

How can the Ecosystem Approach be applied to Scottish (Regional) Marine Planning?



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Summary of Key Findings

Background

The 1992 Convention on Biological Diversity describes the Ecosystem Approach as 'a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way'. It is a framework for assessing biodiversity and ecosystem services, and evaluating and implementing potential management responses. The approach has been further elaborated in a set of 12 'Malawi' principles (see text box).

The Marine (Scotland) Bill, as introduced to the Scottish Parliament on 29th April 2009 will, when enacted, provide a statutory requirement for marine planning at both national and regional levels in Scottish waters. The Bill endorses an Ecosystem Approach to marine planning and management, in line with the requirements of the European Marine Strategy Framework Directive.

The Ecosystem Approach (Malawi) Principles

1. The objectives of management of land, water and living resources are a matter of societal choice
2. Management should be decentralised to the lowest appropriate level
3. Ecosystem managers should consider the effects (actual or potential) of their activities on adjacent and other ecosystems
4. Need to understand and manage the ecosystem in an economic context
5. Conservation of ecosystem structure and function to provide ecosystem services should be a priority
6. Ecosystem must be managed within limits of their functioning
7. The approach should be taken at the appropriate spatial and temporal scales
8. Process and objectives for ecosystem management should be set for the long term
9. Management must recognise that change is inevitable
10. Seek the appropriate balance between integration, conservation and use of biodiversity
11. Decision-making should consider all forms of relevant information (scientific, indigenous and local)
12. Involve all relevant sectors of society and scientific disciplines

Research Project

This research investigated how the Ecosystem Approach might potentially be applied to planning within Scottish Marine Regions (SMRs). It examined Ecosystem Approach criteria for the marine environment and methods for their application.

The research proposes an integrated framework to guide regional planners, based on an existing framework used by the Helsinki Commission (HELCOM) and two environmental models, the Driving forces-Pressures-State-Impacts-Response (DPSIR) Model as adopted by the European Environmental Agency, and the Oslo-Paris Commission (OSPAR) Ecological Quality Objective (EcoQO) Model. This framework is supported by a structured method of application based on guidance published by the International Council for the Exploration of the Sea (ICES). The research also considers the institutional capacity required to translate the proposal from a high-level framework to more specific guidance.

Key Points

- To apply the Ecosystem Approach to the long-term management of activities and resources through marine planning, the process must:
 - consist of co-ordinated environmental and socio-economic objectives;
 - be based on an integrated decision-making system that has strong stakeholders participation;
 - be supported by adaptive management approaches, with monitoring, and research and development.
- There are a number of key issues that require further attention in order to produce more specific guidance for policy-makers:
 - Directional guidance on key policy areas e.g. biodiversity conservation
 - Definition of 'Good Environmental Status'
 - Ecological Capacity and Cumulative Effects
- There will also be a need to develop co-ordinated capacity among key agencies to support integrated monitoring and adaptive management.

Application Framework

Figure 1 identifies the proposed Ecosystem Approach Application Framework, and associated stepwise process of implementation. The framework is intended to allow development of strategies that balance conservation and sustainable use within a Marine Planning context.

The Vision describes the overall ambition and desired outcome for the marine environment.

Strategic Goals would be used to define major themes deemed important to ecosystem integrity. Ecological Objectives describe central characteristics of a healthy ecosystem.

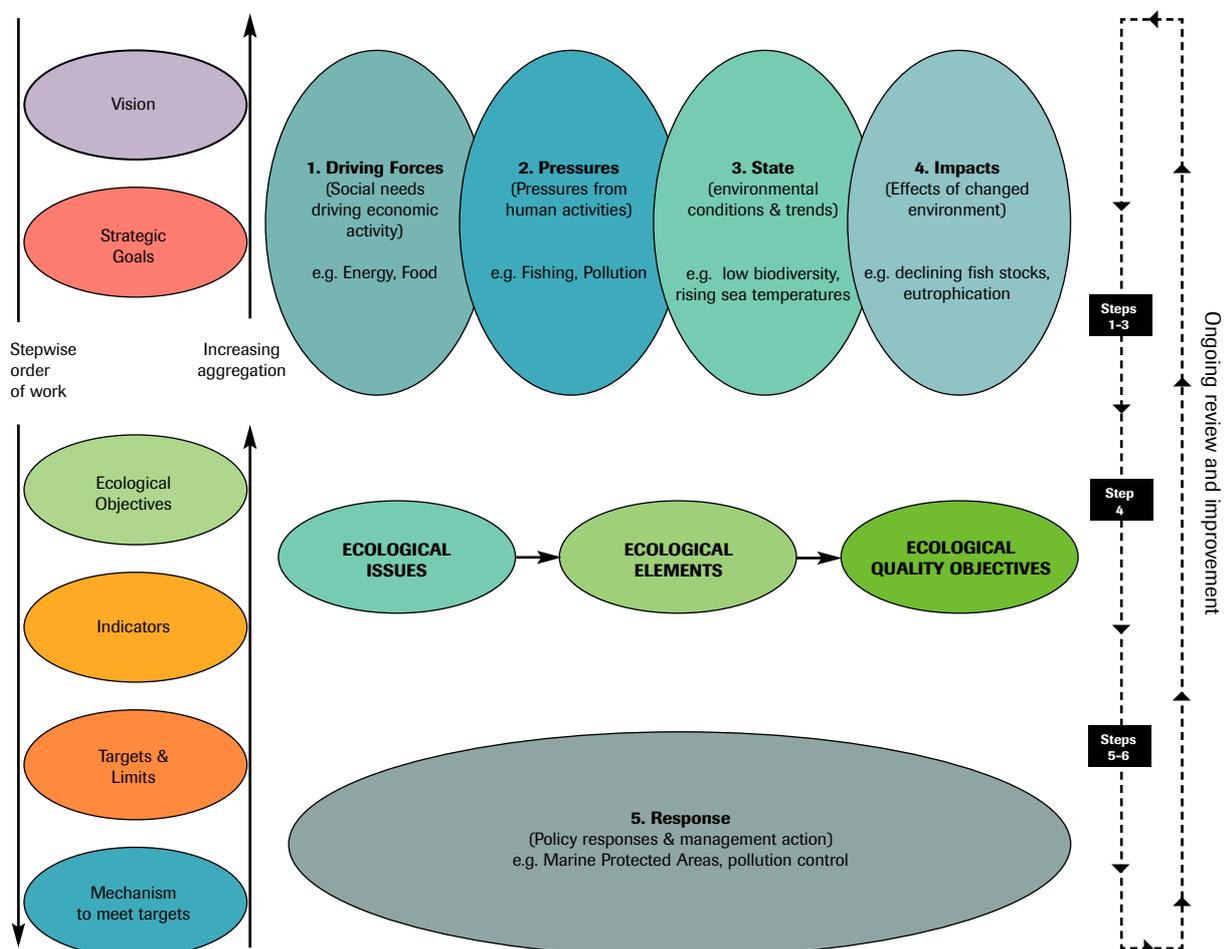
Indicators of ecosystem status provide a method of monitoring progress and must be accompanied by Targets which define the indicator value, and represent acceptable deviation from reference levels. Progress to achieving the Vision would be monitored by deviation from Targets, and therefore Specific Management Mechanisms that can be initiated to implement change where required are attached to each objective.

Two models have been identified that would provide guidance on how to achieve each of the hierarchical levels in the framework: the DPSIR Model and the OSPAR Ecological Quality Objective (EcoQO) Model.

DPSIR Model: This model aims to develop a robust system for marine environmental data management. Systematic consideration of issues ensures that important matters are not overlooked. The model seeks to identify and build links to human activities and the associated impacts on the environment, with the aim of developing appropriate management plans to minimize impacts.

EcoQO Model: This model provides additional guidance for translating the analyses carried out under the DPSIR model, into quantifiable ecological objectives that can direct policy.

Figure 1: Proposed Ecosystem Approach Application Framework and stepwise process of implementation.



Operational Guidance for Implementing the Proposed Framework

Step1: Scope the Current Situation:- compile information that will inform development of policies that seek to achieve 'Good Environmental Status' (GES).

Step2: Contrast with the Vision:- provides the basis for development of strategic goals and effective policies and management measures. The involvement of a range of stakeholders in defining the vision is central to the application of the Ecosystem Approach. At a regional level the vision should be drafted by the regional planning authority and consulted on prior to a final vision being adopted.

Step3: Identify Important Ecosystem Properties and Threats:- complete a comprehensive cross-analysis of the ecosystem properties that determine 'GES'; and issues regarding status, against major human activities impacting the marine environment. This will identify major threats to ecosystem status, as well as where additive or synergistic impacts of human activities may occur, so highlighting areas requiring higher priority management or more detailed sub-regional planning. Statutory advisors, regional planning partnership members and the wider stakeholder audience should be consulted on the outcome of such analyses, to ensure that both ecological scientific reasoning and societal values direct policy.

Step4: Setting Operational Ecological Objectives:- this is central to the compatibility of ecological management and sustainable development. SMRs should have objectives that are complementary to national level objectives, taking into account regional characteristics. They should be realistic in number to allow coherent and integrated management, and should be based on major ecosystem components. They should give consideration to existing long-term monitoring programmes to improve the robustness of analyses.

Step5: Ongoing improvement, adaptive management:- a precautionary adaptive management system should support policy on areas in the marine plan where 'unknowns' are identified. It would achieve this by attaching precautionary measures appropriate to the level of information available. The application of these measures would be informed by the findings of a monitoring programme. Adaptive management systems are also necessary for consideration of natural dynamics, and to assess the effectiveness of management strategies where 'uncertainties' are less of an issue.

Step6: Periodic Reviews:- This will allow new scientific knowledge, ongoing changes in ecosystem status and changing societal needs to be incorporated, and ensure that strategic goals remain relevant and fit for purpose. This step is therefore directly linked to step 5, and should be an in-built component of the monitoring programmes for adaptive management strategies.

Key Challenges

This section sets out key challenges to implementing the proposed framework and proposed solutions to these.

Directional Guidance on Key Policy Areas

In order for sustainable economic development to take place, there must be a common understanding of conservation objectives in Scottish waters. Guidance should be provided by Marine Scotland, with proactive inputs from key advisory agencies such as SNH.

Regional planners should be provided with a set of criteria on which to base policy developments that will ensure that regional analyses give appropriate consideration to priority ecosystem components.

Defining 'Good Environmental Status' (GES)

There is no overarching concept of what 'good environmental status' (GES) is for the marine environment. Without clarification of this concept, regional planners may struggle to develop and implement sustainable marine management to achieve GES.

To ensure consistency of status determination within and between ecosystems, the development of Marine Ecosystem Objectives at the national level needs to be translated to the regional level. This should include clarification of what are realistic ecological references, or baseline status points at various management scales and will require input from key advisory bodies such as Marine Scotland and SNH.

The Role of Strategic Environmental Assessment (SEA)

SEA plays a central role in the application of the Ecosystem Approach. The synthesis of information required in step 1 will be achieved by the baseline scoping stage of the SEA. SEA will also be useful to inform discussions in step 2 to achieve consensus on the Vision, by providing alternative scenarios for the region. Furthermore, SEA will support and enhance the application of the Ecosystem Approach by ensuring that mitigation and enhancement proposals are incorporated in the Plan, and will assist in the identification of an appropriate and comprehensive monitoring system.

Ecological Capacity and Cumulative Effects

Central to ecosystem-based marine spatial planning is consideration of the overall ecological capacity of a planning area and adjacent affected areas. In order for cumulative effects to be fully considered, policy development should be directed by reference to integrated ecosystem limits, rather than sector specific limits. This is challenging, and requires knowledge of all impacts. Work will also be required to determine overall limits that should not be breached and should be linked to work carried out for setting Marine Ecosystem Objectives. Guidance for regional planners will be required from Marine Scotland, to ensure that the cumulative effects of all Scottish Marine Regional Plans do not breach the overall carrying capacity of the Scottish marine environment.

Integrated Monitoring

Implementation of an effective monitoring system requires sufficient and appropriate institutional capacity to enable an integrated approach including information sharing, and the translation and communication of scientific knowledge to support policy decision-making. Efforts will be required to identify how such an integrated approach might work in practice, and will require co-ordination and co-operation from various bodies (Marine Scotland, SNH, SEPA, JNCC, Regional Planning Partnership Stakeholders).

There is often more than one possible indicator for each objective. The choice of indicators must facilitate a comprehensive review of the region, and should primarily be chosen on their ability to provide the necessary information for management decisions, rather than for convenience. Advice from key advisory bodies (Marine Scotland, SNH, SEPA, JNCC) will be necessary to ensure that efficient and effective monitoring programmes are put in place to achieve GES.

Conclusions

This research provides an integrated method by which the Ecosystem Approach can potentially be applied to Scottish (Regional) Marine Planning. It has also highlighted that currently there are many 'uncertainties' that present practical difficulties in producing Regional Marine Plans that fully endorse the Ecosystem Approach.

In this context marine planners will require the development, by Marine Scotland and associated agencies, of 'ground-level' guidance on topics including: key marine policy areas; definition of GES; and ecological capacity and cumulative effects. Such guidance will provide a basis for proactive Ecosystem Approach management strategies.

With the first Scottish Marine Bill reaching Royal Assent, there are opportunities for Marine Scotland, and other key advisory bodies, to work with Regional Planning Partnerships, to translate work being conducted at the National and European level, into useful guidance for Regional Planning. The development of such guidance will ensure consistency in the application of the Ecosystem Approach to planning and management of the Scottish Marine Environment.

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