MEETING SUMMARY

Ecological Reference Point Work Group
November 28, 2023

Committee Members in Attendance: G. Nesslage, S. Madsen, M. Cieri, D. Chagaris, J. McNamee, M. Celestino, A. Sharov, A. Schueller, A. Buchheister, J. Boucher, and M. Dean

ASMFC Staff: K. Anstead, K. Drew, J. Patel

Public: Peter Himchak, Jaclyn Higgins

ERP Species/Candidate Species Updates
Menhaden, Spiny dogfish (K. Anstead)
For menhaden, fishery-independent data requests were sent out to various TC members to support the 2025 stock assessment update. In response to the work Nesslage presented at the October ERP workshop, individual weight data was requested from the states in addition to length data. For spiny dogfish, a workbook was created for inputs and outputs (e.g., fishing mortality, estimated biomass), survey lengths, the VAST index, and literature on movement as the assessment didn't have raw tagging data. The fecundity equations for 2-time blocks (length at maturity) were included, but Anstead was unsure if that is enough for the "egg production" the group is looking for. The workbook was sent to some spiny dogfish stock assessment scientists to get advice for meaningful grouping by sizing.

ERP members clarified that seasonal egg production should include an estimate of monthly reproduction. There was a follow up about the ageing workshop and how it will take until next August for the group to get more conclusive results about ageing paired samples of scale and otoliths.

Striped bass, Weakfish, Bluefish (K. Drew)
The striped bass assessment kicks off early next year (2024) for the data-gathering process. Weakfish is in the middle of this process (initial data has been pulled) and should be completed in 2024. The Bluefish update assessment is complete and a WHAM output has been requested from the NEFSC. Drew is still working on seasonal egg production for all three of these species.

Atlantic herring (M. Cieri)
Atlantic herring is going through a research track assessment on the same timeline as the ERP assessment. A management update is scheduled for beginning of 2024.

Bay anchovy (M. Celestino)
Bay anchovy needs an index of relative abundance through 2023. There was a question of whether there was a preference in using the NEFSC approach or the finer-scale MSVPA approach.

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Discussion revolved around work group members preferring indices of abundance that are survey-specific even if data is more inshore and harder to combine for a coastwide index. There was some debate about the merits of separating indices by regions and using all of the surveys that the group can find, but ultimately, due the fact that regions are a way to summarize the output and there are 13+ surveys, the group decided to determine which surveys had a consistent catch of anchovy and use those before separating them out by region based on where the surveys were being conducted. Recommendations were made to select surveys based on impact of species on primary predators. In this case, focusing on Chesapeake Bay or Delaware Bay because of striped bass and evaluating impact of each survey using percent 0s and start of years is recommended. Model calibration will start in summer of 2024, so the final inputs will need to be developed by then.

Zooplankton (Indicator Investigator WG – M. Celestino)
Last meeting, there was a consensus that the NEFSC's report on state of ecosystem would be helpful so that document was reviewed to find copepod abundance for a select number of species, total estimated regional biomass, and cnidarian abundance. Work is still being done to find more data sources. Celestino asked the ERP WG if the same amount of information for zooplankton (biomass, etc.) is needed as other groups or was a trend is enough?

Discussion concluded that a similar approach to anchovy should be taken and that for time series and spatial information, sub-areas can be independent from the way anchovy is set up because the model can attach a zooplankton trend to its own region. Additionally, having a total biomass estimate and a time series of relative abundance of biomass could be useful since current model values are outdated.

Benthic invertebrates (Indicator Investigator WG – M. Celestino)
Celestino noted that benthic invertebrates are a really big group so it may be worth using a constant or vary the input based on primary production. He will work with Chagaris to figure out how to tackle this large set of taxonomic groups.

Smooth dogfish (M. Cieri)
Smooth dogfish range from Cape Cod to Florida and overlap with menhaden. Smooth dogfish was assessed using SS34 via SEDAR with data through 2021. Most diet data in the literature across regions indicates that smooth dogfish consume mostly decapod crustaceans with little to no menhaden (may be a result of niche partitioning with spiny dogfish). The ERP WG is leaning toward not including this species in the model, but a final decision will be made at the next meeting.

Bluefin tuna (M. Dean)
Trawl surveys seem to have most of information on diet data, but most of it is summarized in the literature. Ecospace will need information to characterize spatial distribution of bluefin tuna as a seasonal predator within the NWACS spatial domain, since the range of bluefin tuna extends well beyond the Northwest Atlantic coastal shelf area. There is potential to get satellite tagging information for abundance, movement rates, and spatial distribution; Dean has reached out to researchers who've published on that subject to see if they would share data in some form. The

stock assessment for bluefin tuna was completed in 2021 (terminal year 2020). The next assessment will be in 2026, so the ERP WG will need projections to fill in gaps for abundance.

Nearshore piscivorous birds (A. Sharov, J. Patel)
Cursory literature search was conducted for five bird species after talking to Bryan Watts. The max menhaden consumption rates (100%) can be estimated by using Watt;s North Carolina paper to calculate kJs necessary to sustain bird life by species and region and then converting to metric tons of menhaden. The WG agreed that this approach could be useful to provide bounds on the inputs. Further discussion with Watts is needed for osprey.

Discussion revolved around including heron and other higher-level predators with smaller numbers like eagles.

Marine mammals (J. Patel, H. Townsend)
Patel noted that there was little to go off of in the literature for diet data for mammals and the studies that do exist are not always directly comparable to the studies on finfish predators. For example, they may not report menhaden to the species level, grouping them with other Clupeids, or may use genetic methods to identify stomach contents. Mammals are a large taxonomic group with a lot of different predators but few studies have any information on consumption rates.

The ERP WG discussed the utility of eDNA or DNA metabarcoding approaches compared to traditional stomach content analysis, and recommended that the genetic approaches should not be directly combined with measures of diet composition based on percent weight or percent volume from traditional stomach content analysis. However, genetic approaches could potentially be useful to partition the total Cluepeid diet composition from traditional stomach content into more species-specific metrics, along with information on the season, location, and year of the diet study. The ERP WG also recommended finding trends in abundance first for as many groups as possible and considering whether or not data collected from DNA metabarcoding was accurate and worth using if that is all is available for those species.

Diet Data Workgroup Update
This WG is still working on developing a data request for data on the scale that the models need. An ecosystem modeling approach is flexible enough to accommodate raw stomach content data if it has a high enough resolution. Initial conversations with VIMS indicated they would prefer to share summarized rather than raw data; the Diet Data WG will set up a call with VIMS and the modelers to identify the data format/summarization level that will be most useful.

VAST Masters Update
Anstead started to work on developing a VAST index for menhaden in the North Atlantic. The NJ index included January but it lagged it back a year and once she made that adjustment, the model did not run. She will continue to develop VAST indices for menhaden. Anstead also requested the spiny dogfish VAST code and input files from that assessment team but has not received a response yet.

Model Development Updates

For the VADER model, McNamee continues to work on the follow-up tasks discussed at the October ERP workshop. J. Collie from URI has been brought in to consult on the bottom-up feedback element of model development. McNamee and Nesslage (and Wilberg and Collie) will collaborate on the bottom-up feedback functionality of VADER, they intend on starting the collaboration in earnest in 2024.

For the NWCAS-MICE model, Chagaris is exploring using environmental conditions as a forcing function on primary production and recommended using the GLORYS dataset for that purpose. The GLORYS raster data was averaged by monthly timestep and the estimates from 1985-1993 still need to be backfilled. Seasonal patterns of predator-prey overlap is needed to start moving towards a seasonal NWACS-MICE model; this was estimated during 2014 MSVPA update for several key predator and prey groups, and Chagaris has done some initial work with that database, converting the seasonal vector to monthly using a time series spline smoother. The most critical needs currently include spiny dogfish data, seasonal overlap for prey by age/size groups (e.g., juvenile menhaden and herring), and overlap of ages for cannibals. Phytoplankton, zooplankton, and benthos will inherit some seasonal availability patterns once primary production forcing is included and trivial predator-prey interactions can be ignored.

Other Comments

The group will meet early in 2024 to determine which candidate species to include in the model.