New England Fishery Management Council
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MEMORANDUM

DATE: November 2, 2015

TO: EBFM Committee

FROM: Andrew Applegate, EBFM PDT chair

SUBJECT: **Example Fishery Ecosystem Plan (eFEP) Prototype**

Supporting documents:

3b) Key Characteristics of Ecosystem Models and Supporting Analyses Applied to Northeast Region Marine Species

3c) Strawman Hierarchical structure: Overarching Goal, Strategic Objectives, Operational Objectives, & Desirable Management Components

3d) NEFMC Risk Policy and strawman EBFM goals and objectives

3e) Summary of Fishery Ecosystem Plan Components

At the recommendation of the Ecosystem Based Fishery Management (EBFM) Committee, the New England Fishery Management Council decided to develop an Example Fishery Ecosystem Plan (eFEP) for testing, validation, and engagement with the public and stakeholders. The Council also charged the EBFM PDT with the technical lead to develop an eFEP. The Council motion was:

That the Council prepare:

1. A policy describing goals and objectives, and approaches, for taking account of ecosystem processes in fishery management, and

2. An example of a fishery ecosystem plan that is based on fundamental properties of ecosystem (e.g., energy flow and predator/prey interactions) as well as being realistic enough and with enough specification such that it could be implemented. The example should not be unduly constrained by current perceptions about legal restrictions or policies.

3. With respect to number 2, it is understood that the example might not be implemented, but it should make clear what a fishery ecosystem plan would actually entail and it should focus debate. To the extent practicable, these documents should be completed in about one year. In consideration of these documents, the Council will adopt a plan for implementation. The EBFM PDT will have the technical lead in developing these documents and the EBFM

committee will recommend the documents for Council consideration.

The PDT began work on this task in September 2015, after the PDT had provided the Council with scientific advice on the harvest control rule for Atlantic herring. So far, the PDT has only had three meetings to work on eFEP development, but these meetings have been very productive.

Feedback and guidance is needed on our progress so far, so that the developing eFEP is consistent with management views and Council priorities. The PDT will use this input from the Committee and Council to refine the approach and provide greater detail about the developing eFEP prototype. This detail may include more information about potential management units based on common fishery characteristics and how they might be structured and managed within the context of an ecosystem production unit. The EBFM PDT will also provide more information about how the various ecosystem models that are under development could be applied and how they relate to the goals and estimated provision of ecosystem services.

Two PDT meetings focused on development of strawman goals and objectives and development of an initial eFEP framework. The PDT also held a third meeting in September to understand the present status and technical details of the ecosystem models that have been applied to Northeast Region stocks. Document 3b summarizes the characteristics of the models and supporting analyses that were presented to the PDT. All of these ecosystem models are in some form of development and none that have been applied to the Northeast Region stocks have yet had a formal peer review for their use to support EBFM. For this type of peer review, researchers and modelers also need information about the eventual eFEP goals and objectives and how the models will fulfill the information needs with respect to them.

On the other hand, the PDT made substantial progress on eFEP development and feedback and guidance is needed from the EBFM committee. At the November 10th meeting, the EBFM is presenting only a strawman and conceptual prototype. There is considerable work to be done and details to be filled in before an eFEP has been completed, but the PDT didn't want to proceed further without feedback and guidance from the EBFM Committee or the Council.

The first eFEP product that the PDT is offering is a structured, hierarchical list of goals and objectives (Document 3c), resulting from a brainstorming session conducted by the PDT and additional work to put it into the context of Magnuson Stevens Act (MSA) mandates and the Council's Risk Policy Roadmap (http://s3.amazonaws.com/nefmc.org/150818.Risk.Policy.Road.Map.Draft.pdf).

The strawman goals and objectives begin with an overarching goal and six strategic goals, categorized by type of ecosystem service. The goals (see list below) are intended to describe measureable outcomes. These strategic goals are listed but not yet ranked or given relative weights that reflect the Council's management priorities, which will eventually account for inherent tradeoffs between them. Until we begin the validation and testing phase using management strategy evaluation, it is too early to apply weights or rankings but the Committee and Council should ensure that their scope is satisfactorily articulated and sufficiently comprehensive to capture whatever priorities that the Council may have.

Overarching Goal

To protect the ecological integrity of US marine resources as a sustainable source of wealth and well-being for current and future generations.

Strategic Goals (Derived from Magnuson definition of OY as in Risk Policy Document):

I. Optimize Food Provision
II. Optimize Employment
III. Optimize Recreational Opportunity
IV. Optimize Intrinsic (Existence) values
V. Optimize Profitability
VI. Encourage stability in both the biological and social systems

Following the goals is a list of objectives or general strategies that describe the ways to achieve the above goals. These objectives are categorized as follows:

A. Strategic ecosystem objectives

B. Operational Objectives (SMART: Specific, Measurable, Achievable, Relevant, Time-bound)

C. Management Components

To help the Committee and Council understand these goals and objectives better, Document 3d associates the strawman eFEP goals and objectives with the Council's Risk Policy Roadmap goals. Even though the Roadmap focuses on specification risk management, the Roadmap also discusses risk management in a broader context (for example habitat and ecosystem concerns). Thus the ecosystem goals developed by the PDT are also familiar to the Council and related to its general risk management policy.

During the development of an eFEP prototype and strawman goals and objectives, it became apparent that there were some common themes shared amongst the PDT members and others attending the PDT meetings, which are listed below. Two important concepts among the common themes below are addressing spatial processes at smaller scales less than a large ecosystem production unit (or EPU; see map below) and stakeholder involvement and transparency.

Common themes

i. Promote species diversity – robustness to change

ii. Account for the value of ecosystem services (including intrinsic value) in addition to extractive value

iii. Increase stakeholder involvement and transparency at appropriate spatial scales

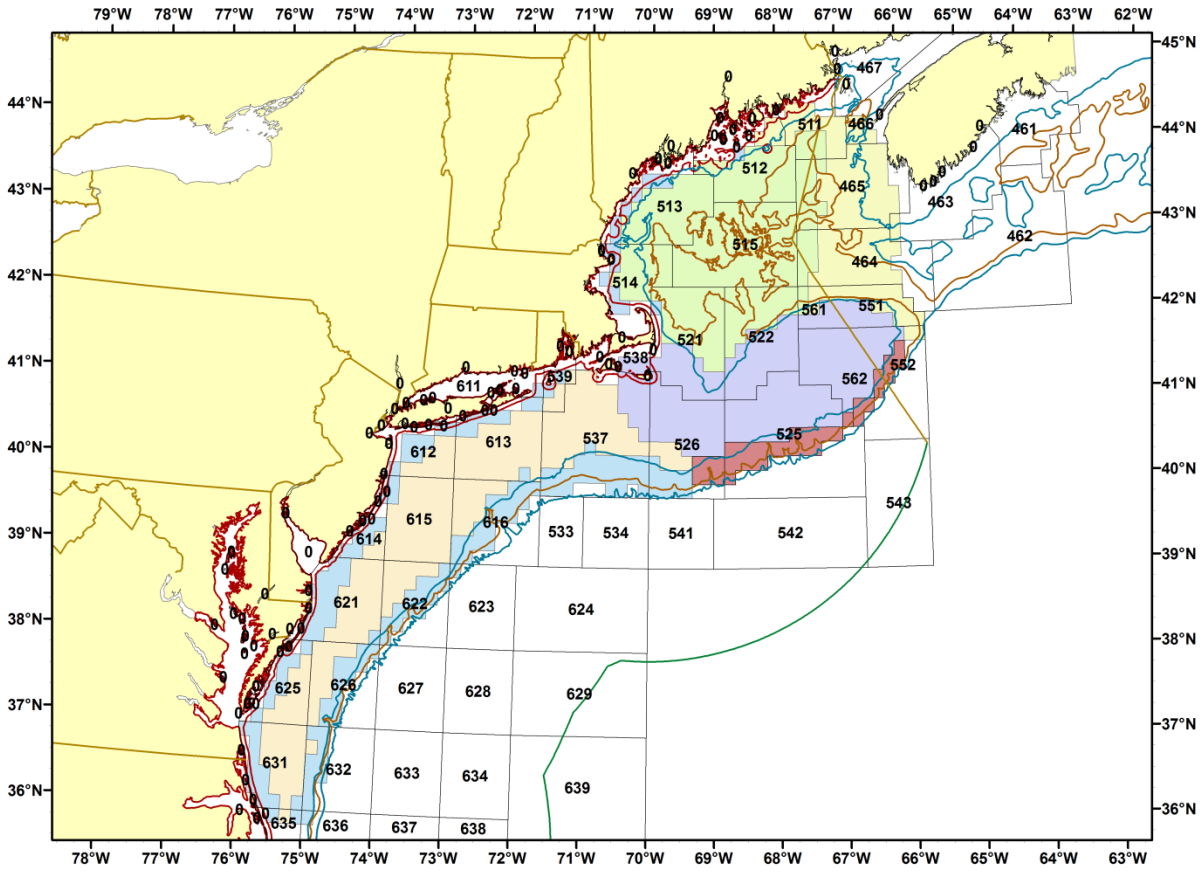
iv. Adopt adaptive management procedures to respond to changes caused by climate effects and other processes

v. Consider broad measures of ecosystem health and balance, instead of a sum of biomasses of managed fishery species

vi. Account for biological, physical, economic, and social processes at a variety of spatial scales

It is very important that EBFM is a place-based concept and will require coordinated management over a range of marine species that are trophically-related in an ecosystem. Derived from the distributions of related species, example EPU boundaries are shown in Map 1.

Map 1. Example of EPU boundaries in comparison to existing three-digit statistical catch reporting areas which are used to define stock boundaries[1].



Based on these common themes, the eFEP framework that the PDT developed as a prototype proposes a sub-EPU management unit (MU) where these smaller scale processes can be addressed through technical measures and MU catch allocations. One or more MU could be defined in a larger EPU, but individually could not overlap more than one EPU. Fishermen and other stakeholders would need to be closely involved in determining the technical measures to be applied within an MU, thus it is important to define an MU based on common characteristics and interests of fishermen and stakeholders. It will also be important to obtain buy-in from and cooperation with US and Canadian fishery management authorities for EBFM to be effective.

[1] Fogarty, M.J., R.Gamble, K. Hyde S. Lucey, C. Keith, 2011. Spatial Considerations for Ecosystem-Based Fishery Management on the Northeast U.S. Continental Shelf. In (D. Packer, Ed.) Proceedings of the Mid-Atlantic Management Council's Habitat-Ecosystem Workshop, NOAA Tech. Mem. NMFS-F/SPO-115 pp 31-33.

Lastly, the PDT constructed a prototype framework of eFEP components (Document 3e) that provide a structure for how the Council (and related fishery management authorities) could implement EBFM. The proposed general framework includes six categories (see list below). Although this document provides a structured framework for managing ecosystem effects at various spatial scales, policy guidance is needed and further work will be needed before the finer details emerge.

Summary of eFEP framework (see Document 4 for more detail):

1) Goals and objectives

   Goals and objectives would apply throughout the managed ecosystem and could be consistent across different ecosystems, but may have differing emphasis in each.

2) Scope

   Describes the geographic, biological, economic, and social boundaries that apply to #3 and #4 below

3) Ecosystem processes (EPU)

   Description of trophic relationships, ecological reference points, and limits that apply to the EPU.

4) Marine Resource and Fishery Management Units (MU)

   Technical measures and management structure to achieve desired outcomes at sub-EPU spatial scales.

5) Research and Ecosystem Monitoring

   Description of sampling and monitoring needed to assess and manage ecosystem effects.

6) Affected Environment

   Detailed description of the ecosystem being managed by the FEP.