Ecosystem Approach to Management – What Next

Jake Rice  (DFO)
Senior National Advisor – Ecosystem Sciences
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** - Force, 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.