

Ecosystem Approach to Management – What Next

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Four Components to an Ecosystem Approach (FAO, IOC, UNEP)

- Take Account of the Effects of:
 1. Environmental Forcers on the dynamic of the stock (property) being exploited
 2. The Fishery (Human Activity) on the whole Ecosystem (“footprint”)
- Manage human activities with:
 3. An integrated approach (“Integrated Management”)
 4. Inclusive and transparent governance

1. Environmental Forcers

PICES very strong here (CCCC)

- Excellent at increasing understanding of:
 - How forcers affect biological properties
 - *Processes* underlying the relationships
- Linking ecosystem responses to management options seems secondary consideration
 - Major opportunity for regime-based Management Strategy Evaluations

2. Footprint of the [Fishery]

- Much less activity than around Atlantic in:
 - Bycatch rates & mortalities of non-target species,
 - Impacts of fishing gears on the seabed
 - Formal Precautionary frameworks for management of impacts
- Comparable or ahead of Atlantic in
 - application of research on community - food web consequences of harvests - pollock & sea lions
 - applied work on genetic consequences of harvesting levels and strategies – salmon

Footprint of the [Fishery]

- Substantial opportunity to build on strengths
 - How exploitation affects trophodynamic linkages at community scale,
 - How exploitation affects **Resilience** and Productivity of the system
- Need to describe and parameterize functional relationships between ecosystem consequences and level of human activities
 - the “F-effort” link for ecosystem properties
- Need systematic development of strategies for finding & evaluating management options relative to ecosystem consequences

3. Integrated Management

- When every human activity in the sea is managed as an independent pressure, assessments ignore cumulative effects, and multiplicative interactions.
- INTEGRATED management is largely unexplored territory beyond coastal applications
 - Coastal work provides good foundation
- Severe challenges to IM posed by unreceptive / complex governance systems

Integrated Management

- Key work to start filling vacuum:
 - Strategic Environmental Assessments of classes of activities to DOCUMENT consequences of individual activities
 - Documenting individual effects is a precondition to aggregating CUMULATIVE effects
 - Management Strategy Evaluations to DOCUMENT rationales for choices in sectoral management
 - Documenting rationales is a precondition for harmonizing decision-making across sectors

4. Inclusive Governance

- *Terra Incognita*; domain of social sciences
- Need many & good linkages, have few
- None of the science knowledge translates into good policy & management without *implementation*
- No effective implementation without good understanding of social, cultural, & economic systems and constraints
 - Good social sciences and modest ecological knowledge can be basis for VERY effective mgmt
 - Poor incentives & social dynamics will cause management failure however good the ecology!

4 components are very different; ALL essential, ALL our business!

- Capacities and appetites for progress uneven
- Should not wait for slowest component to move forward;
BUT
- If ANY component is weak, will NOT succeed at:
 - Conservation of biodiversity & protection of vulnerable marine ecosystems
 - Sustainable use of marine resources
- Lack of work on formal Management Strategies and social science linkages is holding back receiving benefits from the things at which PICES is outstanding.
- We can't fix social sciences in short term; we CAN improve the formality of sectoral management approaches

Putting PICES Knowledge to work

- Management Strategy Evaluations are evaluations RELATIVE TO SOMETHING
- The “Somethings” are the Management Objectives
 - Frameworks for Objectives for TARGET SPECIES have long history (Fish Mgmt reference points)
 - Objectives for SOCIAL AND ECONOMIC GOALS only rarely explicit in value, jobs, etc,
 - *We can help* but we can't lead
 - Objectives for ECOSYSTEM PROPERTIES – the thing we CAN do more and better

The types of Ecosystem Objectives

Conservation Objectives

- to protect ecologically significant areas, species & community properties, biodiversity, vulnerable marine ecosystems, etc (Limits)
 - Dependent solely on ecosystem processes (structure and function)
 - “Set by the sea”

Usage Objectives

- State of the stock / ecosystem necessary to provide desired social, economic, cultural benefits (Targets)
 - Dependent on society’s policy choices & aspirations
 - Set through the governance processes

Sources of Conservation Objectives in Canada (OAP)

All science based, independent of human uses and pressures

- Ecologically and Biologically Significant **Areas**
- E.B.S. **Species** and **Community Properties**
 - Both based on explicit criteria
- Depleted species
 - From assessments by DFO or COSEWIC
- Degraded areas (not made operational)

Detailed information in a later talk

MUST USE ALL THE ECOLOGICAL KNOWLEDGE IN 1 (forcers) AND 2 (footprints)

Use of Conservation Objectives

- These become envelop / boundary within which sustainability of possible **usage objectives** is evaluated
 - How big a perturbation would achievement of the S/E objective cause (risk-based)?
 - Would the perturbation move the system outside the Conservation Objective boundaries?
 - Yes – Change goals or means of achieving them.
 - No; OK, but are there transition costs to be able to produce benefits? If Yes – will society pay them?
- ITERATIVE & DYNAMIC PROCESS, needs Science!
- **This process makes Science part of 3 & 4**

Why 3 and 4 are our business.

- Dynamic process of objective setting makes users and social science partners essential (**GOVERNANCE**)
 - Work with sociologists, anthropologists, political scientists, economists, to make goals measurable and translate into ecological states.
- Cannot evaluate of sustainability of possible Usage Objectives (is the footprint within the envelop?) without considering other activities in the sea (**INTEGRATED**)
 - Necessary to consider aggregate impacts of many activities.
 - Drive for Strategic Environmental Assessments for fisheries, as is case for other activities

How to get to IM within an Ecosystem Approach

- Option 1 – Incremental Sectoral Approach
 - For each human activity being managed, undertake process for setting Objectives – Limits AND Targets
 - Consider more factors (ecosystem footprint)
 - Attractive: tractable,
 - allows incremental adjustments,
 - possible with existing governance
 - RISKS –
 - of Inefficiencies –
 - » Redundancies and gaps in support
 - to ecosystem; no guarantee of :
 - » Attention to key ecosystem properties
 - » **Compatibility of separate sectoral objectives**

How to get to IM within an Ecosystem Approach

- Option 2 – Core Ecosystem Properties Approach
 - FIRST identify key ecosystem properties and set Conservation limits
 - Consider how sectors may pose threats to the key properties
 - Allocate sustainable impacts among sectors that will cause impacts due to Usage Objectives
- Benefits
 - Protects ecosystem structure and function better (“Outcomes” not “Outputs”)
 - Inherently considers cumulative effects and synergies
- Disadvantages
 - Needs new governance systems!
 - Allocation of access to impacts is HARD!

BOTH approaches need new governance

- Accountability for indirect effects of activities
- Need to resolve overlap / interactions of impacts
- Requires need approaches to INCENTIVES
 - Major conclusion of many meetings (FAO, ISFMS) is that INCENTIVES have more effect on achieving sustainability than amount of ecological knowledge
 - Oil & gas leases, mining rights, SECURE FISHERIES ENTITLEMENTS
 - What is the “currency” for Biodiversity incentives?
 - Cannot give secure entitlement to that currency!
- **IM and inclusive governance at least provide forum for discussion of these issues!**

Ecosystem Approach - Review

- FOUR COMPONENTS - Forcers, Footprints, Integrated Management and Governance
- PICES excellent at 1, OK at 2, largely out of the game with 3 & 4
- Work to convert ecological knowledge into Conservation Objectives requires a forum for the work and a framework to apply them.

Review

- There will be few benefits from knowledge gained in 1 and 2 without Ecosystem Objectives and effective implementation in management planning and operations
- Effective Implementation requires dealing with GOVERNANCE for planning, impact analysis & evaluating and adopting management rules and options
- Effective Implementation requires dealing with INTEGRATED MANAGEMENT for determining sustainability of AGGREGATE/CUMULATIVE impacts, and for allocating impact among competing users.

Approach 2 only one that can succeed in long term

- Sectoral approach antagonistic to integrating decision-making and keeping total impact within Conservation Objective boundaries
- Starts from greatest needs of ecosystem and works out, not most direct impacts
- Uses ecosystem knowledge most completely
- Supports addressing cumulative and aggregate effects of multiple activities
- WILL BE HARD JOURNEY TO GET THERE, but builds on what PICES is good at.