Re-evaluating the spatial basis for management of Atlantic cod

Proposed work plan

NEFMC Scientific and Statistical Committee

February 27, 2012

Overview

We propose a three-phase process for re-evaluating, and possibly revising, the spatial basis for assessment and management of Atlantic cod, including the following objectives at each step:

Phase I

- Summarize the potential implications of defining inappropriate stock boundaries and ignoring sub-stock structure within stock units, as well as the potential advantages and disadvantages for both science and management of revising the status quo units, in order to provide a commonly understood rationale for this investigation.
- Overlay tagging, genetic, life history, and other data on the current management units to estimate rates of mixing and, conversely, independence and evaluate key assumptions of assessment models, essentially testing the "null hypothesis" of the status quo configuration.
- Develop a synthesis of those same tagging, genetic, life history, and other data to determine whether one or more alternative spatial configurations are more likely than the status quo. This synthesis should include the Gulf of Maine, George's Bank, the Mid-Atlantic Bight, and the Scotian Shelf.
- Characterize the mechanisms that drive spatial finer scale dynamics of cod populations and the fishing fleet, including habitat status and distribution, behavioral diversity, oceanography, predator-prey dynamics, and other factors.
- Provide advice on spatially-explicit management goals and strategies based on the synthesis of processes driving finer scale patterns, whether a new spatial configuration is adopted or not.

Phase II

- Summarize the practical limitations of changing stock units for both science and management.
- Analyze the advantages and disadvantages of either maintaining the status quo or adopting different spatial configurations through simulation modeling.

Phase III

- Conduct new assessments on new stock units, if warranted.

Since the need for Phase II is contingent upon the outcomes of Phase I, and likewise the need for Phase III is contingent upon the outcomes of Phase II, the work plan proposed herein focuses on Phase I only, although we propose objectives for all phases.

Proposed timeline for Phase I

(Note: Timeline based loosely on the process for a benchmark stock assessment.)

Feb. 27:	Revised plan submitted to NEFSC.
March 12-16 (3-4d):	Combined industry meeting (1 d) + data meeting (2-3 d)
March 19 – April 20 (5 wk):	Data acquisition and preparation
April 23 - 27 (2-3d):	"Models" meeting (i.e., methods for analysis & synthesis)
May 7 – June 15 (6 wk):	Application of methods
June 18-22 (2-3d):	Review of results; determine revisions as needed
June 25 – Aug. 3 (6 wk):	Revised analysis
Aug. 6-10 (2-3d):	Review and finalize outcomes

Capacity needed for Phase I

- 1-3 dedicated analysts working full-time on this issue.
- Work group/advisory panel including one or more experts[1] in:
    - Population genetics.
    - Tagging studies.
    - Life history traits.
    - Behavior.
    - Oceanography.
    - Other stock identification approaches (e.g., morphology, parasites, otolith composition)
    - Habitat.
    - Trophic interactions.
    - Stock assessment, esp. spatially structured.
    - Spatial ecology/theory.
    - Spatial modeling.
    - Fishing behavior, esp. spatial patterns.

[1] Involvement of Canadian experts will be important given the need to address linkages to the Scotian Shelf.