MAFMC Ecosystem Approach to Fishery Management Update

MAFMC Executive Committee
June 13, 2013
Ecosystem Guidance Document Development

- Council formed EAFM working group to develop guidance document and background information necessary to inform the process
- Current member expertise in areas of ecosystem level assessment modelling, habitat, social/economics and fishery management
EAFM Working Group

- Sarah Gaichas (NMFS NEFSC)
- Jon Hare (NMFS NEFSC)
- Geret Depiper (NMFS NEFSC)
- Karen Abrams (NMFS HQ/SF)
- Terra Lederhouse (NMFS HQ/Habitat)
EAFM Guidance Document Focus

1. Forage/low trophic level species considerations
2. Species interactions (predation, competition) and their effects on sustainable harvest policy
3. Incorporation of social and economic considerations in OY specifications/EAFM
4. Effects of systematic changes in oceanographic conditions on abundance and distribution of fish stocks; ramifications for existing management approaches/programs

5. Incorporation of habitat conservation and management objectives in the current management process (including water quality issues)
Ecosystem Workshops Purpose

- Bring together technical experts, managers and stakeholders to evaluate science and policy aspects of each issue
- Develop recommendations for best practices to be incorporated into Council’s EAFM operational guide
- Does the Council wish to pursue additional workshops?
Forage Panel Discussion
April 11, 2013

- Focus on science related to assessment and management of forage species
- Discuss where in the process these issues should be handled including stock assessments, ABC control rules, OY specification
- Discussion will inform EAFM Guidance Document development
Forage Workshop Summary

- Forage species (FS) definition possible based on LTL, life history and vulnerability to F (start with draft MAFMC definition)

- Council should consider managing FS more conservatively relative to traditional MSY reference points (maintain $B > B_{msy}$ and $F << F_{msy}$).
## Candidate MA Forage Species

<table>
<thead>
<tr>
<th>Species</th>
<th>Fished</th>
<th>Retained Bycatch</th>
<th>Discarded Bycatch</th>
</tr>
</thead>
<tbody>
<tr>
<td>Butterfish</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Atl. mackerel</td>
<td>yes</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>Longfin squid</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Illex squid</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Atl. herring</td>
<td>yes</td>
<td>?</td>
<td>yes</td>
</tr>
<tr>
<td>Atl. Menhaden</td>
<td>yes</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>River herrings</td>
<td>no</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>Sand lance</td>
<td>no</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>Round herring</td>
<td>no</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>Sardines</td>
<td>no</td>
<td>no</td>
<td>?</td>
</tr>
<tr>
<td>Anchovies</td>
<td>no</td>
<td>no</td>
<td>?</td>
</tr>
</tbody>
</table>
Can the MAFMC Develop a Forage Policy?
ABC control rule/Council risk policy

- Option, link $P^*$ to treatment of $M$ in assessment
- ABC based on $P^* = P^* - f(M \text{ gradient})$
- Potentially plausible for Level 1, 2, 3* assessments
  * when SSC elects to define OFL distribution
Accounting versus managing

- Enhanced treatment of M within assessments serves to describe historical predation demand
- ‘Better’ M modeling = better accounting
- Ecosystem structure and functioning goes well beyond better accounting
  - EAFM necessitates making choices/tradeoffs

\[ \Sigma MSY_{SS} > MSY_{System} \]
Current state of ecosystem models and data

Able to support an ecosystem approach to management, and specifically forage management policy
An intermediate-complexity tactical ecosystem assessment tool combines:

**Standard stock assessment**
- Structured population dynamics
- Statistical parameter estimation using multiple data sources
- Biological reference points and stock status for management

**Ecosystem considerations**
- Species interactions and tradeoffs
- Environmental effects on key population processes
- Populations and fisheries in space

...WITHOUT requiring time machines, expensive new surveys, or supercomputers
Information needs for forage species

And two main questions to address
Two main questions

How to include predation in forage fish management?
- Within single species assessments
- Using multispecies assessments
- As an adjustment to policy (OFL, buffers, etc.)

How to account for tradeoffs in predator consumption requirements when managing forage fish?
- Possible with current data, multispecies models
- Managing tradeoffs a new level of policy
EAFM WG Forage Fish Tasks

- Finalize forage definition
- Fully develop list of forage species in MA – describe past and present abundance
- Develop options for ABC control rule protocol and risk policy modifications incorporating M2
The proposed framework for forage species could work as follows:

1. OFL determined based on MSA defined $F_{msy}$ (or OFL Proxy)
2. SSC specifies ABC based on current risk policy with respect to "atypical" species ($p^*=0.35$) if M2 not included in stock assessment, else $P^*=0.4$.
3. Based on ecological/social/economic evaluation, Council could add additional ecosystem consideration buffer when specifying OY (aka "ecological set-aside") for forage stocks. The bounds for the ABC/OFL ratio under proposed OY framework for forage stocks become:

\[0.25-0.5] > \frac{ABC}{OFL} > 0.81 \text{ if M2 is adequately incorporated into stock assessment, else} \]
\[0.25-0.5] > \frac{ABC}{OFL} > 0.73 \text{ (i.e., M2 not adequately addressed). The Council could add additional buffers during specification of OY, but lower bound would be 0.5.}\]
EAFM WG Forage Fish: Other Tasks

- Explore definition of functional groups and assess current state of forage base in Mid-Atlantic ecosystems
- Develop analytical framework to assess food web dynamics
- Develop transition strategy for incorporation of ecosystem considerations into current process
EAFM WG:
Other tasks

- Begin to plan next workshop dealing with ecosystem changes in light of climate variability/systematic change to be held in December 2013 (see revised EAFM Document Timeline)
PFMC Ecosystem FEP Update

- FEP adopted in April 2013
- Council proposes to implement FEP through systematic development of ten “ecosystem initiatives” (analogous to our guidance document – i.e., *tactical* )
- First initiative is currently an “action” to tightly control development of any new fisheries for forage stocks in Pacific Ocean under its jurisdiction
Prohibit new fisheries for forage stocks

- PFMC reviewed current federal list of authorized gears/fisheries
- New fisheries to be developed under experimental fishery permits with accompanying scientific analysis of impacts of new fisheries
PFMC Ecosystem Potential Initiative A.2.1

1. Evaluation of long-term effects of Council harvest control rules on age/size composition of managed stocks (considering incorporating size/age structure into BRPs)
PFMC Ecosystem Initiative A.2.2

- Identify finer scale bio-geographic regions within large marine ecosystems
- Required to address water quality, habitat issues, etc. especially in estuarine and inshore areas
PFMC Ecosystem Initiative
A.2.3

- Cross FMP bycatch and catch monitoring to develop cross FMP bycatch minimization goals
- Currently addressed in comprehensive SBRM Amendment (will be incorporated in EAFM Guidance Doc)
PFMC Ecosystem Initiative A.2.4

- Cross FMP EFH initiative which would be an ecosystem based evaluation of EFH designations across all PFMC FMPs (5-y review)
- Identify habitat areas of importance common to multiple FMPs/fisheries
PFMC Ecosystem Initiative A.2.5

- Cross FMP safety evaluation as per NS 10
- Provide for directed engagement between Council, USCG, Fed. Enforcement., Nat. Wx Service to identify safety concerns within Council managed fisheries as a result of sum total of all federal fishery regulations
PFMC Ecosystem Initiative A.2.6

- Human recruitment to fisheries
- Address concerns about “greying” of fleet and fishery participants
- Allow/plan for training and entry of new and younger fishermen into fisheries
PFMC Ecosystem Initiative A.2.7

Cross FMP determination of socio-economic effect of fisheries management
PFMC Ecosystem Initiative A.2.8

- Cross FMP evaluation of effect of climate change/shifts (ocean warming and acidification)
PFMC Ecosystem Initiative A.2.9

- Cross FMP evaluation of cumulative effects of fishery management actions on ecosystems to inform NEPA analyses across FMPs