

FEP Development

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Conventional management	EBFM
Narrow focus goals and objectives	Broad based goals and objectives
Single stock management	Place-based management
Explicit tradeoffs rarely considered <ul style="list-style-type: none"> • Economic and social effects analysis focused within a managed fishery 	Explicit prioritization of tradeoffs amongst different fisheries and beneficiaries <ul style="list-style-type: none"> • Economic, social, and ecological effects over interacting fisheries
Mitigate impacts on productivity of stocks managed by FMP	Mitigate impacts on all harvested stocks & other elements of the natural environment
Trophic interactions not usually considered in control rules and specifications	Explicit consideration of trophic interactions and ecosystem risk
Stakeholder involvement and transparent decision-making	Stakeholder involvement and transparent decision-making

Conventional management	EBFM
Single species stock assessment without interactions	Operating models to test strategies and evaluate tradeoffs Stock assessment to determine specifications
Single species control rules	Ecosystem and stock complex control rules
Overfished status and rebuilding focuses solely on a single stock	Overfished threshold and rebuilding targets consider ecosystem risk and benefits
Less flexibility and robustness to change	Potential for more flexibility and robustness
Measure and adjust	Measure and adjust

NEFMC Process

Don't design solution without understanding the problem

- Phase I – decide on application
- Phase II – develop example Fishery Ecosystem Plan (eFEP)
- Phase III – testing, verification, engage public (scoping)
- Phase IV – develop alternatives for final FEP
- Phase V – implement and make adjustments



Phase I

- **Decide on approach**

April 2015: <http://s3.amazonaws.com/nefmc.org/2.-EBFM-procedure-discussion.pdf>

- Ecosystem Approach (EAFM) policy documents
 - Example Fishery Ecosystem Plan (eFEP)
 - Implemented Fishery Ecosystem Plan (iFEP)
 - Blended Fishery Ecosystem Plan (bFEP or Omnibus Amendment)
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- **EBFM/EAFM initiatives for other Councils and Countries**
 - Summary: <http://www.nefmc.org/calendar/may-22-2014-ecosystems-based-fisheries-management-meeting>



NEFMC Approach

- To 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.

NEFMC Process

- To prepare:
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.



Phase III

July 2017 to June 2017

- eFEP Management Strategy Evaluation
 - Operating model defined by Phase II
 - Participation by fishermen and interested parties
 - Identify goal, objectives, performance metrics
 - Evaluate tradeoffs and optimize outcomes
 - Verification of model
 - Testing



Phase IV

- Fishery Ecosystem Plan Development
- Phase III scoping
- Develop management alternatives and choose preferred
- Draft FEP and analyze impacts
- Public Hearings
- Chose final alternatives



Phase V

- Operate Fishery Ecosystem Plan (i.e. regulations pertaining to EPU)
- Amend plan as needed
- Develop trophic models and FEPs for other EPUs (e.g. Gulf of Maine, Southern New England/Mid-Atlantic)



Lenfest Blueprint

“The process will undoubtedly be conducted in different ways by different RFMCs”

- Actionable outcome
 - Management decisions affected by ecological considerations
 - Cross plan and cross jurisdictional application
- Multispecies
- Maintains FMP overlay approach – EBFM applied to individual plans
- Encourages MSE

Lenfest Blueprint

“The Task Force recognizes that regional experimentation with FEP development presents an opportunity for learning and for sharing lessons”

- Actionable FEP with specific goals and objectives as well as management strategies
- Encourages MSE (structured planning process)
 - Goals and Objectives; prioritization
 - Compatible performance metrics
 - Simulation modelling to evaluate strategies

Lenfest Blueprint – FEP Steps

- Ecosystem status and trends
 - Conceptual model
 - Measure and assess ecosystem indicators
 - Inventory threats

Lenfest Blueprint – FEP Steps

- Managers and stakeholders develop aspirational and actionable vision
 - Vision statement
 - Strategic objectives
 - Identify and Analyze risks (e.g. climate change, coastal development, ocean activities)
 - Prioritize objectives
 - Develop operational objectives (desirable ecosystem states)
 - Specific, measurable, achievable, realistic, and time-bound

Example Vision Statement

“Promote sustainable fisheries that provide benefits for harvesters, processors, recreational and subsistence users, and fishing communities, which (1) are maintained by healthy, productive, biodiverse, resilient marine ecosystems that support a range of services; (2) support robust populations of marine species at all trophic levels, including marine mammals and seabirds, and (3) are managed using a precautionary, transparent, and inclusive process that allows for analyses of tradeoffs, accounts for changing conditions, and mitigates threats.”

Lenfest Blueprint – FEP Steps

- Operationalize the plan
 - Develop performance measures/indicators
 - MSY (biological yield) or MEY (net revenue), annual catch (or revenue) variation, frequency of depletion, effects on recruitment, frequency of fishery closure, effects on large predator populations
 - Develop candidate adaptive management strategies
 - Incorporate knowledge and build trust

Lenfest Blueprint – FEP Steps

- Operationalize the plan
 - Evaluate performance of strategies
 - Expert opinion or mathematical simulation
 - Structured workshops
 - Qualitative modelling
 - Simulation
 - Apply variety of perturbations
 - Screen out poor performance
 - Ranking
 - Evaluate tradeoffs

Lenfest Blueprint – FEP Steps

- Select best strategies
 - Maximize value
 - Minimize risk
 - Diversity of benefits
- Implement plan
 - Identify Action to be taken
 - Triggered actions
 - Management resources needed for administration and monitoring performance metrics
 - Measure response
 - Timeline for adjustment

Lenfest Blueprint – FEP Steps

- Performance assessment & adaptive management
 - Ecosystem status
 - Did it change?
 - Is it meeting original goals?
 - Are the original goals still appropriate?
 - Unanticipated effects

Lenfest	NEFMC/NEPA process
Ecosystem status and trends (Step 1)	Ecosystem status report (Affected environment)
	Phase I – choose policy instrument and management structure to develop EBFM
Early EBFM tool development (page 37)	Phase II – develop example FEP and operating models, for demonstration and communication in Phase III <ul style="list-style-type: none"> • Ecosystem catch cap • Catch limits for functional groups or stock complexes

Lenfest	NEFMC/NEPA process
Develop aspirational vision and objectives (Step 2)	Phase III (scoping) – Choose EBFM goals and objectives; evaluate management strategies; heavy public participation
Operationalize the plan <ul style="list-style-type: none"> • Performance metrics • Identify and evaluate management strategies (Step 3)	

Lenfest	NEFMC/NEPA process
Select best strategies and implement the plan (Step 4)	Phase IV – Develop final FEP with EIS, submit for review,
Performance assessment and adaptive management (Step 5)	Phase V – Monitor and amend FEP

Lenfest Blueprint – Tools

- Tendency to hold EBFM science tools to the same technical standards as those for conventional fisheries management (sic).
 - “These technical standards are unrealistic and inappropriate”
 - “EBFM tool development is best done iteratively” to identify critical unknowns and subsequent models become increasingly robust and relevant.
- Tools should be developed early; well understood behaviors and properties; vetted (page 37)