in assessment output is a property of the model or just a function of the additional data…propose going back 5 yrs?
    - Jay - wouldn't we want to go back to 2000, when the output started to diverge from previous run
    - Joe (VA) / others – makes sense
- Doug B – with the dome-shaped selectivity run, need to consider how we want to parameterize the "dome"…a double logistic? a negative exponential?
    - Erik – you're suggesting doing multiple dome-selectivity runs…probably best to choose just one…we don't have time to do iterations of sensitivity runs

    - Erik – purpose here is to explore how vulnerable the model is to our assumption of a flat-topped selectivity
- Alexi – what about adding M runs?
    - Matt – don't think this is necessary
    - Alexi – but this run had the largest impact in the benchmark
    - Doug B – if you already explored the behavior of the model with respect to M in previous sensitivity, it's probably not necessary to re-run these scenarios
- Derek – why was the 1964 start year run included last time?
    - Erik / Matt – omits the giant year classes of the 1950s
    - Jay – also the beginning of the PRFC
    - Doug B – if you tried a new start year run, suggests using something like 1985…because PRFC fits well pre-2000, while JAI fits well 1980s-on…should favor the fishery independent index over the CPUE index
    - Matt – problem with truncating the data to 1985 is there will be very little contrast in the data…you'll get a "one-way trip"
    - Erik – what would the reason be for doing this?
    - Doug B – only obvious reason is that the JAI fits the data best mid 1980s-on
- Committee decided to go with the following sensitivity runs
    - Omit JAI
    - Omit PRFC
    - Dome-shaped selectivity (double logistic) for reduction fishery (1994-2011) [board directive]
    - "downweight age comp": Use avg of effect sample size (computed from base run fits in all yrs) for age composition data in all years
    - Retrospective analysis: 10 years

Projections

- Board requested to project 10 years
    - Matt – this is not a good idea…all you will get is your stock recruitment pattern back. All of the fish in your age comp will have died off in 4-5 yrs…you're just dealing with "paper fish" after that.
- Plan is to initialize with MCB runs, as decided at the January TC meeting

Other Business

- Mike W – update on timeline
    - July 18th the assessment has to be completely finalized
    - Need to schedule a late June TC meeting…even though it's TC meeting week, we're the only TC meeting, so we can pick our own date. Mike will send a doodle for the week of June 18th.
    - Will discuss write-ups on the 5/29 webinar
- Matt – are we doing a constant F or constant landings projections?
    - Erik – we've done both in the past
    - Alexi – we've used constant landings in recent work

    - Doug B – keep in mind that small pelagic fisheries elsewhere in the world do not consider constant F or constant landings, since recruitment is typically environmentally-driven. It is more common to have an adaptive approach.
- Jeff – board will be interested in how any future cuts in harvest will be apportioned between the sectors (reduction v bait).
    - Mike W – the board is considering allocations based on historical proportions
    - Jeff – believes the board is also interested in examining scenarios where all of the cuts come out of a single sector (e.g. just the reduction fishery).
- Sulikowski's Aerial Survey
    - Alexi – this board directive was aimed at the full Menhaden TC…should this discussion wait for the full TC?
    - Erik – this makes sense to me…is this OK with the group?
    - Erik/Mike W - Will discuss this at the next in-face TC meeting (mid-late June).
    - Doug B – Dr. Sulikowski is in the process of fixing some errors and updating the text…he will update & distribute shortly.
    - Mike W - Will try to get Dr. Sulikowski to come and present these data to the group.