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Introduction

The Contracting Parties to the Barcelona Convention are moving towards an ecosystem approach. They have agreed to a seven step process, which includes 1) determining an overarching vision for the Mediterranean as a whole; 2) elucidating strategic objectives for achieving that vision; 3) undertaking a preliminary assessment of the environmental condition of the Mediterranean; 4) determining ecological objectives; 5) determining operational objectives and related targets and indicators; 6) revising monitoring programmes for periodic assessment, regular updating of targets, and guiding changes necessary for an ecosystem approach to management; and 7) developing relevant action plans and programmes. This is a long term process which builds on what Mediterranean countries are already doing but builds a system which in some years' time will prove to be undeniably more effective and efficient.

Steps 1 & 2 of the ecosystem approach roadmap have been completed. The draft integrated assessment (step 3) is now being finalized, and will be reviewed at the present second expert meeting on ecosystem approach and in subsequent months.

The next steps that need to be discussed during the current phase of the roadmap are the development of the ecological objectives (step 4), the development of operational objectives, the indicators to be used, and the targets (step 5) for good environmental status in the different water bodies.

In addition, the first meeting of experts on ecosystem approach held in Rome in April 2010, requested the Secretariat to prepare background papers for preliminary discussions on the future of monitoring, management effectiveness, work plan 2010-2011 for implementing step 4 and 5 of ecosystem approach and timetable for implementing the ecosystem approach roadmap. The purpose of this paper is to launch discussions on these issues.

1. Defining a methodology for developing the Ecological Objectives (EO)

The assessment that precedes the determination of ecological objectives (EOs) is key in providing the necessary information for determining such objectives, and ultimately, for determining management objectives and plans.

However, given the scale of the Mediterranean and the mosaic of management interests and jurisdictions, it will be necessary to focus on only the most important ecological objectives in moving towards an ecosystem approach. It is assumed, *a priori*, that determining ecological objectives will involve prioritization, such that management issues of the greatest concern and elements of the Mediterranean system that are under the most threat should be the focus for ecosystem approach.

There are several ways to achieve this:

1. *To highlight priority management issues or threats, and develop Basin-wide ecological objectives that present the best-case scenario with regard to each threat (or set of threats, as ecosystem approach is all about integration). The assessment is useful in emphasizing salient issues of concern (including human health effects, loss of biodiversity, reduced delivery of ecosystem services, declining value of marine and coastal resources, and equity and access), across the Mediterranean Basin and/or within the subregions.*

A modality to implement this option, is to use the 11 descriptors under the MSFD (essentially analogous to ecological objectives) to guide the setting of ecological objectives. These descriptors are essentially analogous to ecological objectives, and include: 1) biological diversity is maintained; 2) non-indigenous species are kept at low levels; 3) fisheries species maintained; 4) food web elements maintained; 5) eutrophication is minimized; 6) seafloor areas are left undisturbed; 7) permanent alteration of hydrological systems does not affect marine ecosystems; 8) contaminants do not give rise to pollution effects; 9) contaminants in seafood are below standards; 10) marine litter does not cause harm; 11) energy (e.g. noise) is minimized.

2. *Another way to prioritize is to use the existing information – either built from the ground up by using existing databases, or identified from the top down by expert opinion – to identify priority geographic areas that could potentially serve as focal points for the determination of ecological*

objectives. The criteria used to determine what constitute geographic priorities might include biodiversity richness, ecosystem services and value, ecological importance, vulnerability, rarity, condition, and representativeness (in any combination).

3. *A third way is to focus on both priority threats and priority areas. This is already the basis for much national, international, and non-governmental work in the region to establish priorities for conservation, for policy, and for research. MAP is suited to doing such threatened-areas-of-high-value analyses because it is a repository for data and has the technical ability to create meta databases, map information, and use GIS to efficiently pinpoint geographic priorities.*

In case Option 1 is adopted, several questions remain. These include:

- 1) Should all 11 MSFD descriptors/ecological objectives be considered and adopted?
- 2) Should the ecological objectives be amended to provide more detail and simply according to the realities presented in the Mediterranean context?
- 3) Should all descriptors apply to all areas? (Recognizing that targets for indicators can and should be adjusted)
- 4) How can the ecological objectives be used to maximize the value added of a regional, Mediterranean-wide approach?

It is clear that information already exists within MAP and other fora to support the tracking of many of the indicators associated with these eleven descriptors.

In case another approach is adopted, the definition and implementation of ecological objectives methodology would require the establishment of the necessary scientific processes, thus needing additional resources and time.

However, developing ecological objectives is not sufficient; a system that establishes operational objectives through indicators and targets, and which tracks whether objectives are being met is a daunting process for an area as vast and diverse as the Mediterranean Sea. A demonstration project (or two, or three) might be a good tangible step to take towards the more ambitious ecosystem approach goal. Choosing pilot areas to test would allow testing of appropriate ecological objectives and development of useful indicators. Pilot areas could be chosen based on a given set of criteria (e.g. critical areas for mega-vertebrates), or from priority areas already chosen in different contexts, such as the transboundary diagnostic analysis (2005) priorities, the 25 existing SPAMIs or the areas identified by UNEP/MAP as areas of conservation interest.

Establishment of a consultation mechanism with representatives from the scientific and research institutions could be useful to provide advice to the process of the definition of the ecological objectives.

2. Elements for a MAP Integrated Monitoring Strategy

While it is premature to discuss the details of an optimal monitoring programme in advance of having determined ecological objectives, operational objectives, and targets, the assessment has already highlighted several issues concerning future monitoring. In addition it will be useful to have monitoring considerations in mind during the discussions on ecological and operational objectives. The state-of-the-art with respect to UNEP/MAP legal provisions on monitoring and the monitoring programmes implemented over 35 years in MAP is presented for information purposes in document UNEP(DEPI)/MED WG.350/Inf.3.

The following considerations may be addressed with regard to key monitoring features and expected challenges, building on and further developing the values of the current UNEP/MAP monitoring programme;

- Extending the scope of monitoring along the lines of ecological objectives to a wider spectrum of issues (including marine pollution and biodiversity) and geographical coverage;
- Monitoring key threats from different sources as well as from other sources, as well as the interaction among the threats;

- Synergies with MSFD and other monitoring programmes implemented in the region with a view to sharing data and enhancing the effectiveness of environmental monitoring in the Mediterranean on the regional and country levels;
- Collecting compatible data.

2.1 Extending the scope of monitoring in line with ecological objectives

- There is a need to organize an integrated holistic monitoring programme covering marine pollution, biodiversity and other priorities, in line with the objectives and steps agreed upon for the application of the ecosystem approach.
- Such an integrated monitoring programme has to be developed as a follow-up to the definition of Mediterranean ecological objectives.

2.2 Monitoring Trends and Interaction among threats

- To derive the information needed for an ecosystem approach, mechanisms to derive trends efficiently and effectively should be explored.
- Thought should also be given to “early warning systems” which could alert governments and institutions to the rapid approach towards critical thresholds, where such thresholds have been determined.
- One challenge which will be paramount in the implementation of the ecosystem approach will be that monitoring is designed to be streamlined and not add unnecessary burden to countries, but can derive meaningful information on the interaction between threats. (For instance, although pollution monitoring is already providing very useful information about pollutant loading around designated sampling stations, and fisheries data provide some indication of level of effort, catch, and stock of target species, there are currently no mechanisms in place to determine how the environmental quality is changing in response to the cumulative and combined effects of pollution and fishing). An integrated monitoring strategy should inform understanding of these synergistic effects.

2.3 Synergies, enhancing environmental governance on monitoring

In parallel with UNEP/MAP ecosystem approach process in implementing Decision IG 17/5 of the 15th Meeting of the Contracting Parties, January 2008, Almeria, Spain, European countries, under the MSFD, adopted in 2008, have embarked on a process to evaluate good environmental status, determine targets and indicators, and design coordinated monitoring programmes for future assessment.

In this regard, an important issue is the extent to which an integrated monitoring strategy, for the Mediterranean as a whole can be harmonized with requirements for monitoring that will emerge from the MSFD process. This is not to say that non-European countries will be burdened with tracking all the indicators that will be agreed to in the EU context, but rather that non-EU countries in the course of their fulfilling commitments under MAP, be guided and assisted in providing information which is relevant to the Mediterranean and compatible with information coming from the EU countries. In this way, a rigorous and defensible Mediterranean-wide system for monitoring can be adopted. Furthermore, the Mediterranean community will be able to provide leadership by demonstrating the practical application of monitoring and assessment for an Ecological Approach, which will greatly benefit the Mediterranean as a whole. It is also important to take into consideration global developments that may affect monitoring, such as assessment of assessment process, Transboundary Water Assessment Programme, UNEP/Regional seas, etc.

2.4 Collection of compatible data

Collecting compatible data is a challenge. In this regard, compatible data could also be obtained from “outside” sources of information: scientific studies undertaken by academic institutions in the region, metadata analyses undertaken by other regional inter-governmental institutions such as CIESM, GFCM, IUCN, WWF etc.; information derived from remote sensing; and/or information inferred from modeling. The collection of such compatible data

would allow gaps to be filled, while enhancing the integrated regional monitoring leadership by UNEP/MAP. The value added of a regional approach cannot be understated: a UNEP/MAP-led optimum integrated monitoring strategy will allow the tracking of geographically large scale trends, will pinpoint issues and areas in areas beyond jurisdiction, and will allow transboundary opportunities to be highlighted.

3. Management Effectiveness Evaluation

In order to determine what additional (or different) management activities need to be carried out to move towards an ecosystem approach, existing management must be assessed. Management effectiveness evaluation is different from systematic monitoring of environmental quality. In effect, such an evaluation would optimally provide the data needed to assess to what extent management has been effective and has contributed to meeting the ecological objectives.

In addition, there should be some distinction made if the ecological objectives are not met because management is insufficient or because of regional or global factors which cannot be controlled (ocean acidification undermining the ability to support food webs, for instance).

Management evaluation must look at three elements:

- 1) existence of regulations and/or management plan;
- 2) enforcement of regulations; and
- 3) actual compliance with regulations.

In situations where all three of the above conditions are met and yet degradation continues, further assessment must explore whether the management in place was designed properly (in other words, is the management solution presented by the management regime appropriate for resolving the management problem?).

Because the underlying premise of the ecosystem approach is that integrated management is more effective than sectoral management, assessment must consider all prevalent activities that impact an area or ecosystem, not just one kind of activity/pressure/threat.

Future discussion should also focus on the coming together of the two information streams: one on environmental condition (provided by environmental monitoring programmes), the other on management/measures evaluation.

The Contracting Parties are reporting since 2003 on measures taken to implement the Convention and its Protocols and the decisions of the meetings of the Contracting Parties.

With a view to facilitating reporting on the effectiveness of such management measures in 2009 the Contracting Parties adopted for the first time and for testing purposes, a list of effectiveness indicators (Decision IG 19/4). Forty-four indicators were identified on the basis of an in-depth analysis of the legal provisions of the Conventions and its Protocols and data availability. The set contained process and output indicators while state and/or impact (outcome) related indicators were not yet included. More detailed information on the rationale, criteria and methodology followed for selecting the current set of MAP effectiveness indicators and gaps is presented for information purposes in document UNEP(DEPI)/MED WG.350/Inf.3.

To ensure that the testing of effectiveness indicators is carried out in line with ecosystem approach, the Secretariat highlighted at the meeting of the Bureau of the Contracting Parties held in May 2010, Rabat, Morocco, the need to link both processes. The Bureau agreed with this proposal, leaving the technical discussion on this matter to expert meetings.

Therefore the proposal of the Secretariat is to:

- Use the information gathered under the regional assessments process to prioritize which indicators from the list to pilot

- Invite a limited number of the Contracting Parties to volunteer in testing the indicators relevant to the priorities agreed through the assessment process as part of the preparation of their national implementation report for 2008-2009,

As a result, during 2011 it would be possible to enrich the Chapter on commonalities of the integrated assessment report with information on management that may be used as baseline to measure effectiveness. The added value would be the alignment of effectiveness indicators with the agreed ecological and operational objectives as well as the definition of the geographical scope of process indicators (based on issues, areas, national, sub-regional levels as appropriate).

In terms of process, the outcome of such an exercise will be shared with the ecosystem approach expert group in 2011 and further institutionalized through formal discussion at the meetings of the focal points of the concerned MAP components.

4. Criteria for proposing a timetable to implement the roadmap on ecosystem approach

In the views of the Secretariat, there are 5 criteria that should be considered in formulating the implementation timetable of the ecosystem approach roadmap.

1. *The Contracting Parties have committed themselves to ensure gradual implementation of the roadmap due to the complexity of the process and its challenges. This requires a process which guarantees country ownership.*
2. *The ecological and operational objectives should be identified as a matter of priority in order to inspire and lead the efforts of all concerned Mediterranean actors to take coherent actions.*
3. *Implementation by 2014 of the following outputs of the five-year strategic MAP Programme of Work will concretely advance the application of the ecosystem approach: a) drafting the integrated monitoring strategy; b) revising SAP BIO; c) adopting legally binding measures for other priority substances of the LBS protocol; and d) revising the action plans for endangered species in order to implement at a regional policy level the agreed ecological and operational objectives, including regional targets.*
4. *Necessary synergies are to be identified and established with other relevant regional and global processes, in particular in the framework of the MSFD with a view to optimizing the outcome arisen from both processes, thus ensuring substantial coherence as appropriate, efficient use and mobilization in a concrete manner of external resources. In particular, contradictory implementation timeframes are to be avoided.*
5. *MAP ecosystem approach process should be the fora where the 7 EU member states that are Party to the Barcelona Convention and its Protocols are to implement the EU MSFD requirements.*

With regard to the biennium 2010-2011, five major outputs are considered to be the key priorities to advance the implementation of ecosystem approach roadmap, the outcome of which is expected for submission to the 17th Meeting of the Contracting Parties:

1. *Finalization of the assessment reports and associated activities related to GIS and other mapping tools*
2. *Definition of ecological and operational objectives*
3. *Definition of indicators and targets, as appropriate*
4. *Development of a timeframe for implementing the roadmap of ecosystem approach*
5. *Intense intergovernmental consultation process for every step of the roadmap implementation.*

WORKPLAN SEPTEMBER 2010- NOVEMBER 2011

OUTPUTS	Sept-Dec 2010				Jan-Mar 2011			Apr.-Jul 2011				Sep-Nov 2011		
	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	SEP	OCT	NOV
1. ASSESSMENT REPORT														
<i>1.1 Mapping/GIS finalization</i>														
<i>1.2 Incorporation of CPs comments</i>														
<i>1.3 Incorporating regional organizations information</i>														
<i>1.4 Incorporating information on management measures</i>														
2. ECOLOGICAL OBJECTIVES (EO)														
<i>2.1 Prioritization issues/areas</i>														
<i>2.2 Definition of EO methodology</i>														
<i>2.3 Selection of EO</i>														
3. OPERATIONAL OBJECTIVES														
<i>3.1 Analysis of possible indicators, including the effectiveness indicators</i>														
<i>3.2 Selection of indicators</i>														
<i>3.3 First discussion on targets including prioritization for selected indicators, as appropriate</i>														
<i>3.4 Definition of targets¹</i>														
4. ECOSYSTEM APPROACH TIMETABLE														
5. INTEGGOVERNMENTAL MEETINGS		2			3							4		

1. Pending availability of data
2. Pending availability of funds
3. Pending availability of funds
4. Back to back with MAP Focal Points meetings

ANNEX I

GLOSSARY OF TERMS

Note: there are no formally agreed to definitions for the terms used in Ecosystem-Based Management, or an Ecological Approach. These definitions pertain to the ecosystem approach process in the Mediterranean Sea, and are presented as discussion items, not as consensus definitions.

Ecosystem Approach (EA): A means of prioritizing and integrating management so that major impacts to ecosystem productivity and function are avoided. In the case of the Mediterranean, the steps towards an ecosystem approach include setting the vision and strategic goals for all Mediterranean ecosystems; undertaking an initial assessment; setting ecological objectives that better define the strategic goals; setting operational objectives that reflect major management priorities; determining targets for those objectives and the means by which progress towards those targets can be tracked (indicators); and establishing a monitoring program so that periodic assessment can track progress towards an effective management regime based on an ecosystem approach.

Ecological Objective: Normative description of the desired ecological and environmental condition, or "how it should be", specifically directed at a particular parameter of the ecosystem. Examples of ecological indicators include: no human-induced loss of marine biodiversity; damage to the seafloor by human activity is kept below levels where it might cause ecological disturbance and harm; levels of heavy metals do not exceed natural conditions. The choice of ecological objectives must reflect the priority threats to the ecosystem.

Target: Specific, quantifiable aim for management; for instance, by (date), over-fishing is eliminated; by (date) 100% of cities with over 50,000 inhabitants have primary and tertiary sewage treatment facilities.

Indicator: Parameter that can be measured to see if target (see below) is being met; examples include number of stocks that are assessed as being overfished; degree of sewage treatment per particular-sized urban area; number of species determined to be threatened. Indicators must not only be measurable in theory, they must be chosen with feasibility in mind.

Descriptor: In EU parlance, a descriptor characterizes a particular feature of the desired environmental condition (known as GED or Good Environmental Status). Under the Marine Strategy Framework Directive, there are eleven descriptors of GED, each of which aims for the absence or reduction of a particular kind of impact or threat (e.g. loss of biodiversity, damage to seafloor, litter, noise, etc.). In effect, the EU descriptors are one and the same as the ecosystem approach ecological objectives.

Management Effectiveness Evaluation: An assessment of the degree to which management is having the desired result; in other words, whether management objectives are being attained through the management measure adopted. Management effectiveness can be measured using management indicators; the three underlying causes of whether a management measure is effective is 1) suitability of the management measure to address the particular threat; 2) degree to which the regulations associated with the management measure are enforced; and 3) the extent to which there is compliance with the regulations. In general, the more specifically articulated the management objectives, the easier it is to measure management effectiveness. That said, in the absence of monitoring of compliance, it will be difficult to ascertain management effectiveness, even when management objectives are spelled out clearly and with specificity.

One further note about the ecosystem approach process: it is not intended to encompass all management of all human activities that impact Mediterranean marine ecosystems, but rather the most salient impacting activities. The point of an ecosystem approach is to integrate management (and research and monitoring) so that management effectiveness is improved overall. Prioritization will be necessary to develop an ecosystem approach management regime that addresses the most critical threats, and in so doing, maximizes management effectiveness.