



## New England Fishery Management Council

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# DRAFT MEETING SUMMARY

## Ecosystem Based Fishery Management (EBFM) Committee

Hotel 1620, Plymouth, MA 02360

April 14, 2016

The EBFM Committee met on April 14, 2016 in Plymouth, MA to receive a progress report on the development of a draft example Fishery Ecosystem Plan (eFEP), review and discuss suitable goals and objectives for an FEP, provide guidance and feedback to the PDT for continuing development efforts, and discuss the use of an Advisory Panel and future public scoping.

**MEETING ATTENDANCE:** John Pappalardo (Chairman), Dr. Matthew McKenzie (Vice Chair), Mary Beth Tooley, Dr. Michael Sissenwine, Terry Alexander, and Jeff Kaelin (MAFMC); Andrew Applegate (NEFMC staff); Tobey Curtis (NMFS GARFO staff); and Mike Fogarty (NEFSC). In addition, nine members of the public attended.

Presentations and background documents are available on the Council's EBFM web page (<http://www.nefmc.org/calendar/apr-14-2016-ebfm-committee-meeting>).

### **KEY OUTCOMES:**

No motions were made during the meeting, but the committee developed consensus recommendations for the EBFM Plan Development Team (PDT), made changes to the draft strawman example FEP goals and objectives, and discussed the function and timing of a potential Advisory Panel.

PDT guidance to focus eFEP development on the following steps (tasked by consensus):

1. Describe a trophic web area based operating model that specifies:

- an ecosystem area
- species present in the area that will be dynamically model
- species present in the area that will be treated as externalities (they participate in the food web, but their numbers and biomass is determined outside the model- e.g., mammals, birds, most benthic invertebrates)
- feeding models that account for preference, suitability and availability
- matrix of production attributable to ecosystem area (incorporating seasonality)

- stochastic nature of these relationships- could use Bayesian approach
2. Test alternative approaches to management including
    - current single species approach
    - guild (trophic level) approach
    - Total ecosystem productivity approach
  3. For each approach, specify:
    - criteria for overfishing
    - rebuilding strategy
    - mechanism to protect most targeted or vulnerable stocks (min, biomass, but not necessarily linked to  $B_{MSY}$ )

The committee discussed and revised the strawman goals and objectives in the FEP components document. These changes will be prepared for further discussion at the April Council meeting.

The committee also discussed the timing and function of a future Advisory Panel to assist the Council with evaluating an example FEP for Georges Bank.

### Introduction

Mr. Pappalardo described the purpose of the meeting and a brief summary of some of the issues and difficulties that had been encountered. He also described the concern about the different approaches that the New England and Mid-Atlantic Councils were taking and a recent conference call between the Council and Committee chairs, the Executive Directors, and relevant Council staff members. He said that the PDT had made progress on a daunting task, but it looked like we were not going to get a draft eFEP done in the time that had originally been anticipated, i.e. delivering an eFEP description by June.

Mr. Applegate started the report presentation with an overview and background on the work the committee had done, the charge that the Council had given in 2015 to the Committee and PDT, and how it was related to the 2011 SSC White Paper, previous Council EBFM priorities, and national policy.

The committee discussed the different approaches being taken by the Councils, EAFM in the Mid-Atlantic, setting an ecosystem total cap on removals in the Bering Sea and Aleutian Islands, and the NEFMC focus on development of a place-based FEP. Although the Council is attempting to develop a different approach, there is common ground between the MAFMC and NEFMC approaches. In the end, certain elements of an FEP might be implemented as an EAFM approach like the MAFMC is pursuing. Mr. Kaelin said that at this juncture, it would be a good idea for the Councils to explore a couple of different roads to ecosystem management.

Mrs. Tooley asked about what the focus or the task of the committee should be at this point, recommending that the committee focus on what kind of product the Council would like to see. This would give the PDT the type of guidance and feedback that is needed.

#### Public comment

Mr. Smolowitz commented that there were three potential approaches: build a new structure at a different place, tear down and rebuild a structure in the current place, or renovate it. He related the latter to combining plans and revising or erasing stock boundaries, which is the approach that he supports.

### ***AGENDA ITEM 1– PDT PROGRESS REPORT AND OVERVIEW***

#### Presentation

Mr. Applegate described the focus of recent PDT work since the Committee and Council met in December. Two PDT meetings and a conference call were held, the latest on March 29-30 and one meeting had been cancelled due to conflicts that PDT members had. He said to add support and broaden the field of experience on the PDT, the Council added David Stevenson, Daniel Palmer, and Sean Lucey to the membership, which now numbers 14.

Working from Document 2, Mr. Applegate gave a summary of the PDT's progress and concerns/issues that the PDT had encountered, when beginning to draft a series of related discussion documents to demonstrate how an FEP could work. Due to the relative amount of available ecosystem models, the PDT had begun to focus on developing the eFEP for a Georges Bank Ecosystem Production Unit, although the idea was that the eFEP could serve as a template or prototype for other areas. Mr. Applegate reported that during the PDT discussion there was agreement about five general principles:

- Reference points and catch limits for an Ecosystem Production Unit (EPU) should be informed by trophic relationships and interactions, tied to the Council's risk policy that recognizes both uncertainty and potential consequences of mis-specification.
- A total system cap - The combined catch limits of all species or functional groups should not exceed a fixed percentage of primary production, about 40%.
- Aggregate, functional groups - Stocks should be managed in functional groups of ecologically related species (i.e. guilds), but individual stocks require special conservation if they become overfished or depleted.
- Management should be applied through a hierarchical place-based (i.e. spatial) framework
- A place-based management approach coupled with catch limits defined at the functional group level could be more robust to climate-induced changes in productivity and distribution.

The PDT had been focusing on five different facets or features of the draft eFEP, discussing the issue that managers and scientists would need to consider as the plan developed. These facets were presented and discussed in the following order:

- Total system catch cap and functional group catch limits
- Overfished or depleted stocks
- Forage Fish Management
- Habitat Conservation and Spatial Management
- Management Strategy Evaluation (MSE)

### Discussion

The committee thought that the PDT had been making progress on what it had been tasked to produce, prepare a document describing what an eFEP would look like, but that the June timeframe had been optimistic and the issues that the PDT would encounter were at the time unknown. The committee recognized that issues like permitting, jurisdiction, and allocations could sidetrack the process, although they would eventually be important and are currently issues that are addressed on all current plans. Dr. Sissenwine thought that the initial focus should be on what is different about EBFM, what is scientifically realistic about MSY and productivity and how to interpret the Magnuson Act requirements in a more scientifically-grounded way. He thought what is needed is a tangible description of MSY and catch limits (ACLs) from an ecosystem basis.

### ***AGENDA ITEM 1A– PDT PROGRESS REPORT AND OVERVIEW: TOTAL SYSTEM CATCH CAP AND FUNCTIONAL GROUP CATCH LIMITS***

#### Presentation

Mr. Applegate explained that the PDT began discussion on a strategy to identify a total system catch cap which would be a fraction of the primary productivity, estimated by an ecosystem production model. This would define a maximum sustainably yield (MSY) for the EPU. Using an illustrative diagram in Document 2, Mr. Applegate explained that various multispecies models could be used to provide catch advice on a functional group or guild aggregation, but that these functional groups had not yet been described for a Georges Bank EPU. Table 2 in the document gave a ranked list of species caught on Georges Bank during observed trips, showing who managed them or whether the species were unmanaged. He said that some thought that the FEP could set catch limits only for NEFMC species, or only for groundfish, but the contribution of other species, either managed by others or unmanaged, would need to be recognized in setting catch limits.

Mr. Applegate said that the functional groups could be defined based on the following considerations: trophic characteristic, body size, maximum age and age at maturity, and fishery interactions (separating species caught with different gears or fishing fleets). It was presently unclear how the models would be combined or considered to provide catch advice, or how and whether single species assessments would be used to augment the evaluation of species that are in the ecosystem models. He also explained that some models were capable of providing tactical (i.e. catch) advice, while more complex end-to-end models were more suited to providing

strategic advice. There was not yet a description of how these models could be used to develop catch advice on an ecosystem or functional group level.

### Discussion

The committee liked the general concept of a functional group framework for setting EPU catch limits, but had questions and wanted to see more details about the functional groups to be proposed. The committee discussed whether in this context that the currently unmanaged species would remain unmanaged, become managed under the FEP, or would be an 'ecosystem component'. Mr. Curtis pointed out that the FEP had to acknowledge and evaluate the role of unmanaged species in the total system cap. Mr. Kaelin added that similar issues had come up with the MAFMC's unmanaged forage fish amendment and the approach they were taking was to define those species as ecosystem components, which would not require the Council to set ACLs or develop accountability measures for them.

### ***AGENDA ITEM 1B– PDT PROGRESS REPORT AND OVERVIEW: OVERFISHED OR DEPLETED STOCKS***

#### Presentation

Mr. Applegate reported that the PDT had begun discussing how to define when a species or stock had become overfished or depleted. He said issues included whether it would mean that new minimum biomass thresholds defined on ecological, rather than single species productivity, would be redefined or whether the existing ones would be appropriate in an ecosystem context and adequate. Also in the context of ecosystem management, it was not clear what the goals and objectives of rebuilding an overfished species would be, a target such as  $B_{MSY}$  might not be the appropriate target. It might be something entirely different such as restoring an optimal proportion of species biomass in a functional group.

For a key ecosystem species that had lower productivity, a threshold might be defined at a different level compared to one that wasn't a key species with high resilience. Thus the reference points might be defined on the basis of ecosystem risk or possibly on the basis of the proportion of that species biomass in a functional group. The PDT also raised questions about how status would be determined if assessments were done on a functional group basis. Status determination might still require single-species assessments, but might be determined through indicators from surveys and/or CPUE-based indicators. The PDT also had questions about status determination for seasonally migratory species and species that were not sampled well by the survey trawl, for example sand lance.

#### Discussion

Dr. Sissenwine stressed the importance of the last paragraph on overfishing and status determination. It pointed out that an FEP could have reference points defined in an ecologically meaningful way, with more realistic outcomes, recognizing the overall integrity of the system. He thought that the PDT should strive to develop a working example, showing what a balanced harvesting strategy would look like. It should rely on a scientific basis for an indicator of the health of the trophic web, yet be sensible and operational.

Dr. McKenzie asked about how we would start with some stocks that are already deemed to be overfished or subject to overfishing. He feared that the need to address depletion and overfishing on a single species basis to rebuild stocks could be a back door to still require single species management. Mr. Alexander pointed out that everything is seasonal on Georges Bank, so the stock boundaries are an important issue. Additionally, a species like witch flounder that has accountability measures attached has a big impact on the profitability of fishing trips, yet there are survey availability issues.

Mr. Pappalardo said that it would be productive for the PDT to develop a worked example, with the committee discussing what could be appropriate goals and objectives for rebuilding.

#### Public comment

Mrs. Fuller commended that the FEP being developed was more visionary than any others so far. She was not in favor of focusing the FEP only on the groundfish complex. She thought that under a broad FEP, a change would be needed compared to the current plans to incorporate unmanaged species as ecosystem components in the plan. She spoke in favor of moving the entire FEP out in an intact form for public discussion.

#### ***AGENDA ITEM 1C– PDT PROGRESS REPORT AND OVERVIEW: FORAGE FISH MANAGEMENT***

##### Presentation

Mr. Applegate reported that the PDT, primarily Dr. Gaichas and others, had begun drafting a forage fish paper, adapted from the one developed for the MAFMC but tailored toward New England region species, including the Gulf of Maine and Southern New England. He said that the PDT had raised questions that the Council should consider, because using it within a place-based FEP raises new potential issues. For example, the definition of forage might be different, rather than being focused solely on small schooling pelagic fish. Juvenile and larval fish as well as invertebrates are important components of fish diets and might be included in a broader ecosystem context. He also said that the goals and objectives of forage fish management needed to be developed. As a separate management consideration, a control rule for setting forage fish catch limits could have fundamentally different characteristics than single species management based on MSY. On the other hand, within an FEP the catch limits for functional groups could be defined on a system-wide MSY basis and the catch limits for forage fish would be determined on an integrated basis for all functional groups to optimize the tradeoffs amongst the FEP objectives.

Mr. Applegate reported that Table 3 lists the factors used by the MAFMC to define forage fish, but it could be changed to redefine what is forage for a FEP. Table 4 listed species that would be considered forage fish in the New England region by applying the factors in Table 3. There was considerable overlap, but important difference with, forage species in the Mid-Atlantic. This overlap pointed out the importance of the various management entities having similar or at least compatible goals for managing forage fish.

## Discussion

Mrs. Tooley said that she participated in the development of MAFMC white paper and thought that the difference in the title “Forage Based Considerations” was important. She suggested that there be an objective to determine whether there is enough fish to feed everything. She thought the PDT raised important questions and that it should focus on what would be a scientific basis for determination of whether there is a sufficient forage base.

Mr. Kaelin agreed and recommended that how much forage is needed in the ecosystem should be established and estimated, the needs of the ecosystem should be defined. He pointed out that unlike the MAFMC, the New England draft used a different threshold for defining forage fish, using 5% of the fish diet over a five-year period, whereas the MAFMC FMAT had used a very low threshold (0.1%) which therefore included a very large number of species. He said that the criteria including exhibiting a high variation in recruitment points out that the environment is an important driver in the abundance of forage species.

Dr. Sissenwine commented that Table 3 should be defined in terms of how the ecosystem functions, not just herring but everything else, supply food to not only fish but to seabirds and marine mammals. He added that being predator or prey is a two-way street, that the abundance of predators will affect the prey abundance, and vice versa. Although the abundance of prey affects the predators, and vice versa, the effect is not symmetrical. The abundance of predators will affect the recruitment of prey in a more direct way than the abundance of prey affecting the productivity of predators. He recommended that the criteria for determining what is forage should be developed based on the perceived trophic dynamics of the ecosystem. This should be captured by the ecosystem models, not determined via some a priori criteria.

Dr. McKenzie commented on the starting point, suggesting that the current status of fish and rebuilding is driving the concern about an adequate forage base. He asked if analyzing what was adequate would depend on the current structure of the ecosystem. He also noted that the PDT raised questions about the importance of different life stages of fish, acting as a source of forage.

Mr. Pappalardo thought that the plan should recognize the different values for different species of forage. He noted that sand lance are very important, but the status of many forage species is unassessed or unknown. Mrs. Tooley pointed out that including invertebrates as a forage species could be important. She gave an example that the high abundance of lobster in recent years is thought to be a product of low abundances of predators, such as cod. She thought that the status of the resources and the trophic dynamics should not be ignored in determining what is the forage base and whether it is adequate.

## Public comment

Mrs. Fuller supported expanding the example list to include invertebrates and key species like copepods. She thought that in addition to fish and marine mammals, turtles and seabirds should be added to the list of predators. She added that the fish diet data was not very good and the 5% threshold is way too high. She recommended removing the criteria that forage is defined on the basis of schooling behavior.

***AGENDA ITEM 1D– PDT PROGRESS REPORT AND OVERVIEW: HABITAT CONSERVATION AND SPATIAL MANAGEMENT***

Presentation

Mr. Applegate reported that the PDT had been wrestling with how habitat conservation would be considered in an FEP, whether it would be fundamentally different than how it is currently focused. The PDT discussion focused on whether the basis would focus more on the role of habitat to promote productivity and diversity, thereby reducing ecosystem risk. In addition to conserving vulnerable habitat, i.e. hard substrates with low recovery potential that can be damaged by bottom-tending fishing gears, it might be more broadly focused on conserving EFH, whether the habitat is a biological or physical environment, or used seasonally for an important function, like spawning or nursery area. He said that more work would be needed to develop a coherent draft spatial conservation management approach as it relates to an FEP. He recommended that developing and articulating objectives for spatial management approaches in an FEP would be helpful.

Discussion

Mr. Pappalardo said that it will be important how the spatial management concepts nests or fits into other ocean planning activity, NROC and EBM development. More broadly, spatial management in an FEP could improve the effect that Council policy has on non-fishing uses, allowing a more effective dialogue, with the models estimating an ecosystem value to space.

Mr. Kaelin added that he would be interested in how HPAs and MPAs would fit into spatial ecosystem management. He thought that the utility of MPAs was not clearly defined or articulated, but an FEP with this type of spatial management could address this issue.

Mrs. Tooley thought that this is an important issue, but not a core element that needs to be focused on right now. She thought that it should remain as a FEP component, but it should be a later focus of FEP development work.

***AGENDA ITEM 1E– PDT PROGRESS REPORT AND OVERVIEW: MANAGEMENT STRATEGY EVALUATION (MSE)***

Presentation

Mr. Applegate reported that the PDT only recently began focusing on MSE as being part of the next phase, where fishermen and other stakeholders participate in a process that evaluates and ranks tradeoffs among goals. He thought that this phase could also be used to fulfill NEPA scoping requirements. He added that it was unclear about what an operating model would look like, but that some PDT members felt that an initial step would be to have the stakeholders work on developing goals and objectives, then develop the models to analyze those goals and objectives.



## Discussion

Mrs. Tooley said that Dr. Gaichas opinion was that the type of model is not used as an input to the MSE, but is an output from the discussion of goals and objectives.

Dr. Sissenwine drew a distinction between an operational model and an operating model. He thought that the operational model would be an outcome of the MSE, but that it was important to start with an operating model, providing a scientifically-based description of how the system works (i.e. what is plausible). The scope of the model should be complete enough to test management strategies relative to any objectives. He thought that the initial focus should be on developing an operating model that is reasonable complete including a plausible range of parameters and interactions, including switching behavior.

Dr. Sissenwine gave the Atlantis model as an example of an operating model, a relatively complex and complete description of the ecosystem. It could be used to test simpler models against it. He said the NEFSC have a lot of models available, including ones that include economic and social dimensions.

Mr. Kaelin and Dr. Bell talked about another length-based model, Hydra, that could be used as an operating model. The question is what is doable and in what time frame. At the current time, the model includes no objective function to estimate parameters – the parameters are only inputs into the model. Dr. Bell thought that what you do is pick the suite of models that are best suited to the set of goals and objectives.

Mr. Curtis thought the matter was going to the shelf to pick models. He thought that the ecosystem production model is closer to being done, which would define a system-wide catch cap. The trick will be to estimate what is available at the functional group level under the catch cap.

Mr. Applegate said that the FEP needed a better written description of what an operating model would look like in the context of FEP evaluation and testing through MSE. He thought a grounded structure of a place based management framework with decisions to be informed by trophic dynamics is an important step.

Dr. McKenzie recommended going forward at a coarse level or approach. He thought that the spatial definitions of scope would be an important component. He recommended focusing on describing what the larger pieces would look like. Mr. Kaelin liked the framework implied in Figure 1, grouping various marine species into functional groups, as a means to focus effort. He emphasize the importance of Document 3, one building block at a time.

Mrs. Tooley thought that the focus needs should not be on all species in an ecosystem, but focus on managed species under the Council's jurisdiction. An operating model should consider the trophic levels, but further consider the things we can manage.

Mr. Pappalardo said he would be interested in how the current ACLs stand up against those functional groups that could be used in ecosystem management. How do optimal trophic

strategies stack up against single-species ACL management. Mrs. Tooley asked if the focus was on restoring a previous ecosystem state, are we trying to change the current state or not. Dr. Sissenwine added that the focus of the operating model would be on how the energetic basis for system wide MSY compared to that for individual species. The committee thought it would be helpful to see an analysis of historical trends in biomass by trophic level or functional group. Several people said that this had been done before, but it could be updated.

Focusing on the future of PDT work, the committee thought that while the coarse scale of FEP components was helpful, they needed more detail on a smaller number of aspects, focusing on the functional groups and providing a working example. Mrs. Tooley thought that further work on forage fish management

Dr. Sissenwine thought that committee was not yet focused enough on advice or direction to the PDT. He thought that focusing on a clear understanding of an operating model is needed, starting with a relatively simple operating model that identifies species (some modeled on their species dynamics and some externally specified) to assess the trophic connections to test different management strategies. This would focus on strategies ranging from MSY based single species management to limits and reference points for trophic guilds. In the latter case, the document should identify what defines overfished and overfishing status, being scientifically defensible measure and describing a process to identify special measure to protect high value species (so that the fishery does not focus only on a few species, driving the most valuable ones to low abundance).

The committee developed the following guidance and advice about further FEP development via consensus:

1. Describe a trophic web area based operating model that specifies:
  - an ecosystem area
  - species present in the area that will be dynamically model
  - species present in the area that will be treated as externalities (they participate in the food web, but their numbers and biomass is determined outside the model- e.g., mammals, birds, most benthic invertebrates)
  - feeding models that account for preference, suitability and availability
  - matrix of production attributable to ecosystem area (incorporating seasonality)
  - stochastic nature of these relationships- could use Bayesian approach
2. Test alternative approaches to management including
  - current single species approach
  - guild (trophic level) approach
  - Total ecosystem productivity approach
3. For each approach, specify:
  - criteria for overfishing

- rebuilding strategy
- mechanism to protect most targeted or vulnerable stocks (min, biomass, but not necessarily linked to  $B_{MSY}$ )

## *AGENDA ITEM 2– FEP GOALS AND OBJECTIVES*

### Presentation

Mr. Applegate reported that the PDT had developed a framework for goals and objectives that had been presented at the last committee meeting, but the PDT was looking for more discussion and feedback on them.

### Discussion

The committee thought that some of the descriptions in the document were too proscriptive. Some committee members questioned whether the intent was to restore ecosystem balance to some previous or another state, but wanted to promote ecological integrity and conservation. Thus the committee modified strategic goal 6 to include this and change the wording in the strategic objectives to ‘manage and support’ rather than ‘maintain/restore’.

The committee struggled with strategic goal 4, ‘optimize intrinsic (existence) values and wanted to strike it from the list. Others thought that it was important to retain it because it address all of the non-catch/economic benefits that people have, not just deriving revenue from the resource. Thus, the committee retained this goal, but modified it to be more reflective of what can be realistically achieved. The committee added ‘recognizing inherent dynamic properties and limits of the system’ to reflect this sentiment.

The committee struck operational objective 2 because it relates to management of species that the Council does not have authority to manage, although the committee recognized that many rules that govern fishing activities which have interactions with whales and marine mammals are done through our plans, through Section 7 consultation. They thought that this does not need to be a central component of an FEP.

Committee members thought that operational objective 4 was too detailed and that some of the aspects of it were more appropriately described as ecosystem indicators, rather than be a focus under objectives. The committee therefore struck sub-categories a to c, under operational objective 4, but recognized that they would be used in describing how an FEP would be assessed and monitored.

The committee combined operational objectives 5 and 6, both being similar and focused on habitat conservation, but they wanted to retain the focus on actions benefiting managed fish species. The committee also recognized the importance of minimizing effects of permanent impacts on the ecosystem, but the details in the operational objective were being addressed in the OHA2 and coral habitat amendment. The subcategories a to d were too detailed, overlapped existing management actions, and were struck from the list. The committee added minimize ‘to the extent practicable’ to recognize the importance of doing what is economically possible.

### ***AGENDA ITEM 3– ADVISORY PANEL (AP) AND SCOPING***

#### **Presentation**

Mr. Applegate reported that the committee had discussed the formulation of an FEP AP and timing at the last meeting, but it was important to reconsider this as the example FEP and the process is defined. At the last meeting, the committee had questions about the focus, role, and function of such an AP. He reminded that while a need for an AP is yet a ways off, it would be good to start it a few months ahead of when it is needed, because the process of gathering and vetting nominations takes time.

#### **Discussion**

The committee thought that it would be important for the AP to be broad-based geographically and include representation from the Mid-Atlantic region, with a cross section of representatives but heavy involvement of fishermen. Some thought it would be important to have the AP provide pre-scoping input into the goals and objectives of an FEP, but others thought that a good time to develop an AP would be after scoping. Mr. Curtis thought it would be important to work out the timing and expectations of what the AP would do. Dr. Sissenwine thought that sometimes the AP input isn't helpful if done too early, before there is a lack of focus. He didn't think an AP will focus the issues and it may be beneficial to hold off on naming one. Mr. Kaelin thought a good time to form an AP would be after taking a document to public scoping. Mr. Pappalardo suggested it would be helpful for the committee to focus on and describe the skill sets that the Council needs on an AP.

The EBFM Committee meeting began at 9:15 am adjourned at approximately 5:00 p.m.