New England Fishery Management Council
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John F. Quinn, J.D., Ph.D., *Chairman* | Thomas A. Nies, *Executive Director*

MEMORANDUM

DATE: May 29, 2020

TO: **Executive Committee**

FROM: Tom Nies, Executive Director

SUBJECT: **Atlantic Cod Stock Structure – Next Steps**

At the June 2020 Council meeting, the Council will receive the report of the Atlantic Cod Stock Structure Working Group (ACSSWG), as well as the peer review of that report. In brief, the conclusion is that our view that there are two biological cod stocks should be rejected for a different approach supported by several lines of evidence. This is the culmination of an effort that began in 2012. Council members and the public are likely to ask "What's next?"

The process outlined for this effort envisioned a three-phase effort. In brief, the phases are:

- Phase I – review and synthesize available data, test the "null hypothesis" of the existing structure, and determine if there are more likely spatial configurations
- Phase II – summarize the practical limitations of changing stock structure for both science and management; analyze the advantages and disadvantages of the status quo or adopting a different spatial configuration
- Phase III – Coordinate new assessments on new stock units, if warranted

Phase II asks both management and science questions. This phase needs to be pursued fairly quickly so that the appropriate plans can be made for the cod research track assessments scheduled for fall, 2023. The Committee should note that revising the way the stocks are assessed is one of several reactions to the new understanding of stock structure. Quoting Kerr et al. (2017), approaches used in similar situations include:

> "(i) Status quo management—there is insufficient information to change the current management practices.
> (ii) "Weakest link" management—there is some knowledge of spatial structure, but insufficient information exists to explicitly manage all spawning components. The assumed weakest spawning component is protected through management measures.

(iii) Spatial and temporal closures—there is knowledge of spatial structure, but insufficient information exists to alter the scale of assessment. Spatial and temporal closures are used to protect spawning populations.
(iv) Stock composition analysis—there is knowledge of stock mixing, but insufficient information exists to explicitly model connectivity within a stock assessment. Stock composition data are used to parse data (catches or samples) to the appropriate stock of origin before being input to the stock assessment or used in management.
(v) Alteration of stock boundaries—sufficient information is available on population structure and unique harvest stocks exist, which allows updating and redrawing stock boundaries to improve the alignment of biological populations and management units."

As further noted, the reaction can be grouped into three broad categories: (i) changing the scale of the stock assessment or parsing "mixed" data prior to use in the assessment, (ii) changing the scale of management, or (iii) changing both the scale of assessment and management.

If the decision is made to change how stocks are assessed, the management system may need to be modified as well. The Council may want to implement management changes in May 2024 in order to take advantage of the 2023 research track assessment results.

After the stock structure report at the Council meeting, I recommend the Council authorize the Chair to work with the NEFSC to form two working groups. One will address the assessment questions and one will address the management questions. The two groups should report back to the Council in January 2021.

Kerr, L. A., Hintzen, N. T., Cadrin, S. X., Clausen, L., Worsøe Dickey-Collas, M., Goethel, D. R., Hatfield, E. M.C., Kritzer, J. P., and Nash, R.D.M. Lessons learned from practical approaches to reconcile mismatches between biological population structure and stock units of marine fish. – ICES Journal of Marine Science, 74: 1708–1722.