Atlantic States Marine Fisheries Commission

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# MEMORANDUM

March 26, 2020

**American Eel Technical Committee Meeting Summary**

**TC Members**: Jordan Zimmerman (Chair; DE), Todd Mathes (NC), Jen Pyle (NJ), Ryan Harrell (GA), Pat McGee (RI), Robert Atwood (NH), Keith Whiteford (MD), Troy Tuckey (VIMS/VA; Vice-Chair*), Kim Bonvechio (FL), Mike Wicker (USFWS), Gail Wippelhauser (ME), Wendy Morrison (NOAA), Ellen Cosby (PRFC), Carol Hoffman (NY), Danielle Carty, Sheila Eyler (USFWS), Tim Wildman (CT)
**Troy Tuckey agreed to become Chair*

**SAS Members (*not on the TC*)**: Matt Cieri (ME), Jason Boucher (DE), Laura Lee (NC), John Sweka (USFWS)

**USGS Habitat Modeling Staff**: Ben Gressler, John Young, Heather Galbraith

**Staff:** Kristen Anstead, Kirby Rootes-Murdy, Heather Konell

**Public**: Jessica Best (NYDEC), Evan Ashe

The Commission's American Eel Technical Committee (TC) met via conference call on Thursday March 26 to review draft Terms of Reference and a tentative timeline for completing the 2022 benchmark stock assessment. The following is a summary of the group's discussion.

## Call Summary and Recommendations

### *Review Previous Stock Assessment and Consider Draft Terms of Reference for 2022 Assessment*

Kristen Anstead provided a summary of the previous assessment and current assessment planning. The 2012 benchmark stock assessment evaluated local, regional, and coast wide indices, as well as considered a number of modeling approaches. Trend analyses (Mann-Kendell, ARIMA, Manly) were the primary focus of the 2012 assessment that was approved by peer review and was updated through the 2017 stock assessment update. Information on the peer view comments can be found in the 2012 assessment report.

As part of planning for the 2022 assessment, Anstead presented draft Terms of Reference (ToRs). The ToRs included standard items for both the Stock Assessment Subcommittee (SAS)

to address in completing the assessment and for Peer Reviewers to evaluate the assessment. Both sets of ToRs are included after the summary. Jordan Zimmerman asked about how data from Canada would be used in the upcoming assessment and what level of communication has been maintained with Canada Department of Fisheries and Oceans (DFO). Anstead outlined that the ASMFC staff (Kristen as Peer Reviewer; Kirby as an observer) attended Canada DFO's Data Workshop in May 2019 in Ottawa and contributed to DFO's process in evaluating both US and Canadian data for their assessment purposes. In October 2019 Laura Lee (SAS member) attended the DFO Assessment Workshop in Halifax and contributed as a Peer Reviewer as well. DFO's efforts at a stock assessment focused on trend analysis used in the 2012 and 2017 ASMFC assessments. While there is currently no formal process established for Canada DFO to participate in the Commission's 2022 assessment, ASMFC staff will reach out to DFO and ask if a representative can participate and contribute data through the Commission's assessment process.

**The ToRs were approved by the TC to be forwarded to the Board is for approval via email vote.**

## *Consider Potential Data Sources and Review Draft Stock Assessment Timeline*

Next, Anstead presented on data used in the previous assessments and highlighted data needs for the 2022 assessment. Approximately 70 fishery independent surveys were evaluated in the 2012 benchmark; 19 YOY (young-of-year) and 14 yellow eel surveys were included. Previously used surveys, as well as any surveys that now qualify (e.g., minimum of 10 years of data, reliably catch American eel, collect environmental variables) will also be needed. All associated biological data (growth analysis) was used from those surveys will be needed again. YOY datasets by region were used as well; some have been discontinued, some may be able to be added. All YOY data will still be requested, even if the survey has been discontinued.

In terms of data format, more specific instructions will be provided in preparation of the Data Workshop. Generally, tow-by-tow raw data, tows with zero eel catches, environmental variables, and associated biological data (length, weight, age sex, etc.) will be requested. Additionally, fishery-dependent biological data, research projects that may have data appropriate for the assessment, and commercial landings (by life stage) validated through ACCSP will all be needed.

**Fishery-independent and –dependent data will be requested from the TC members to support the 2022 benchmark assessment.**

Given COVID-19, the previously scheduled American Eel Board Meeting for May has been cancelled and the Board will consider the ToRs and SAS nominations via email vote. Once the SAS has been approved by the Board, work on the assessment will begin later this summer. Based on feedback during the call, the current plan is for the terminal year of the assessment to be the 2019 fishing year due to 1) concerns 2020 sampling may be compromised due to current closures/ work disruptions/human health concerns and 2) ACCSP data would only be

available through 2019 by fall 2020. The tentative plan may be to add in 2020 commercial data at a later time in the process is possible. More information can be found in the timeline spreadsheet.

- Data workshop later in 2020 that includes both TC and SAS to help SAS better understand datasets and how best to use the data
- In 2021, assessment workshop prep in Jan-March and Assessment workshop in April or May followed by series of webinars and another assessment workshop in fall 2020.
- 2022 – finalize analyses and write report for by summer, TC will get draft assessment report in summer 2022 for review. Sending for peer review in late summer/early fall 2022. Present to Board in late 2022 at the Annual Meeting

**The timeline for the assessment was approved by the TC. The timeline is included below**.

Last, Anstead presented expectations of SAS members, previous SAS members (from 2012 and 2017), and current nominees. Sheila Eyler has agreed to be the SAS chair for the 2020 assessment. Current nominees are included below:

-Sheila Eyler (USFWS; Chair)
-Matt Cieri (ME)
-Jason Boucher (DE)
-Troy Tuckey (VIMS/VA)
-Laura Lee (NC)
-John Sweka (USFWS)
-*Keith Whiteford (MD)*
*Staff:* Kristen Anstead and Kirby Rootes-Murdy

Keith Whiteford indicated that he would be nominated to the SAS by MD DNR as well. No other TC members indicated they would be nominated. John Young (USGS) indicated he would continue to contribute and participate as an informal member of the SAS to address habitat needs through GIS analysis.

**SAS nominations above will be sent to the Board for approval by email vote.**

## *USGS Update on GIS Project*

John Young gave a progress update on the USGS GIS Project for American eel. Over the last several months, Young and USGS colleagues have been identifying data sources, assembling records of American eel, and categorizing records by presence, abundance, density, etc., from various databases. This work has been aided by data from the states (through outreach by Anstead) as well as separate collection of data from agencies (including Canada DFO) and online databases. With this data, Young and colleagues have been compiling data bases of environmental predictors to use in habitat modeling. Databases have been categorized as inland or tidal. Lastly, Young and colleagues have begun examining statistical modeling techniques appropriate to response variable type to assess the relationship between eel

presence and abundance against environmental characteristics. These techniques include random forest and logistic regression analyses.

The primary pilot studies will be the Chesapeake Bay and Delaware Bay watersheds given available data, specifically the lower portions and tributaries of each waterbody. Eel distribution and density appear to be linked to dam presence and distance to ocean, so both elements will be tracked through this work. As part of this, the passability of dams will be an important variable for consideration in analysis; Tim Wildman highlighted that passability also differs by life stage and dam characteristic, and such evaluating this complexity will be challenging.

Young and colleagues hope to have preliminary work completed on the pilot study completed by this fall.

## *Elect TC Chair and Vice-Chair*

Next Kirby Rootes-Murdy outlined the need to fill both the TC Chair and Vice-Chair positions. Ellen Cosby was unable to continue on as Vice-Chair, so both position were vacant. The TC Chair will be important over the next two years for both leading TC calls and meetings as well as being a member of the SAS. **Troy Tuckey agreed to become TC Chair**. Dani Carty of SC indicated she would consider becoming Vice-Chair.

## *Other Business- Update on YOY surveys in 2020*

At the request of Zimmerman, states provided a brief update on their state's YOY survey in 2020. Given COVID-19 has shuttered many state agencies there was concern that YOY surveys may be impacted. While a number of the state surveys will adjust their schedule, nearly all states plan to continue the survey in 2020. Below is brief feedback from each state:

- **FL** – finished 3rd week of February
- **GA** – no longer have YOY survey (yellow eel survey only), abbreviated sets in Jan and Feb did not due March due to flooding, survey only done Jan to March
- **SC** – YOY survey is year-round, being delayed because of work at home order, will sample as soon as allowed
- **NC** – Survey handled by NOAA in Beaufort Inlet – no updates to indicate sampling isn't happening
- **VA** – have been sampling thus far and plan to continue to sample. Eels just starting to show up and plan to survey until told they need to cease field work
- **DC**- spring elver survey is on hold indefinitely until staff is allowed to resume field work; the same is true for the adult surveys. The elver survey usually starts April 1 and encompasses 10 weekly surveys, usually ending the second week of June.
- **MD** – starts in January, but sampling had to stop for past two weeks, heart of season now and through April that won't be assessed
- **DE** – starts in January, completed last week, catches better than average and better than last year
- **PA**- no update
- **NJ** – Sampled 2nd week of Feb and got 4 weeks of sampling before ordered to remove gear, they are in peak now until mid-April

- **NY** – full survey with biological data started in late February; modified to a sampling count only survey for past two weeks
- **CT** – use Irish elver ramp was deployed early because of mild winter, sampling still continues to weigh catch only to estimate catch numbers, but no biological samples
- **RI** – ramps scheduled to go in next week Apr-July, plan is still to deploy unless ordered otherwise
- **MA** – no update
- **NH** – sampling starts in April, still planning to start on time. One station relies on volunteers for checking
- **ME** – Delayed elver season until further notice, ramps being deployed now for YOY sampling, plan is to sample until ordered not to

MA TC member was not present on the call; PA is currently without a TC member. ASMFC Staff will follow up with PA staff.

Last under other business, Heather Konell of ACCSP provided an overview of data considerations for the compiling commercial landings data. All TC members should work to get their confidential data access up to date; given it can take a while for the process to be completed its suggested that TC members request access ASAP. As of the call, commercial landings data for 2019 was still missing from PRFC and NC. PRFC staff indicated on the call that they intend to get the data to ACCSP by next week. Last, similar to the TC, all SAS members need to request confidential data access ASAP.

# TERMS OF REFERENCE

For the 2022 ASMFC American Eel Benchmark Stock Assessment

**Board Approved**
**June 2020**

***Terms of Reference for the American Eel Assessment***

1. Define population structure based on available data. If alternative population structures are used in the models (e.g., coastwide, regional, sub-regional or estuary-specific), justify the use of each population structure.

2. Characterize precision and accuracy of fishery-dependent and fishery-independent data used in the assessment, including the following but not limited to:
    a. Provide descriptions of each data source (e.g., geographic location, sampling methodology, potential explanation for outlying or anomalous data).
    *b.* Describe calculation and potential standardization of abundance indices. Consider the consequences of environmental factors on the estimates of abundance or relative indices derived from surveys.
    c. Discuss trends and associated estimates of uncertainty (e.g., standard errors).
    d. Justify inclusion or elimination of available data sources.

3. Develop models used to estimate population parameters (e.g., *F*, biomass, abundance) and biological reference points, and analyze model performance.
    a. Briefly describe history of model usage, its theory and framework, and document associated peer-reviewed literature. If using a new model, test using simulated data.
    b. Describe stability of model (e.g., ability to find a stable solution, invert Hessian)
    c. Clearly and thoroughly explain model strengths and limitations.
    d. Justify choice of CVs, effective sample sizes, or likelihood weighting schemes.
    e. If multiple models were considered, justify the choice of preferred model and the explanation of any differences in results among models.

4. Characterize uncertainty of model estimates and biological or empirical reference points.

5. Perform sensitivity and retrospective analyses.
    a. Perform sensitivity analyses for starting parameter values, priors, etc. and conduct other model diagnostics as necessary.
    b. Assess magnitude and direction of retrospective patterns detected, and discuss implications of any observed retrospective pattern for uncertainty in population parameters (e.g., *F*, SSB), reference points, and/or management measures.

6. Recommend stock status as related to reference points (if available). For example:
    a. Is the stock below the biomass threshold?
    b. Is *F* above the threshold?

7. Other potential scientific issues:
    a. If traditional assessment models cannot be used due to data limitations, consider other novel approaches to assess the stock and provide advice to managers such as habitat modeling, data limited models, or trend analyses.
    b. Evaluate new information on life history such as characterizing length, weight, age, and sex structure, distribution, spawning, or maturation. Explore possible impacts of environmental change on life history characteristics.

8. Develop detailed short and long-term prioritized lists of recommendations for future research, data collection, and assessment methodology. Highlight improvements to be made by next benchmark review.

9. Recommend timing of next benchmark assessment and intermediate updates, if necessary relative to biology and current management of the species.

10. If a minority report has been filed, explain majority reasoning against adopting approach suggested in that report. The minority report should explain reasoning against adopting approach suggested by the majority.

***Terms of Reference for the American Eel Peer Review***

1. Evaluate the definition of the stock structure used in the assessment.

2. Evaluate the thoroughness of data collection and the presentation and treatment of fishery-dependent and fishery-independent data in the assessment, including the following but not limited to:
    a. Presentation of data source variance (e.g., standard errors).
    b. Justification for inclusion or elimination of available data sources.
    c. Consideration of data strengths and weaknesses (e.g., temporal and spatial scale, gear selectivities, aging accuracy, sample size).
    d. Calculation and/or standardization of abundance indices.

3. Evaluate the methods and models used to estimate population parameters (e.g., *F*, biomass, abundance) and biological reference points, including but not limited to:
    a. Evaluate the choice and justification of the preferred model(s). Was the most appropriate model (or model averaging approach) chosen given available data and life history of the species?
    b. Evaluate model parameterization and specification (e.g., choice of CVs, effective sample sizes, likelihood weighting schemes, calculation/specification of *M*, stock-recruitment relationship, choice of time-varying parameters, plus group treatment).
    c. Recommend best estimates of stock biomass, abundance, and exploitation from the assessment for use in management, if possible, or specify alternative estimation methods.
    d. If multiple models were considered, evaluate the analysts' explanation of any differences in results.

4. Evaluate the methods used to characterize uncertainty in estimated parameters. Ensure that the implications of uncertainty in technical conclusions are clearly stated.

5. Evaluate the diagnostic analyses performed, including but not limited to:
    a. Sensitivity analyses to determine model stability and potential consequences of major model assumptions.
    b. Retrospective analysis.

6. Evaluate stock status determination and reference points used by the assessment.
    a. Recommend stock status determination from the assessment, or, if appropriate, specify alternative methods/measures.
    b. Evaluate the choice of reference points and the methods used to estimate them.

7. Evaluate the incorporation of new information stock or attempts at novel approaches to assess the stock.

8. Review the research, data collection, and assessment methodology recommendations provided by the TC and make any additional recommendations warranted. Clearly prioritize the activities needed to inform and maintain the current assessment, and provide recommendations to improve the reliability of future assessments.

9. Recommend timing of the next benchmark assessment and updates, if necessary, relative to the life history and current management of the species.

10. If a minority report has been filed, review minority opinion and any associated analyses. If possible, make recommendation on current or future use of alternative assessment approach presented in minority report.

11. Prepare a peer review panel terms of reference and advisory report summarizing the panel's evaluation of the stock assessment and addressing each peer review term of reference. Develop a list of tasks to be completed following the workshop. Complete and submit the report within 4 weeks of workshop conclusion.