New England Fishery Management Council
EAFM Stakeholder Workshop # 5
Gloucester, MA

Date:	October 12, 2005
Location:	Massachusetts Division of Marine Fisheries Annisquam Station
Attendees:	(15) – Sal Testeverde, Georgetown MA David Bergeron, Gloucester MA; Doug Christel, Salem MA; Earl Meredith, Gloucester MA; Brad McHale, Gloucester MA; Donald Nelson, Andover MA; Jay Michaud, Marblehead MA; Susan Michaud, Marblehead MA; Mike Armstrong, Gloucester MA; Dave Marciano, Gloucester MA; Paul Vitale, Gloucester MA; Ben Cowie-Haskell, Scituate MA; Carmine Gorga, Gloucester MA; Frank Gable, Natick MA; Ray Bates, Marblehead MA
Facilitators:	Chad Demarest (NEFMC), Kathy Mills (Cornell University)
Start time:	5:30 scheduled, 5:50 actual
End time:	8:30 scheduled, 9:10 actual
Questionnaires:	11 completed on-site, 0 received in mail

I. Purpose and format

The purpose of this workshop was to engage participants in a discussion, and to solicit a wide range of opinions, on topics critical to integrating ecosystem approaches into the Council's stewardship of marine resources and our fisheries.

After introductions, the workshop was divided into two groups: Group A began with 8 people, and Group B with 7. Kathy led Group A through Objectives, Indicators and Tools first, while Chad led Group B through Ecosystem Boundaries and Collaborative Management. After approximately 1 hour and 45 minutes, the groups were rotated.

II. Break-out Session: Objectives, Indicators and Tools

Implementing an ecosystem-based approach to fisheries management requires drawing upon stakeholder input to define objectives for both local fisheries and ecosystems. Identifying indicators to track the status of these fisheries and ecosystems, and determining methods or tools for reaching these objectives, follow closely after. Participants were asked to consider changes in fisheries management that may result if ecosystem approaches are utilized, and to identify objectives related to the fishery management process and its outcomes for both fisheries and the ecosystem. From this information, we hoped to gain a sense of the issues and priorities stakeholders want to see addressed through an ecosystem approach, and the results they hope such an approach will achieve. Participants were also asked to identify indicators (including biological, ecological, social, and economic features) that can be used to track how well fisheries and the ecosystem are doing based on metrics relevant to our stakeholders. Finally, participants shared their perceptions of

the usefulness and acceptability of common current management tools and offered suggestions for other tools that could be adapted under an ecosystem approach.

A. Objectives

Objectives stated by participants in this session fell into four major categories: management and the management process, stakeholders, ecological considerations, and science. [Note that these categories were developed after the discussion and were not used to guide the session.] Much of the discussion centered on science needs and objectives concerning what research should be done to support EAFM and how this research should be accomplished. There was concern that an EAFM requires understanding the full ecosystem, a very complex and complicated prospect. There was also much support from fishermen, NGO representatives, and fishery managers for integrating fishermen more thoroughly in the science process to promote a greater common understanding between them and scientists. Achieving this goal may require new institutional and organizational capacities.

Management structure and process

- Managers, scientists, and fishermen need
- Manage for forage species as well as predators
- Need flexibility in access and management to switch pre-ssure from more abundant species
- Magnuson-Stevens dictates how resources are allocated in management agency
    - Sets up tension between different parts of agency addressing different needs
- Use constant ecological relationships to set objectives and targets
- Consider effects of/relationships to other activities and sectors
- Use fisheries management to fine-tune trophic dynamics of system

Stakeholders

- Stakeholders all need to have a stake and see the big picture

Ecological considerations

- Look past managing to the weakest link, so guild approach may be useful
    - OY from group of species
- But can't ignore weakest link either (can't continue devastating cod)
- Look at direction of total biomass
- Recognize that can't have everything at maximum levels at the same time due to environmental regulation, competition, and other factors
- Gear appropriate to habitat in which it is being used
- Scale of impacts scaled to habitat
- Species composition should look like pre-1963
    - Balance of species
    - Pelagics were balanced when they were heavily fished

Science

- Better defined/developed institutional/organizational structure to integrate fishermen in research and management process
    - Fishermen involved in all aspects:
        - Defining questions that are asked in research
        - Recording observations of what they see
        - Guiding research design and process
        - Collecting information
        - Analyzing data and reporting findings
    - Such an approach bridges gaps between fishermen, research, management
    - Approach creates a new understanding of big picture
- Fishermen and scientists each need to walk in other's shoes
- Bridge mis-understandings between fishermen and scientists
- Use science as a guide, but recognize its imprecision
    - Generally, things are moving in the right direction
    - Focus on general trend, not always the specific details
- **Need to identify factors driving future trade-offs
    - Interactions between species
    - Need to understand function to evaluate trade-offs
    - Need to identify potential trade-offs that may need to be considered
- Need to consider life history factors and changes in assessments
- Need to consider and account for predation in assessments
- Need to know/define who is predator and who is prey (recognize that these roles vary in time and space)
    - Harvester is a predator
- Recognize dynamic system and don't try to oversimplify…but it can be simplified
- Understand mechanisms
- Recognize that system changes and take these changes into account in models
    - Years with low abundance of common prey
- Better understand trophic dynamics and how those change and affect biomass of specific stocks
- System and trying to understand it is too complicated at this time
- We haven't simplified system enough
    - Use guilds
    - Understand inter-relationships
- But if simplify too much it becomes useless (models tend to oversimplify)
- Fishermen have a wealth of data that is currently ignored
    - Scientists need to use this information (e.g., movement/boundaries of species)
- Fishermen should have a role in science as providers of information
- Science should understand the role of natural environmental change

- Need to understand the role of social factors affecting fisheries and ecosystem
- Look at whole food web and physical oceanography
- Identify what "holds" certain fish in certain areas
- Need to resolve disconnect between fishermen and scientists
    - Fishermen need to see what certain outcomes mean to them
- Stock patterns scientists see are skewed by accuracy of VTR data
    - Need to explore value of VMS to science and use it more

B. Indicators

Indicators put forward by the group included ecological and socio-economic features that could be used to track the status of fisheries and the ecosystem. (Note: categories for the indicators were developed after the group discussion.) Participants emphasized the need to monitor forage species and to better track changes in natural mortality. In addition to some of the more common fleet and fishery indicators, participants in Gloucester expressed the need to consider secondary, spillover benefits of fisheries and to track the integration of fishermen in research and management processes.

Ecological

- Overall abundance/biomass of related species
- Trophic balance
- Size and age structure of populations
- Forage species biomass
- Total mortality
- Total biomass
- Spatial distribution of populations
- Expansion of populations into areas they currently aren't found in but previously lived in

Socio-economic

- Number of fishermen
- Fishing communities
- Fleet structure
    - Age
    - Maintenance (need to adjust for actual fishing vs. tax write-offs)
    - Crew, jobs available
- Secondary economic benefits
- Social and cultural factors
    - Emotional perspectives
- Community networks
    - Outward effects from Gloucester
- Social integration of fishermen in science and research
    - Amount of money spent on joint research
    - Number of projects
    - Number of fishermen and scientists working together

    - Diversity of fishermen, scientists, institutions involved
- Diverse fleet
    - Gear sectors
    - Vessel sizes
    - Ports
- Shoreside infrastructure
    - Processors
- Number of fishermen participating in management
- Age of fishermen

C. Tools

Participants expressed a general dislike of some of the effects created by many currently-utilized management tools. They suggested that collaborative trainings involving both fishermen and fisheries enforcers be developed so that enforcers are more knowledge of the fish they are seeing and fishermen are more aware of what the enforcers want to know. Participants urged that good transparent science be used as the basis of developing tools. They wanted to see effects of gear and catch changes incorporated into scientific models. Participants liked new technologies, such as VMS, and suggested that these technologies be used more widely to develop and enforce management tools.

Management tools	Useful for?	Acceptability?
Effort controls (DAS, trip limits, trap limits)		Dislike discards
Output controls (quotas, size limits)	Slot limits useful for protecting large females (dogfish)	Want to avoid throwing away good fish Want to prevent takes of any lobsters anywhere with V-notches
Technical tools (gear/vessel regulations)		
Protected areas (spawning/year-round closures)		Permanent closures have led to foregone fishing Need to be able to change boundaries to protect species of concern Need to be flexible to protect fish when they are actually spawning

III. Break-out Session: Ecosystem Boundaries and Collaborative Management

One of the foundational concepts underlying Ecosystem Approaches to Management is that different geographically-defined areas have different biological production capacities, and that it may be advantageous to scale science and management to these areas. The first step, obviously, is to define the areas. The group was asked the question "what makes a particular area unique." The answers in many cases may be predictable, such as "temperature," "salinity," "sediment," etc., but the question was designed to get the participants thinking in terms of spatially-differentiated geographical areas. It was especially interesting to note when novel indicators were explored, and to what degree participants felt that actions of humans (fishing and non-fishing) should be factored into the equation.

Input was then solicited on the appropriate geographic scale for fisheries management, the link between 'scientifically-defined ecosystems' and potential 'management areas,' and any governance issues that may arise as a result of spatially-defined ecosystems.

Terrestrial and, to some extent, international literature on ecosystems approaches to management frequently target community-based (or co-management, collaborative management) principals as a primary driver for ecosystems approaches to management. The group was asked to comment on the perceived advantages of collaborative management, such as an increased sense of stewardship and the potential to see gains from personal conservation-based behaviors, and how these benefits may dovetail with what might be considered a highly geographically mobile fishing fleet in New England. Does the capacity for local management exist? Is there a way to maintain geographic flexibility while achieving the perceived benefits of community-based management? Are communities necessarily geographic, or can they take on other units?

A. Ecosystem Boundaries

Responses by participants are categorized (below) into one of three themes: delineation, governance, and scale. These themes emerged from discussions during the workshop and they were not presented to participants in this structured format.

There was a serious bias toward ecological indicators for defining local ecosystems, but at least a few participants felt strongly that boundaries would be drawn differently for different species. While this argument somewhat mirrors the Essential Fish Habitat process (that is, defining ecosystems relative to a single species is likely to yield a similar product to a single-species definition of EFH), the idea that objectives for defining boundaries in the first place seems important. The "functional unit" idea was brought up, which may be akin to the "landscape architecture" ideas we've heard about at previous workshops.

The importance of accounting for impacts across ecosystems was stressed, and the relatively novel idea that inter-ecosystem trade-offs may become necessary or integral to a spatially delineated approach also emerged. There was a strong sense, vocalized by several participants, that areas should not be "set in stone" and adaptive management principles should be accommodated from the outset.

Delineation

- Habitat/sediment/substrate
- Currents
- Temperature/salinity
- Depth
- Water quality
- Coastal influences, watersheds
- Human community structure
- Biological communities
- Oceanographic systems (circulation)
- Biological transports
- Larva dispersal
- Forage fish
- "Functional unit" concept
- Recognize high degree of species variability within an area
- Local ecosystems may change based on purpose/objectives
- Boundaries will shift as variables change
- Seasonality an important component
- Fishing communities: fishing practices may impact ecosystems

Governance

- Human uses may determine local ecosystems
- Must be flexible and recognize constant changing of all variables
- Must have long-term view; not a knee-jerk reaction
- Specific areas discussed: Western GOM, Coastal GOM, Mass Bay, Cape Cod Bay, Great South Channel, Georges Bank, Basins in Eastern Gulf of Maine
- Must account for impacts across local ecosystems
- Local ecosystems may be appropriate areas for management
- Must be adaptive and not permanent
- Must be spatially and temporally variable
- Can't get "locked in" to any one mode of defining ecosystem
- Should take our best guess and adjust as necessary
- Must account for impacts between ecosystems and accommodate trade-offs
- Is it possible/desirable to define areas that are geographically smaller than the range of the species they encompass?
- May be able to use small-scale example of SAMS/DAMS for right whales

Scale

- Depends on objectives for either science or management
- Once size doesn't fit all
- May be different for different species

B. Collaborative Management

Perhaps due to an imperfect introduction, discussions of collaborative management for half of the participants (one session) focused on area-based management as a tool. While this was not necessarily the desired outcome, some interesting thoughts emerged. Participants felt that a pilot project should be undertaken, perhaps using the Stellwagon Bank National Marine Sanctuary. Several participants pointed out that if a concrete project was presented, a community of stakeholders would emerge. The idea that communities may be geographically-specified was not readily obvious; in fact, fishery communities (that are not spatially-defined) seemed to be a more palatable idea.

- Area management may be best affected by using species or aggregate quota
- Need a definition of area that people can agree on
- Current areas may be used as examples for community input from both the managers (Council) and fisherman…note who fishes where, and ask "what's a better way to manage this area"
- Use Stellwagon Bank NMS as a pilot area
- Allocation battles are a major concern
- Vessel size restrictions that are specific to areas, such as inshore/offshore zones, are a good idea
- We should not have area-specific vessel size restrictions
- We must prioritize issues, starting with defining ecosystem structure and function
- Focus on the pilot project idea
    - Limited scope
    - Engaging communities/stakeholders with definitive plan
- Ensure all stakeholders are represented, not just fisherman
- Focus on cooperative research; encourage the involvement of fisherman in science
- Communities are not geographic, rather they are more tied to fisheries
- Community/stakeholder input is most critical at the introductory stages of management
- Fisherman, when thought of as predators, don't respond in 'natural' ways to declines in prey…that is, they don't necessarily vary (in number) as ecological realities change
- Management needs to be more in synch with natural cycles, incorporating their 'lag time'
- Ecosystem approaches should emphasize natural laws (vs. legal laws)

IV. Summary statements

Both groups were reassembled in plenary and given an opportunity to provide any comments or feedback on any issues pertinent to ecosystem approaches to fisheries management. Here is what they felt was most important:

- Approach carefully
- Stakeholder-driven process

- Focus on cooperative research
- Change will take time—patience
- Recommend a pilot project for an ecosystem research plan
- Define predator/prey relationships (i.e. food webs)
- Must respect laws of nature
- Should consider fisherman as predator in the ecosystem
- Recognize the role of people and fisherman in the ecosystem
- Must consider the economics and communities in decision making
- Cannot apply management until we're ready
- Recognize that even if we understand how the ecosystem functions, this may not help us manage better due to complexity
    - Understanding a system and effective management of it are different
- Must recognize the importance of wetlands in fisheries productivity
- Must understand anthropogenic impacts
- Common sense should carry weight
- Long-term nature of the ecosystem
- Consider a prohibition on lawsuits—allow time for regulations to work
    - Lawsuits impact relationships between regulators, scientists, fisherman and environmentalists
- Must start with the communication of objectives
- Emphasize the positive health effects of eating fish
- Recognize/incorporate the impacts of global markets and trade
- Use Ecosystem Approaches to eliminate reliance on MSY