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Strategic Partnership for the Mediterranean Sea Large Marine Ecosystem (MedPartnership)

MedMPAnet Project

Regional Project for the Development of a Mediterranean Marine and Coastal Protected Areas (MPAs) Network through the Boosting of MPAs Creation and Management



GUIDANCE FOR BUILDING MARINE PROTECTED AREAS NETWORKS

Guidelines to improve the implementation of the Mediterranean Specially Protected Areas network and connectivity between Specially Protected Areas

MedMPAnet

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Preface

Countries throughout the world have committed to improving the protection of the ocean using Marine Protected Areas. Many countries are taking active measures to implement this protection, moving from individual MPAs and groups of MPAs towards full scale MPA networks. Given recent progress and awareness in the Mediterranean it is very timely to look at how this may be best achieved, and in so doing create a common language, and a common and consistently applied framework for action. Such an approach can provide a renewed opportunity to bring together diverse players to better safeguard the regions wildlife and increase the flow of marine environmental benefits, both now and for future generations.

The need to address SPAs representativity, replication and their connectivity in the Mediterranean is, in reality, the need to understand and deliver systematic conservation planning and best practice in applying MPA network design principles. The fundamental assumption has been made therefore from the outset that these guidelines must clearly support the SPA process, but must also set out the ground work for the MPA network as a whole, and must be of added value and relevance to all MPA activities in the region.

These guidelines set out a high level 'how to do it' guide, focussed on SPAs and the key criteria requested, but with a far wider common approach application to other MPA types. This common approach is so that the greatest use can be gained in the Mediterranean from this guidance. It explains in a step-wise way the best practice application of network design principles such as representativity, replication and connectivity, so, through systematic conservation planning, the contribution of SPAs to the Mediterranean MPA network can be increased.

To provide such guidelines within just a few pages is not only challenging but also has meant several important assumptions have needed to be made from the outset. These assumptions sometimes reaffirm existing decisions, but coupled with the strategic nature of this guidance, means that a resultant delivery process will need to be put in place. This process is needed to drive the cooperation and range of actions ultimately required to deliver an effectively and equitably managed, ecologically representative and well connected MPA network in the Mediterranean.

Over twenty separate recommendations are made to help make it as easy as possible to match current SPA and MPA network activities to key issues raised by these guidelines.



Golf of Bumba, Libya (© RAC/SPA, Mathieu Foulquié)

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Kuriat Islands, Tunisia (© Louis-Marie Préau)

1. BACKGROUND TO THE NETWORK GUIDELINES

The conservation of the ocean and seas remains a pressing issue of concern for many countries. Conscious of the pressures on the ocean's finite resources, international commitments direct nations to provide the ocean with greater protection, primarily by establishing networks of Marine Protected Areas (MPAs), but also through implementing a range of broader spatial and sustainable management practices.

The focus of this report is to assist in the further development of the MPA network for the Mediterranean (Fig. 1). In particular, its purpose is to provide clear, strategic-level guidelines within just a few dozen pages to improve the implementation of the Mediterranean Specially Protected Areas (SPA) network and connectivity between SPAs. For the purpose of the work, the terminology "SPA" takes into consideration both marine and coastal protected areas. The guidelines set out here, however, equally apply to the development of a network of MPAs for the Mediterranean as a whole, needed to meet the Convention on Biological Diversity (CBD) MPA target (see section 2).

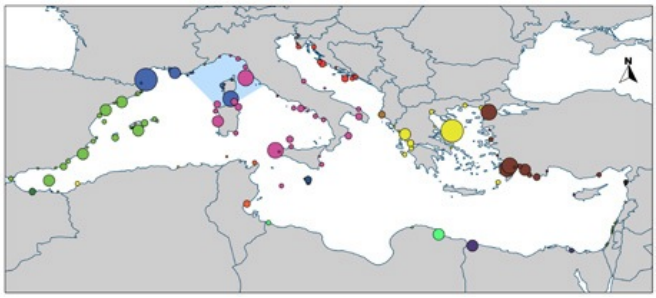


Figure 1. Surfaces distribution of MPA by country (Gabrié *et al.*, 2012)

These guidelines are therefore aimed in their narrower interpretation at supporting the Mediterranean countries to meet the objectives of the regional programme of work for Mediterranean marine and coastal protected areas. They are intended to be a resourceful document of advice and practical use for Parties, scientists, decision-makers and stakeholders involved in the establishment and management of SPAs, and the designing of SPA network. These guidelines accordingly provide a common methodological framework to answer the question on how to address representativity, replication and connectivity criteria when identifying new SPAs.



In particular, these guidelines:

- offer a broad methodological framework within which to consider representativity, replication and connectivity criteria when designing the MPA network, with a focus on the SPAs networks and identifying SPAs;
- provide some general guidance for improving representativeness, efficiency and functionality of networks of MPAs; and
- use examples based on the technical and scientific literatures to illustrate some good practices.

As background to these guidelines the Parties to the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean, currently named the Barcelona Convention, decided in 2008 to promote measures for the establishment of a comprehensive and coherent Mediterranean network of coastal and marine protected areas by 2012 (Almeria Declaration). Furthermore, the Marrakech Declaration (2009) called on States to continue the establishment of marine protected areas and to pursue the protection of biodiversity with a view to the establishment by 2012 of a network of marine protected areas, including on the open seas (Fig. 2, 3), in accordance with the relevant international legal framework and the objectives of the World Summit on Sustainable Development.

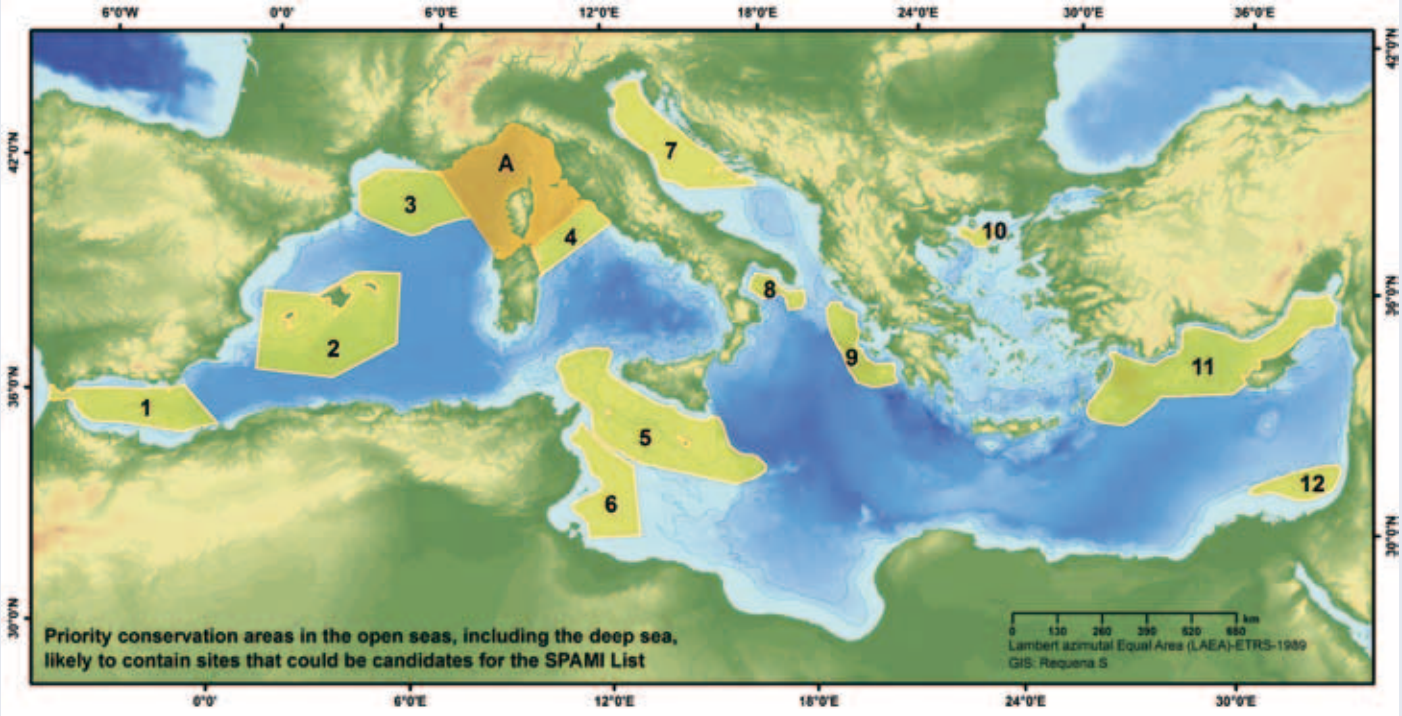


Figure 2. The 12 priority conservation areas identified by the RAC/SPA (RAC/SPA, 2010a). 1. Alboran Sea; 2. Balearic Islands area; 3. Gulf of Lion area; 4. Tyrrhenian Sea; 5. Northern Strait of Sicily (including Adventure bank and surrounding banks); 6. Southern Strait of Sicily; 7. Northern and central Adriatic Sea; 8. Cape Santa Maria di Leuca; 9. North-east region of Ionian Sea; 10. Thracian Sea; 11. North-east Levantine Sea and Rhodes Gyre; 12. Nile Delta region.

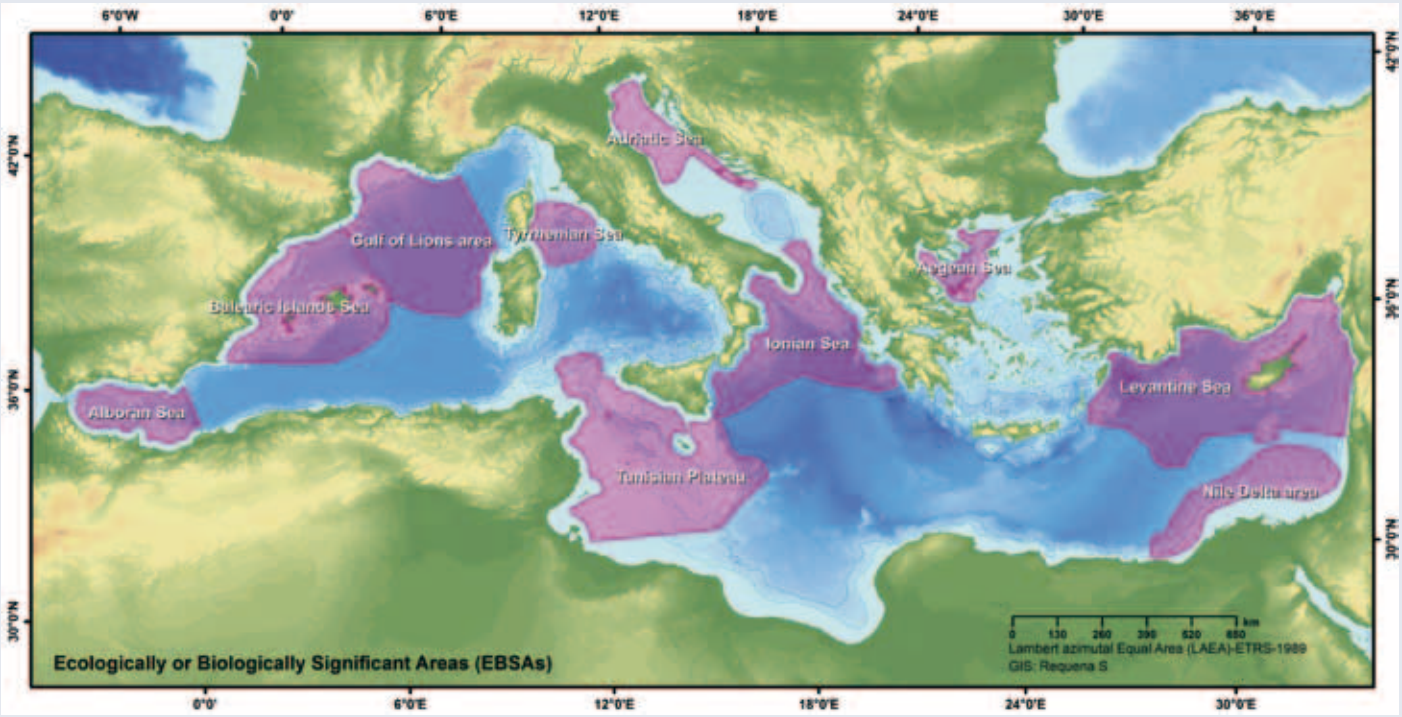


Figure 3. Ecologically or Biologically Significant Areas (EBSAs) identified by the RAC/SPA (RAC/SPA, 2010a).

At the same time, the Parties adopted a regional programme of work for Mediterranean Marine and Coastal Protected Areas providing recommendations for designing representative Marine Protective Areas (MPA) networks in the Mediterranean, including Open seas areas, in particular by adopting a three-step hierarchical planning approach:

1. At the largest scale, in this case that of the Mediterranean Basin, the first recommended step in designing ecological network is the identification of large scale ecological units;
2. At the next scale, priority conservation areas would be identified within each unit. These areas would not constitute MPAs themselves, but would be focal areas for individual MPA networks;
3. When such priority conservation areas are identified, the task of identifying sites to develop true ecological networks would be initiated.

In this framework, the Regional Activity Centre for Specially Protected Areas (RAC/SPA) considers that representativity, replication and connectivity are criteria that need to be used for the site selection process (step 3 of the process for designing a representative network of MPAs).

These guidelines demonstrate that such specific issues must be applied within a common, comprehensive, systematic conservation planning framework that includes such criteria, but also other considerations and issues stemming from international best practices.
Without using such an overall framework it will be difficult to develop SPAs and build the MPA network in an efficient and effective manner. Recommendations are made throughout on key issues raised by these guidelines to help focus debate and decisions about the best way forward.

2. AN INTRODUCTION TO MPA NETWORKS: SPEAKING A COMMON LANGUAGE

Whilst this may seem to be 'going back to basics' it is particularly important in evolving the existing SPA work and developing the future MPA network to have a common view as to why this action is needed and a common view on terminology that lies at the heart of the process.

The agreement to establish networks of MPAs results from the 1992 Convention on Biological Diversity subsequently reaffirmed and reiterated by a range of important fora, including the World Summit on Sustainable development, The IUCN Vth World Parks Congress, and the G8 Group of Nations. In the European context MPA networks are a central focus of activity in, for example, the OSPAR Regional Seas Convention, and enabled by policy instruments such as the Habitats Directive and the Birds Directive as well as providing support to implementation of other Directives such as the Water Framework Directive and the Marine Strategy Framework Directive. The latter are relevant to Mediterranean countries where they are a European Union Member. The SPAMI network provided for by the SPA Protocol to the Barcelona Convention, the Emerald network of the Council of Europe, The Agreement on the Conservation of Cetaceans in the Black Sea Mediterranean Sea and Contiguous Atlantic Area (ACCOBAMS), and UNESCO's World Heritage Convention are also of direct relevance. Mediterranean countries as elsewhere around the world therefore have strong obligations to put an MPA network in place – clearly many separate initiatives can contribute to the network that need to be drawn together in a timely fashion. Essential questions are (1) what do countries and authorities need to do to make this happen more effectively, and (2) what are the best way of bring this about drawing on the strengths of existing activities and best practices?
Under the original CBD decision governments have committed to reaching a target of protecting at least 10% of each eco-region by 2010, and establishing ecologically representative networks of MPAs by 2012. Given the challenges that many countries are facing in meeting this target, in autumn 2011 the global target was reviewed and revised when the CBD Parties met in Nagoya, Japan, named the Aichi declaration. The current target resulting from that meeting now reads:

Target 11: By 2020.....10 per cent of coastal and marine areas.....are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and ..... integrated into wider landscape and seascapes.

This recurrent emphasis on MPAs and MPA networks results from a growing and already significant body of evidence on the benefits they provide. When properly established and managed MPAs are one of the best tools we have for ocean ecosystem recovery and protection. Their benefits include (Toropova et al., 2010):

- conservation of biodiversity and ecosystems;
  building ecosystem resilience and resistance to impacts and change;
- arresting and possibly reversing the global and local decline in fish populations and productivity by protecting critical breeding, nursery and feeding habits;
- raising the profile of an area for marine tourism and broadening local and national economic options;
- providing opportunities for education, training, heritage and culture; and
- providing broad benefits as sites for reference in long-term research.



MPA networking could provide opportunities for education, training, heritage and culture (© RAC/SPA, Atef Limam).

Such benefits are not just of environmental value but also of economic significance and social importance.

The challenge facing many countries with the CBD MPA target is how to move from the current position of isolated or small groups of MPAs, to one where scale-up occurs, where progress is accelerated, and where new joint activities can deliver the intended proper functional MPA network.

3. SCALING-UP: THE DEVELOPMENT OF MPA NETWORK GUIDANCE FOR THE MEDITERRANEAN REGION

These MPA network guidelines, set in the Mediterranean context, and drawing on international best practices, are intended to provide a short, strategic overview and framework to support countries and agencies in delivering an effective network of MPAs for the entire region, with a focus on the SPAs and improving connectivity between them. Much good progress has already been made, or is underway, and initiatives such as the MedPAN-RAC/SPA database on MPAs (Fig. 4) provide an invaluable basis and tool in taking this guidance forward.

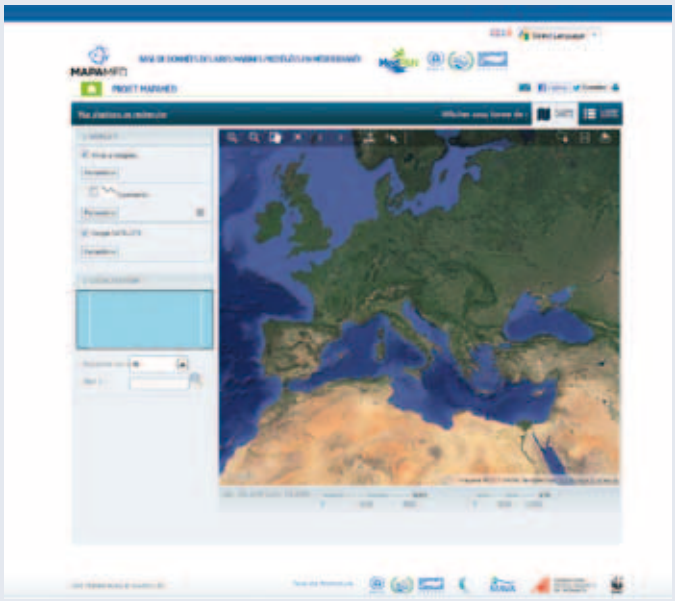


Figure 4. MedPAN-RAC/SPA database on MPAs provide an invaluable basis and tool for the Mediterranean network

The production of this network guidance is very timely. Despite attempts at reform and renewed actions, the most recent and most comprehensive analysis of MPAs for the Mediterranean region to date, released in 2008 (Abdulla *et al*., 2008), nevertheless concluded three things:

- That the original 2012 CBD target of protection of 10% is most likely not to be achieved for the Mediterranean;
- That the current Mediterranean MPA system is not representative or coherent; and
- That the management of Mediterranean MPAs needs to be more effective.

More recently analysis (Coll *et al*., 2012) has suggested that many areas of conservation importance lie outside the approximately 5% of the Mediterranean that currently falls within MPAs, with just 2% overlap existing between what is within MPAs now and what may need to be safeguarded in the future.

It is clear that significant new scaled-up action is needed to conserve Mediterranean marine biodiversity though an MPA network. Taking concerted action to move from the current fragmented Mediterranean MPA network to deliver a proper network will help address all three of shortcomings identified in 2006 and address the gap analysis from 2012. This will thus help significantly assist with meeting existing international, regional and national commitments and delivering benefits across the region.

Action is already ongoing to improve the situation reported on above in the 2008 analysis. In recent years considerable strides have been taken in the Mediterranean, but many challenges remain in moving towards and building the MPA network. These challenges stem from a range of issues but predominantly focus around:

- Differing levels of progress by individual countries on MPAs;
- Differing levels of commitment by governments;
- Differing levels of resources available;
- Differing levels of technical in-country MPA capacity available
- Different languages;
- Different levels of understanding of marine resource distribution and features;
- Differing socio-economic contexts and policies;
- Differing scales and types of impacts on biodiversity across the region; and
- Different parts of the conservation community working on different parts and perspectives of the overall MPA challenge.

By developing this MPA network guidance an opportunity is created for countries and agencies in the region to build and share a common vision, a common language, and a common and consistent approach on the need for and building blocks to put in place an effectively and equitably managed, ecologically representative and well connected system of marine protected areas. Such a common approach should cover all main aspects from the establishment of the network through to its management and reporting.

This guidance should accordingly make a significant contribution to many initiatives including the 'common vision' which has been developed for the Mediterranean with MPA partners (RAC/SPA being one of the co-organizer with MedPAN Association) and presented at The Forum of MPAs, held in Turkey in November 2012.



4. STRUCTURING OF THE MPA NETWORK GUIDANCE AND MAJOR WORKING ASSUMPTIONS

Taking the differing circumstances of counties and agencies across in the Mediterranean into account, this MPA network guidance is built around the overall premise that the starting point for different countries in the region will be different, and markedly different in some cases. Not only have countries got different starting positions but so do individual MPA and broader spatial management programmes and projects that are already underway. Sometimes these are seen as working in isolation from each other on MPAs, but they can all usefully contribute towards developing the MPA network if a common agenda is evident on which to build all efforts. Often what is missing is a common approach to see how the various contributions could better fit together. All these issues make the provision of clear and simple advice on how to bring such efforts together to build a successful MPA network all the more important and urgent.

In order to set out a simple strategic framework to support the development of SPAs and the growth of the MPA network a number of broad assumptions have had to be made in generating this guidance. These assumptions, which shape the context and nature of the advice offered, which are reflected to varying degrees within it, and which reaffirm some decisions already taken in the region, are:

• That whilst this guidance has been commissioned to directly focus on SPAs declared by countries to the Barcelona Convention and the SPAMIs, there is a necessity to ensure that it can, and should, equally apply to other types and systems of MPAs that exist in the Mediterranean. The benefits and conclusion are obvious – that in meeting the CBD target an effective MPA network in the region should have at its core SPAs and SPAMIs, but that it will very rapidly need to bring in all other relevant types of MPAs. This is if significant important biodiversity currently lying outside existing MPAs is to be brought into the network, and if as a result the revised CBD target has any hope of being met in a full and timely fashion, even on the revised timetable of 2020. One set of network guidance as contained in this document should shape the MPA network approach for the entire region to ensure maximum focus and coherence of efforts across the Mediterranean.

MPA network guidance recommendation 1: that, a single approach is developed at the Mediterranean scale through which to develop the MPA network targeted at delivering the CBD target 11. An initial focus may be on SPAs, but other types of MPAs will need to be drawn into the process to meet the 2020 target.

• That to be successful any action on MPA networks must sit within a wider suite of management measures such as marine spatial planning and ICZM, etc. Many of these wider measures already exist in some form driven by policy and legislation e.g. Marine Strategy Framework Directive, ICZM Protocol, and the European Neighbourhood Policy. For this integration to be successful there must be an adopted political, economic and financial view of MPAs in this context. This is critical not just to ensure coherent meaningful actions but also as the threats to MPAs often rest outside their boundaries and in the jurisdiction of other authorities or nations. This guidance recognises the essential need for this to happen but does not identify how or through whom this should occur.

MPA network guidance recommendation 2: that, in agreeing how to implement the MPA network, concrete agreements are simultaneously reached on the role of MPAs in broader spatial management, and routes are secured through broader management to secure the conservation values of MPAs when threats originate from outside site boundaries in the wider surrounding marine environment.

• That consideration of, and working with, varying legal jurisdictions for the Mediterranean Sea, is not only highly relevant to building MPA networks, but is something that needs to be tackled as part of taking forward this guidance. Governance of Mediterranean waters is in a state of flux so the network guidance and principles contained herein should apply irrespective of the extent or otherwise of national controls over the sea. This is of particular relevance as the CBD target applies irrespective of who is responsible for the ocean. This guidance accordingly set out 'what' needs to be done and recommends a systematic process to achieve this – any subsequent implementation process through relevant authorities then needs to decide 'who' is best placed to make this happen, with different approaches and actors being valid in national waters and in areas currently regarded as beyond national jurisdiction.

MPA network guidance recommendation 3: that, in creating the framework for the MPA network, agreement is reached on legislative and policy roles across the Mediterranean to ensure that the varying responsibilities are recognised and aligned so as to secure implementation of the CBD target.

• That implementation of this network guidance will be needed to develop the required supporting technical advice and to reform policies, processes and procedures at various levels (for example at the country level and Convention level) in order to realise the full potential of the MPA work underway. This will also ensure that maximum opportunity is taken to create the network, ensuring for example that the creation of sites such as SPAs and SPAMIs (Fig. 5) in the future is directly linked to the necessity to contribute to and build the MPA network in a considered and structured manner. This guidance set out a practical framework, but there will be gaps in practice that need to be closed if the advice given here can come into proper effect. Difficult decisions will need to be taken as to whether the existing framework of sites, such as the SPAMI network, should be transformed into the MPA network, or whether it is simpler in the long run to create the MPA network de novo with SPAs at the core and incorporate sites into such a comprehensively planned framework ensuring MPA network design principles are met in full. It is probable that a high likelihood of success can be generated if a commonly held understanding is reached on how the existing juridical instruments and processes for MPAs (and their articulation) at the regional (& European) level can come together in a harmonised manner to create a single MPA network for the Mediterranean.

MPA network guidance recommendation 4: that, in creating the framework for the MPA network, evolution as well as harmonisation of current practices will be needed, with essential gaps in policy and practice being filled.

• That inclusion of stakeholders to the process is handled through existing or to be planned opportunities, processes and procedures. It is impossible at this level of guidance to specify how this occurs now, or can be applied in the future, other to say that the overall success of network implementation is due to a large degree on support and self-compliance by many stakeholder groups who must be involved at all stages (see best practice table, page 24).

MPA network guidance recommendation 5: existing national, regional and initiative-led stakeholder engagement will need to be matched to the task of building the MPA network with new processes developed as needed to ensure involvement and support for the overall objectives and outcomes being sought.

Set against these general assumptions, this guidance introduces a process of systematic conservation planning, providing a simple step-wise basis to build up a common understanding of the need for such a network, its values, what key definitions mean, how a step-wise development can be achieved with different regions moving at different paces, and how countries and agencies can plot their own progress against this advice using a self-assessment checklist approach.

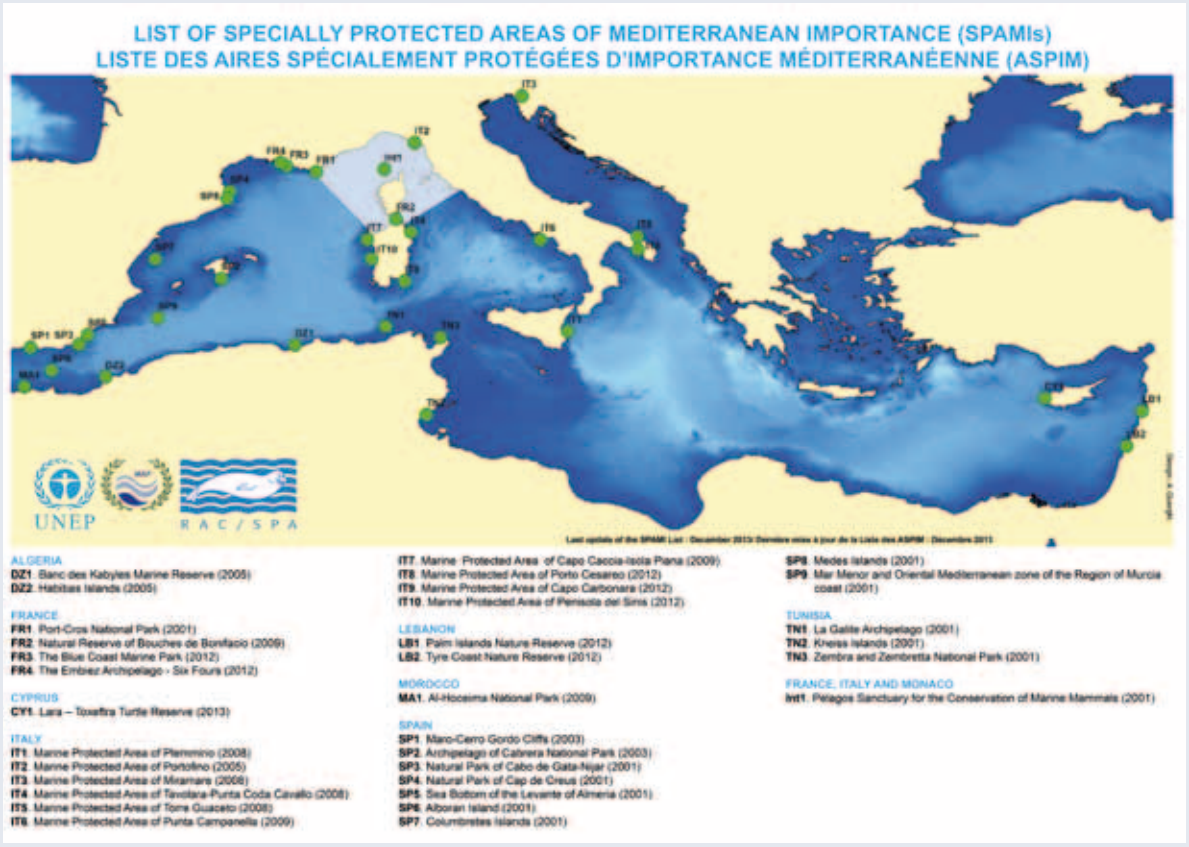


Figure 5. SPAMI network in the Mediterranean Sea could contribute to MPA network building in a considered and structured manner.

5. MPA NETWORK BASICS: DEFINITIONS, SYSTEMATIC CONSERVATION PLANNING, AND SOME KEY PRE-CONDITIONS FOR GENERATING SUCCESS

To develop a common vision for the MPA network with a current focus on SPAs means sharing a common understanding across the Mediterranean on the underlying building blocks for the network. Whilst this guidance is focussed on SPAs it is important for the greater utility of this guidance to develop such a broader understanding to enable all elements to come together at some point in the future to deliver the CBD MPA target 11. Two definitions are particularly important in guiding discussions and actions: what is an MPA and what is an MPA network?

It may seem strange to focus on the MPA definition but without a clear understanding of 'what counts' towards the network, different people will have different views that will hamper creating a shared clear vision and common process. There are several definitions of an MPA but the one used in this guidance is the current official one from IUCN adopted in 2008 (Dudley, 2008), which applies equally to protected areas on land and in the sea:

A clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values.

This definition builds on and replaces an earlier IUCN definition specifically focussed on MPAs that provides additional helpful context (Kelleher & Kenchington 1992, IUCN 1994):

Any area of intertidal or subtidal terrain, together with its overlying water and associated flora, fauna, historical and cultural features, which has been reserved by law or other effective means to protect part or all of the enclosed environment.

The CBD definition for an MPA is very similar (Decision VII/5, paragraph 10):

Any defined area within or adjacent to the marine environment, together with its overlying waters and associated flora, fauna, and historical and cultural features, which has been reserved by legislation or other effective means, including custom, and with the effect that its marine and/or coastal biodiversity enjoys a higher level of protection than its surroundings.

MPA network guidance recommendation 6: That, in evolving SPA work, and in thinking about a Mediterranean-wide MPA network, the IUCN definition of an MPA is adopted to lie at the heart of a common language for the region.

Perhaps one of the commonest issues surrounding such definitions is when can a fisheries management area also be referred to as an MPA. Similar issues also revolve around the inclusion or otherwise of military and offshore wind energy areas as MPAs. IUCN have launched new guidance on this in September 2012 at the World Conservation Congress as part of the supplementary guidelines on the IUCN Categories system. In summary a fisheries management area, for example, can qualify as an MPA under the above definitions if it has a specific principal objective for the long term conservation of nature, in isolation or alongside other objectives. Indeed fisheries issues and aquaculture are recognised under category VI of the management system. Thus fisheries measures that lower the take of fish for an area on the basis of exploitation alone do not qualify. Whilst only some fisheries areas may therefore form part of the MPA network, fisheries management more broadly is however very relevant to achieving the CBD target given its significant role in regulating effort and impacts across the wider marine environment beyond MPA site boundaries.

Alongside understanding MPAs it is also important to have a shared view on definition of MPA network. IUCN's World Commission on Protected Areas (Laffoley *et al*., 2008) defines it as follows:

An MPA network is a collection of individual MPAs operating cooperatively and synergistically, at various spatial scales, and with a range of protection levels that are designed to meet objectives that a single reserve cannot achieve.

MPA network guidance recommendation 7: a common definition for the MPA network is adopted to structure MPA work and the ultimate achievement of the CBD MPA target.

As science and experience continues to provide more evidence of the importance of biological connectivity and resilience in the face of climate change, natural disasters and economic, political and social fluxes, it is becoming more evident that networks of MPAs are increasingly valuable management tools.

An MPA network can contribute to sustainable development goals by fostering integrated ocean and coastal management through four inter-related functions and benefits:

- Ecological – a network can help maintain functional marine ecosystems by encompassing the temporal and spatial scales of ecological systems;
- Social – a network can help resolve and manage conflicts in the use of natural resources;
- Economical – a network can facilitate the efficient use of resources; and
- Political - supporting a network of sites is more efficient, resilient and sustainable (e.g. in terms of budget, staff, fulfilment of international commitments, access to international funding etc.).

To achieve this MPA network should protect flora and fauna that are rare, threatened or representative of Mediterranean Sea biodiversity in order to conserve a diverse ecosystem and improve resilience to human activity. In other regions MPA networks are also being used to conserve features of geological, geomorphological and hydrological interest. Many species have intimate links to hydrology, geology and geomorphology – caves for monk seals, deep water canyons for whales, vents for a number of organisms, seamounts as oasis sustaining marine species etc. In line with the CBD target and the definition of MPA network given above, such a network can only maximise its benefits if it is set and managed sympathetically with a wider framework of measures aimed at protecting and sustainably managing the sea.

Moving from individual MPAs or groups of MPAs to deliver an MPA network is best achieved through a structured planning process with clear steps and processes. This is different to the design principles that are used to shape the MPAs within the network that are considered in section 6 (page 15).

MPA network guidance recommendation 8: that, the MPA network should incorporate hydrological, geological and geomorphological interest, with biodiversity conservation at its core.

A structured planning process allows for efficient use of resources, effective joint and regional working, and the delivery of a clear process for all players and stakeholders to engage with. This type of approach, where the MPA is planned and considered within the broader context, is also known as an example of 'systematic conservation planning', and when implemented effectively this is seen to support delivery of the ecosystem approach.

Systematic conservation planning has at its heart six stages for delivering effective outcomes alongside fostering and growing strong community engagement, with precise details varying according to circumstance (Margules and Pressey, 2000):

- Compile data on the biodiversity of the planning region;
- Identify conservation goals for the planning region;
- Review existing conservation areas;
- Select additional conservation areas;
- Implement conservation actions; and
- Maintain the required values of conservation areas.

MPA network guidance recommendation 9: that, a systematic conservation planning approach is taken in developing an MPA network and further progressing of work on SPAs.



Posidonia oceanica meadow is recognised to be one of the world's best carbon sinks (© RAC/SPA, Gérard Pergent)

The main stages and important considerations involved with systematic conservation planning (reproduced from Margules and Pressey, 2000).

Systematic conservation planning can be separated into six stages, and some examples of tasks and decisions in each are presented below. Note that the process is not unidirectional; there will be many feedbacks and reasons for altering decisions. Whilst the text below is focussed on terrestrial examples the principles of the approach still hold for marine environments.

1. Compile data on the biodiversity of the planning region

- Review existing data and decide on which data sets are sufficiently consistent to serve as surrogates for biodiversity across the planning region. If time allows, collect new data to augment or replace some existing data sets.
- Collect information on the localities of species considered to be rare and/or threatened in the region (these are likely to be missed or under-represented in conservation areas selected only on the basis of land classes such as vegetation types).

2. Identify conservation goals for the planning region

- Set quantitative conservation targets for species, vegetation types or other features (for example, at least three occurrences of each species,1,500 ha of each vegetation type, or specific targets tailored to the conservation needs of individual features).
- Despite inevitable subjectivity in their formulation, the value of such goals is their explicitness.
- Set quantitative targets for minimum size, connectivity or other design criteria.
- Identify qualitative targets or preferences (for example, as far as possible, new conservation areas should have minimal previous disturbance from grazing or logging).

3. Review existing conservation areas

- Measure the extent to which quantitative targets for representation and design have been achieved by existing conservation areas.
- Identify the imminence of threat to under-represented features such as species or vegetation types, and the threats posed to areas that will be important in securing satisfactory design targets.

4. Select additional conservation areas

- Regard established conservation areas as 'constraints' or focal points for the design of an expanded system.
- Identify preliminary sets of new conservation areas for consideration as additions to established areas. Options for doing this include reserve selection algorithms or decision-support software to allow stakeholders to design expanded systems that achieve regional conservation goals subject to constraints such as existing reserves, acquisition budgets, or limits on feasible opportunity costs for other land uses.

5. Implement conservation actions

- Decide on the most appropriate or feasible form of management to be applied to individual areas (some management approaches will be fallbacks from the preferred option).
- If one or more selected areas prove to be unexpectedly degraded or difficult to protect, return to stage 4 and look for alternatives.
- Decide on the relative timing of conservation management when resources are insufficient to implement the whole system in the short term (usually).

6. Maintain the required values of conservation areas

- Set conservation goals at the level of individual conservation areas (for example, maintain seral habitats for one or more species for which the area is important). Ideally, these goals will acknowledge the particular values of the area in the context of the whole system.
- Implement management actions and zonings in and around each area to achieve the goals.
- Monitor key indicators that will reflect the success of management actions or zonings in achieving goals. Modify management as required.

This guidance follows this approach in providing guidance for a strategic framework for building the MPA network and delivering improvements in the SPA network and connectivity between individual sites. An important aspect to note is the emphasis on planned effective outcomes. Thus the initial thinking of some that meeting the requirements to build MPA networks is simply a process of selecting sites that meet certain criteria is to ignore the essential human dimension in delivering effective management and effective community engagement, outreach and education. Without a doubt the local context and involving the local communities to the greatest degree possible are fundamental to the success of establishing the MPA network. This aspect is considered further in section 12 (page 27).

Eight key best practice points from the cumulative experience of the Great Barrier Reef Marine Park Authority.

- A good process is critical to achieving outcomes Objectives & operational principles need to be established upfront;
- Process needs to be anchored in best available science The process needs to be transparent & invite participation;
- Don't wait for certainty of science – it is unlikely to be gained;
- General principles + imperfect knowledge ~ good outcomes;
- In light of the above, management arrangements need to be practical and timely; and
- Effective research, monitoring & reporting programs prioritised to provide information for management are critical.

Pers. comm. 2012. GBRMPA team (Josh Gibson, Darren Cameron, Jon Day, Kirstin Dobbs, Laurence McCook, Randall Owens, Mark Read, David Wachenfeld).

6. NETWORK DESIGN PRINCIPLES AND KEY STEPS TOWARDS DELIVERING THE MPA NETWORK

In taking forward the CBD target, in meeting the aims of an overall MPA network and in improving the SPA sites, seven network design principles need to be considered. They form the core of thinking on building MPA networks and information set out here draws strongly from the latest definitive guidance on MPAs issued by Natural England and the Joint Nature Conservation Committee (2010) that in turn draw on guidance agreed by the OSPAR Commission (OSPAR 2006) and international best practices (Laffoley *et al* 2008), all of which the author of this report had some role in developing or offering advice on.

Adoption of these principles not only ensures that any Mediterranean MPA network is well-founded but also that it has a common consistency with very significant work already underway elsewhere in Europe, particularly in more northern and Atlantic waters. The seven network design principles are:

- Representativity – the MPA network should represent the range of marine habitats and species by protecting all major habitat types and associated biological communities present in the Mediterranean Sea, including unique habitat types;

- Replication – all major habitats should be replicated and distributed throughout the network. The amount of replication will depend on the extent and distribution of features within the Mediterranean Sea;

- Viability – the MPA network should incorporate self-sustaining, geographically dispersed component sites of sufficient size to ensure species and habitats persistence through natural cycles of variation;

- Adequacy – the MPA network should be of adequate size to deliver its ecological objectives and ensure the ecological viability and integrity of populations, species and communities (the proportion of each feature included within the MPA network should be sufficient to enable its long-term protection and/or recovery);

- Connectivity – the MPA network should seek to maximise and enhance linkages amongst individual MPAs using best current science. For certain species this will mean that sites should be distributed in a manner to ensure protection at different stages in their life cycle;

- Protection – the MPA network is likely to include a range of protection levels. Ranging from highly protected sites or parts of sites where no extractive, depositional or other damaging activities are allowed, to areas with only minimal restrictions on activities that are needed to protect the features; and

- Best available evidence – network design should be based on the best information currently available. Lack of full scientific certainty should not be a reason for postponing proportionate decisions on site selection.

MPA network guidance recommendation 10: that, further work on SPAs and on developing the MPA network uses all seven network design principles, if they are not all already central to design processes.

A key outcome sought from properly applying these seven criteria is the concept of resilience. Resilience is the ability of an ecosystem to absorb, resist or recover from disturbances and damage cause by natural perturbations and human impacts. Given the rapidly changing climatic conditions in the Mediterranean Sea, coupled with significant impacts that vary across the area in terms of intensity, cause and extent, using the MPA network to stimulate increased resilience is a very valuable goal to pursue with widespread associated benefits.

Resilience is dependent on effective application of the network design principles as it is related to the degree of replication of representative habitats in the network, the connectivity achieved between MPAs, ensuring that sites are of a viable size and delivering sufficient effective and capable protection for habitats and species within the network, with full protection of some areas, to restore and/or maintain ecological functioning and associated ecosystem complexity. Resilience can be enhanced as the consequences of the arrangement of MPAs and their associated management spreads the risk of disturbance by having sufficient examples of ecosystems in a good condition to stimulate recovery. This is reinforced by the fact that at such network scale protection of the underlying genetic diversity and biological variation is better achieved.

MPA network guidance recommendation 11: that, further work on SPAs and on developing the MPA network should be funded and undertaken in such a way as to promote the delivery of increased resilience.

Alongside network principles and the concept of resilience are two other important sets of considerations that help assist the identification of MPA sites for the network. As such they are highly relevant when thinking about SPAs and types of MPAs that exist and need to be drawn into the Mediterranean MPA network, or new ones that need designating. These two areas relate to ecological and practical considerations.
Key ecological considerations that guide choice of future MPA sites to build the network relate to (Natural England and the Joint Nature Conservation Committee, 2010):

- Presence of rare, declining, endemic or threatened species;
- Presence of habitats and species of conservation importance;
- Ecological significance of features (species, habitats, ecosystems and associated processes) being proposed;
- High natural biological diversity;
- Sensitivity of features;
- Naturalness of features ; and
- Size and positioning of the MPA.

The practical considerations that often also come into play, especially where there is a choice on location to contribute to the MPA network, are:

- Synergies with other sectors;
- Size;
- Potential for recovery;
- Degree of consensus;
- Potential for success of management measures;
- Scientific value; and
- Degree of threat.

The question then arises as to how use this information to improve the existing SPA network and connectivity between sites? It should be evident from the above that to be able to assess existing SPAs within the context of network thinking, particularly concerning representativity, replication and connectivity, a number of fundamental elements to be in place, some of which are more developed than others in the Mediterranean context. Other components may be needed, such as the inclusion of stakeholders in appropriate ways, but how this occurs will be dependent on situation and circumstance.

In particular taking a view on the value and contribution of existing SPA sites, and the scale and complexity of the Mediterranean Sea, will generally require the following components to be in place:

- Defined eco-regions (Fig. 6). Whilst the overall unit is the Mediterranean Sea, a common and agreed understanding of ecological regionalisation is needed, identifying the regional sea scale units that can be used as a practical scale to bring together agencies and stakeholders to build the MPA network. The use of eco-regions becomes particularly significant and important when applying the network design principles. This is because eco-regions are convenient units within which to set targets for, for example, representativity and replication. Critically they provide the framework against which to track percentage targets under the CBD. Other approaches exist, such as in Scotland where the development of the network is being overseen centrally, but for the Mediterranean with diverse cultures, languages and settings, eco-regions seem the most appropriate approach that have already been successfully employed on previous occasions.

MPA network guidance recommendation 12: that, the existing general definition of Mediterranean eco-regions is used for the purpose of the development of the MPA network and agreed as the basic planning regions through which to analyse current sites and assess the need and location of further sites to progress work on SPAs and build the MPA network.

• Agreed MPA network objectives. A shared understanding of the marine biodiversity priorities for Mediterranean Sea is needed, and how these divide down at the regional sea scale. This would be by bringing together listings from the different Directives, Conventions and Agreements into one list, assessing whether what is listed matches with actual conservation needs, and then setting the outcome in terms of objectives to be delivered by the MPA network. This is an important process to go through as knowledge that influences priorities and actions emerges all the time that influences choices in developing the network, such as extent to be included of particular habitats and levels of protection needed. A good case in point is seagrass Posidonia which is now recognised to be one of the world's best carbon sinks per unit area, often containing many meters of pure carbon laid down over several thousand years within the seabed under the living surface of plants. The network objectives should be for the network as a whole, and not simply a reflection of objectives for a single Convention or Directive that often have a perfectly reasonable perspective linked to their establishing needs, but not one that often reflects the implementation of the comprehensive MPA vision needed.

MPA network guidance recommendation 13: that, objectives are agreed for the MPA network as a whole, so that SPA work can be set in context, critical gaps identified, and the contribution of other types of MPAs fully recognised.

• Basic ecological knowledge of marine ecosystem distribution. A knowledge on the broad distribution of all habitats and relevant species, to act as a commonly held backdrop to discussions on the contribution existing SPAs and other MPA types already provide, and as essential context to identify where gaps in protection of which habitats occur.

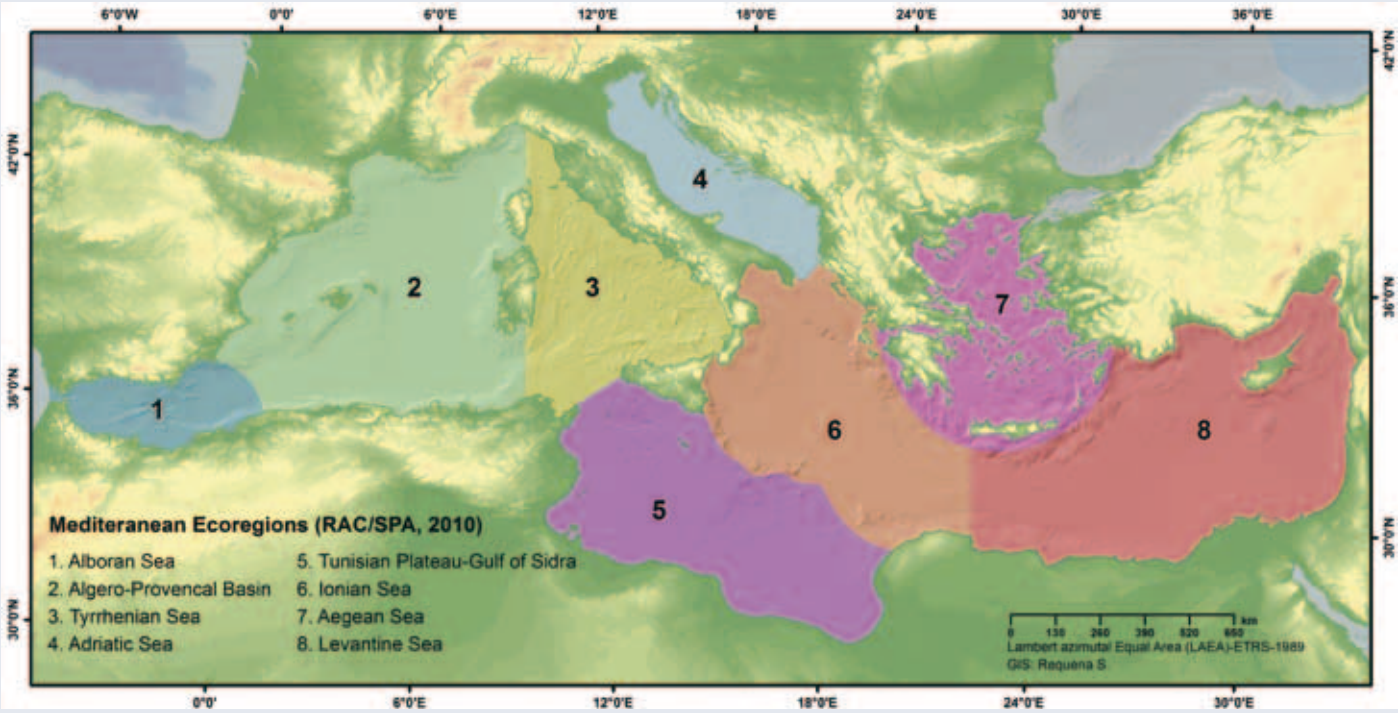


Figure 6. The ecoregions according to Nortarbartolo di Sciara and Agardy (RAC/SPA, 2010)

Examples of broadscale habitat mapping are given below (Fig. 7).

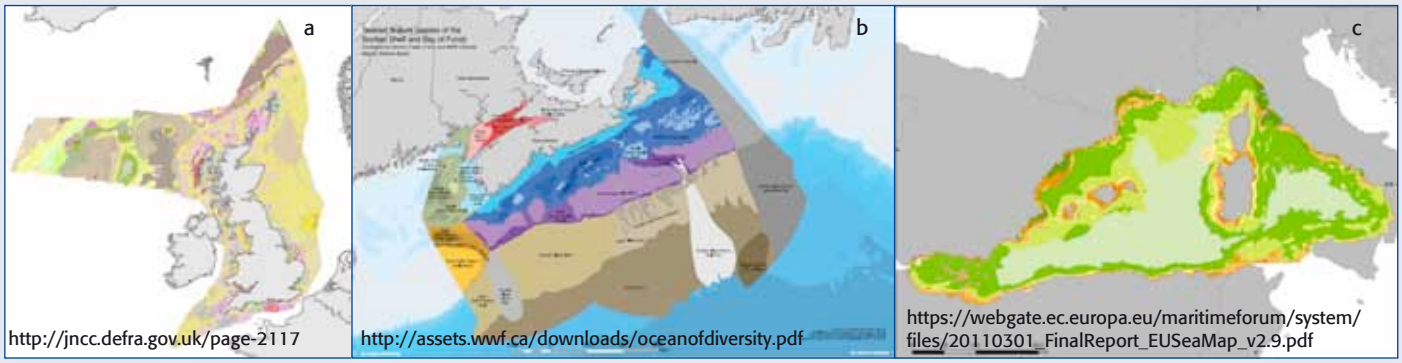


Figure 7. Examples of broadscale habitat mapping (a: the UK, b: Nova Scotia, Canada, and c: the western Mediterranean)

MPA network guidance recommendation 14: broadscale habitat mapping is agreed, developed and the resultant maps and information made widely available as an essential backdrop to the systematic conservation planning needed, and lying behind further SPA work and network development.

- Agreed list of features of conservation importance. Existing initiatives focus on different aspects of conservation priorities for the Mediterranean. In developing a common view and in order to set objectives and priorities for the network as a whole such different priorities for protection of habitats and species should be brought together into a unified list. This list should identify links to existing legislation or policy instruments as well as particularly important eco-regions for the habitat or species concerned. This then provides a key element of the framework through which to apply systematic conservation planning using eco-regions, to match to the benefits of exiting SPAs, and to identify new MPAs to add to the network.

MPA network guidance recommendation 15: compile a single unified list of features of particular conservation interest for the Mediterranean to both inform and drive systematic conservation planning and the setting of conservation targets for the network to achieve.

Given the multiplicity of existing issues and approaches that need to be considered in implementing this network guidance it is often helpful to organise information and expertise in particular ways:

- Developing and providing 'ecological MPA network guidance' as a central source of advice to drive the network development process. Clearly shifting from isolated or groups of existing SPAs or MPAs to the MPA network involves generating advice on a wide range of issues, processes and actions that will be needed. In order to provide clear, consistent and widely shared and commonly owned advice, setting out such information in the form of network guidance is seen as valuable thing to. This guidance should provide essential information about how to meet each of the network design criteria. It is also important as it can describe the road map, provide transparency for the various stages, and by its publication ensure the community has access to such core advice.

Providing this advice is particularly important for MPA initiatives covering a large geographical area with differing starting points, considerations and issues, such as the Mediterranean. This is to ensure that the multitude of differing MPA initiatives do converge at some stage into a coherent process and biodiversity platform that supports network implementation.

MPA network guidance recommendation 16: bring together information in the form of 'ecological network guidance'.

• Establishing and appointing an independent science advisory group to support their MPA process. A trend is implementing ecological network guidance is to form an independent science advisory group that bring together leading expertise needed to offer practical scientific advice on the process. Such experts assist by being seen to be independent to the responsible agency (or agencies), providing technical advice and answering key questions raised, and in so doing adding significant credibility to the process. A key role they can play is to evaluate proposal for the MPA network against the guidelines, providing essential perspectives on whether what is being put forward is appropriate and whether it forms an ecologically coherent MPA network.

MPA network guidance recommendation 17: consider establishing an independent MPA network science advisory group to help shape future processes, to ensure an independent voice, and to add credibility to the process.

Conceptually the way all this is brought together and used to assess the contribution of existing MPAs, in this instance SPAs, and determine the actions needed to progress towards delivering the MPA network is set out in figures 8 and 9. These are derived and modified from the guidance issued by Natural England and the Joint Nature Conservation Committee, 2010. Figure 8 sets out the basic process and Figure 9 looks in more detail at some of the considerations needed to determine the best location of any new sites needed to complete the MPA network. Such considerations will be similar when thinking about strengthening the existing SPAs and starting the development of an MPA network.

What is evident from figures 8 and 9 is that a nested process for development of an MPA network across a large geographical area is needed where distinct eco-regions exist and/or a complexity of socio-economic settings occur. Thus whilst the iterative planning process is required at the eco-regional scale to determine the best location for any new sites to grow and complete the network, an overall process across all regions is then needed to finalise the network as a whole and ensure that every site is appropriate, makes a good contribution and that the sites taken together will deliver an effectively and equitably managed, ecologically representative and well connected MPA network.

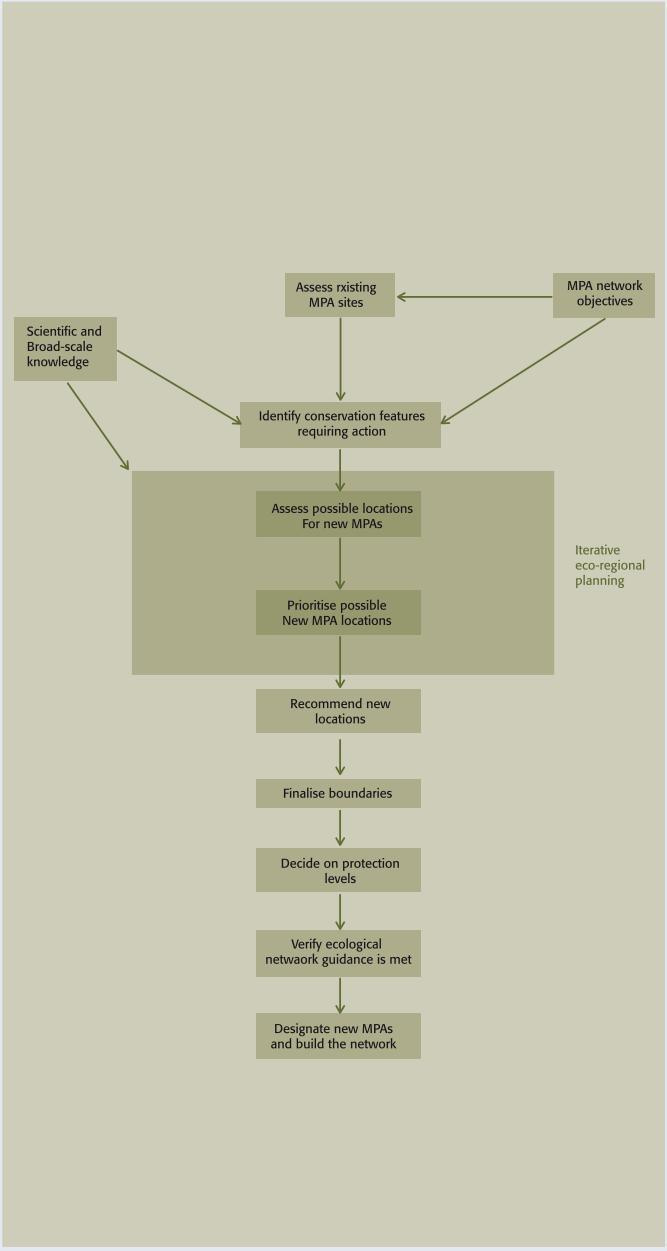


Figure 8. The recommended systematic approach, which will enable a view to be taken on building the SPA network – this common approach can be used to integrate other MPA types into a single framework to implement the CBD MPA target. The shaded section in the above picture on iterative eco-regional planning is considered in more detail in figure 9, which explores key considerations that need to be made in identifying the possible location of new MPAs (modified from Natural England and the Joint Nature Conservation Committee 2010).

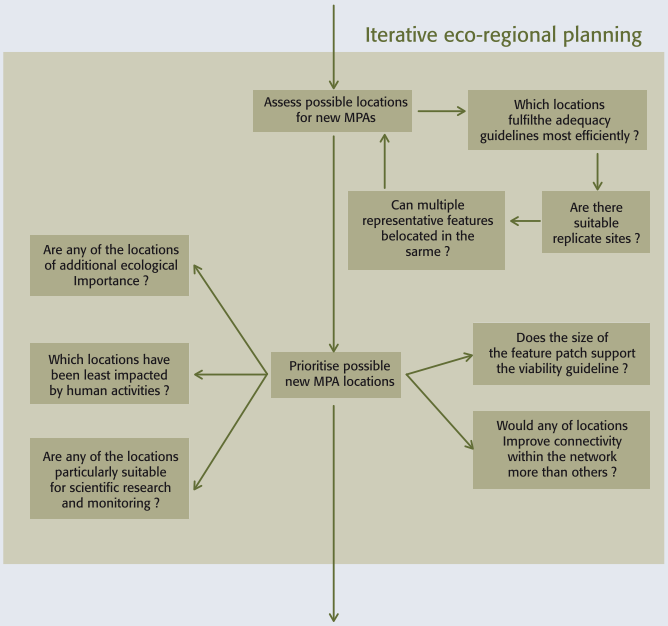


Figure 9. Expanded section of figure 8 to highlight major considerations that are needed in improving an MPA network to identify possible new MPAs to build the network. The considerations set out above apply equally to any MPA as well as SPAs (modified from Natural England and the Joint Nature Conservation Committee 2010).

7. LEVELS OF PROTECTION NEEDED TO SECURE THE MPA NETWORK

The level of protection afforded to individual constituent sites within the MPA network is a key design consideration and a question that will be raised in relation to SPAs (it is one of the seven network design principles). Widespread consultation associated with establishing a network inevitably raises significant questions on what activities will be allowed, and importantly for stakeholder which activities are there proposals to prevent.

A basic premise is that if the network design principles have been applied well the level of management should be commensurate with sustaining the key conservation values for the long term. Thus this requires an understanding of the sensitivities and resilience of broadscale habitat types and features of particular conservation interest in applying the design principles. This can be best supported by a desk study bringing together such information against which means it is then possible to come to views on the general compatibility or otherwise of activities.

MPA network guidance recommendation 18: undertake a desktop study (if not already done) to assess the differing vulnerabilities and resiliences of broadscale habitat types and features of particular conservation interest.

In many MPA networks, alongside such broadscale considerations, plans include scaling up of protection levels or the inclusion of reference areas. Both approaches are in response to the often documented deterioration in ecosystem condition in recent decades, coupled with a view that a successful MPA network should not just sustain current conservation values but act as a tool to support recovery. Indeed reference areas, where all extractive uses are prohibited, are possibly the only way in which governments may find out the full potential of the seas to better support economic needs and possibly the only way they can benchmark delivery of sustainable development.

MPA network guidance recommendation 19: agree on the need for absolute protection of individual sites based on the ecological requirements of habitats and species, and also on the need to scale up strict protection commensurate with deterioration of the Mediterranean Sea in recent decades, and the need to establish reference areas throughout the MPA network to benchmark recovery and sustainable development.

The key principles of scaling up protection levels or include reference areas draw from network design principles, in that good practice dictates that any such areas should be representative of the habitats and species in the network, replicated in eco-regions, and distributed across the network as a whole. In some circumstances species of particular conservation value may be so rare or threatened that a greater proportion or indeed all of their examples should be strictly protected. This will certainly be case with some endemic species with limited distributions.

8. REPRESENTATIVITY AND REPLICATION OF ECOLOGICAL FEATURES AT THE APPROPRIATE SCALE

Representativity is another key design principle in adding new SPAs and building the MPA network. It is the word used to describe the need for the MPA network to protect examples of the full range of marine biodiversity found in the region. In practice, this is usually achieved by grouping habitats and species together into broad-scale habitat types and ensuring that examples of all such broad-scale types are included across the MPA network (see figure 7 for broad scale habitat mapping).

Representativity also includes ensuring that in protecting the full range of biodiversity attention is given to rare, threatened, declining and endemic species with limited distributions. Where there is a choice between similar sites it may be the presence of such features of conservation interest that determines the eventual choice of location to be included in the network.

Guidelines can be developed setting out targets for the number of broad-scale habitats types that must be represented through sites in the network, and therefore in each eco-region. The number to be represented in the network is the total number of broad-scale habitats present in the region. The use of such surrogate rather than detailed information on every habitat type allows the planning process to proceed even if only limited information is available (see key best practices table 1, page 24). It is important though that surveys also occur to ground-truth any computer-generated broadscale maps (usually utilising existing seabed data underlying navigation charts) to confirm the presence of the habitat types, especially in any areas that may be proposed as sites for the network.

Similarly targets can be developed for other aspects such as species where MPAs can be shown to make a valuable contribution to conservation status. By taking a targeted approach there is then a numerical basis to determine if the network is delivering protection for the full range of biodiversity in the area.

Replication is the protection of the same feature across multiple sites within the network, taking biogoegraphical variation into account. To fulfil this network design principle, all features should be replicated across the network with individual examples being spatially separate. Replication is very important for the MPA network as it spreads the risk of damaging events and long-term change negatively affecting the features of the MPA. Distributing examples across the network protects against otherwise individual examples being wiped out by local events, and thus acts as a form of 'insurance' against future loss. Again successful application of this principle requires up-front knowledge of the broadscale distribution of habitats and features of conservation interest across the whole region.

The number of replicates of a feature is a matter of choice but as with representativity numerical targets will need to be set to determine if the eventual MPA network is meeting its original objectives. The number of replicates recommended in the literature varies, with three to five often recommended within a selection area (Laffoley *et al*., 2008). Others recommend that more than one example is included in each biogeographical region with no upper limit suggested (Joint Nature Conservation Committee 1998).

MPA network guidance recommendation 20: targets are developed for representativity for the MPA network, to guide the future development of SPA work, based on the scale of the eco-region and the desired frequency of occurrence of broadscale habitat types and features of conservation interest within it.

Recent MPA network guidance from Natural England and the Joint Nature Conservation Committee (2010) concluded that at least two separate examples of broadscale habitats should be protected in each of their regional projects, with each area also protecting three to five examples of features of conservation importance, containing rare, declining and threatened species, where their distribution allows for this. Any existing sites will clearly contribute to replication so the actual number of new sites needed to fulfil this guideline may be lower than initial targets set.

In practical terms the number of replicates lies within and around these ranges identified above and needs to be determined as part of the development of specific ecological network guidance for the Mediterranean. The relative size of the eco-regions used in the Mediterranean in any iterative planning process, and the diversity of broadscale habitats and features of conservation interest, will clearly have a bearing on replicate numbers. The overall principle must be that relication must be valid and meaningful at the regional level, at the sub regional level, at the eco-region level if necessary, and even at the national level.

9. CONNECTIVITY AND ECOLOGICAL COHERENCE – DETERMINING THE SPACING OF MPAS IN THE NETWORK

Connectivity is the extent to which populations in different parts of a species' range are linked by the movement of eggs, larvae or other propagules, juveniles or adults. Connectivity between habitats is one of the key principles of ecological coherence and seeking to maximise connectivity between MPAs may be critical for effective conservation and for the persistence of features within the network. In addition to linkages through reproduction, connectivity may also occur as a result of movement of adults or young between MPAs, the regular settlement of larvae from one MPA to another, or through underlying physiochemical processes such as the transfer of nutrients.

Delivering connectivity in an MPA network is not an exact science as adults and larvae will pass in and out of MPA boundaries and may be subject to periodic changes in current regimes. However some predictability in linkages can be achieved through the persistence of current systems and also from knowledge of the dispersal distances of species of conservation interest.

Natural England and the Joint Nature Conservation Committee (2010) advise that in the absence of species specific information on connectivity, MPAs of a similar broad-scale habitat types should be separate, where possible, by no more than 40 – 80 km (between individual MPA boundaries). It is also possible to approximate connectivity by ensuring that MPAs are well distributed across the eco-regions underlying the development of the MPA network.
Studies have been undertaken in several regions to look in more detail at MPA spacing by analysing details of planktonic life stages of marine species. Coupled with modelling of currents and tides this gives an ability to predict how far larvae may drift before settling out of the water column. Roberts *et al*. (2010) suggest that species that spend a month or more in the plankton may disperse a few tens of kilometres per generation. Species with short larval stages and that spend little time in the plankton can be protected within an MPA in the network provided it is of a viable size. Some species that have close relationships with a particular habitat may be further restricted in their dispersal ability.

MPA network guidance recommendation 21: targets for MPA spacing are adopted as part of ecological network guidance for SPAs and the MPA network, using best practice of no more than 40 to 80 km where possible between component MPAs.

Where prevailing currents operate particular MPAs may act as a source supplying downstream MPAs. In terms of applying the network design criteria to develop the MPA network connectivity is an important consideration but secondary compared to ensuring for example representativity and replication of all habitats and features of conservation concern, and the viability and adequacy of component MPAs.

10. ASSESSING PROGRESS IN DELIVERING THE MPA NETWORK

A key question is how do you know when the MPA network as set out in the CBD target has been achieved? Systematic conservation planning shows the role that the delivery of end-point conservation should play in the process. Thus simply applying the network guidance principles will not in themselves result in the CBD MPA target being achieved. Political leadership, effective management, surveillance and monitoring and many other aspects all form important parts of delivering success.
In view of this question and these issues a self-assessment checklist has been developed to help track progress towards delivering MPA networks (Day and Laffoley, 2006). The checklist is designed to help planners, managers and national and regional authorities assess current progress towards building effective MPA networks as well as to evaluate progress toward long-term network objectives. It can be used periodically throughout the process of design and implementation and to justify additional resources by demonstrating the improvements required to achieve best practices.

The checklist below provides an opportunity to gauge progress against perceived best practices and as described in this book through the case studies and chapters on planning and design. It can help identify the gaps or weaknesses that need to be addressed. The checklist reflects a shortened version of an original draft by Day and Laffoley (2006) and represents work in progress. Suggestions for amendments/improvements to the checklist are welcome. This checklist builds upon the principles and approaches of a range of checklists, including those by Staub and Hatziolos (2004), Mangubhai (no date), Corrales (2005) and Micronesians in Island Conservation (MIC) Network (2004).





Ecological monitoring is an important part of the success of MPAs

Table 1. The MPA network self-assessment checklist

To use the checklist (Day and Laffoley, 2006,) each question should be answered based on the current situation. Another option is to assign points to each question on a scale of 0 to 5 where 5 represents a 'yes' answer and 0 a 'no' answer and other points a 'partial'.

GUIDELINE	YES, NO, PARTIALLY
Broad-scale considerations and planning practices	
Scientific & information management considerations Has all available scientific information and local knowledge of stakeholders been used to support planning and management, and is it regularity updated and used for effective decision-making?	
Use of best available science & precautionary design Is the MPA network configured to take into consideration all or most of the scientific and socioeconomic information and traditional knowledge within the area, while uncertainty and lack of information has not delayed decision-making?	
Incorporate stakeholders Has a wide range of stakeholders (including local and regional stakeholders) been directly involved in planning the network and assisting the managers by being involved in virtually of the planning and management decisions for the network?	
Clearly defined objectives Is there a range of clear, achievable and measurable objectives (including ecological, social and economic objectives) defined for the MPA network and derived from the legislation?	
Integrated management framework Does the MPA network fit within a clear integrated and holistic framework, including both planning and management at differing scales (ranging from national planning frameworks, through to regional/local planning and site planning)?	
Adaptive management Is the MPA network readily able to incorporate changes such as new information from field experience or as a result of changing external circumstances?	
Economic & social considerations Does the design and implementation of the MPA network consider the economic and socio-cultural setting, as well as the real benefits and costs of the network (including both tangible and intangible benefits and costs)?	
Spatial & temporal considerations Does the MPA network design include a wide range of spatial and temporal considerations, such as ecological processes, connectivity and external influences, and do managers continue to consider these factors as part of ongoing implementation?	
Institutional & governance considerations Does the MPA network have well-established mechanisms for horizontal integration among all levels of government and vertical integration among agencies with different mandates, as well as involving local communities, indigenous peoples and regional groups?	

GUIDELINE	YES, NO, PARTIALLY
Ecological	
Size Has specific consideration been given to the size of the individual MPAs within the network to account for adult species movement ranges and larval dispersal distances to maximize the network's effectiveness in achieving its ecological objectives?	
Shape Has specific consideration been given to the shape of the individual MPAs within the network to account for edge effects and the enforceability of regularity shaped boundaries with clear delineation?	
Replication Does the MPA network include spatially separated replicates of no-take areas within the ecoregions to spread risk?	
Long-term protection Does the MPA network have an efficient combination of legistative Instruments (statutes, laws, regulations) and/or administrative instruments (policies) at various levels (local/state/national), that collectively provide long-term protection for the MPA network and ensure its viability?	
Full range of biodiversity in biogeographic region Does the MPA network fully represent the region by capturing the full range of biodiversity, ensure representation across depth ranges and biogeography, and ensure ecosystem integrity?	
Ecological linkages Is the MPA network purposefully designed to maximize all ecological processes (spatial and/or temporal) known to occur in the area?	
Implementation	
Political will & leadership Is there strong and effective leadership, commitment and support at both the political and agency levels, with a shared vision and capacity to achieve success?	
Public education, communication & awareness Is the community (including the local communities and the wider public) aware of the MPA network and the management agency(ies), through effective education outreach and communication plans?	
Compliance & enforcement Are feasible enforcement programs and methods to build compliance considered in the MPA network?	
Monitoring & assessment Does a monitoring and evaluation system exist showing progress against most, if not all, of the MPA network objectives being monitored regularly? Are the results widely disseminated and used in adaptive management?	
Sustainable financing Does the MPA network have a well-developed and periodically audited program of long-term funding (assessed, and if necessary, increased against a recognized financial index) to meet both core and emerging costs?	

11. LEVELS OF EVIDENCE NEEDED TO SUPPORT THE DEVELOPMENT OF THE MPA NETWORK

A key issue encountered in developing the MPA network is the level of evidence that would be needed to support such a process. The initial reaction is often that insufficient evidence is available to support systematic conservation planning. The reality, proved by past experience as well as current network development in parts of the world, is that sufficient evidence does exist to allow such processes to proceed (see best practice table 1, page 24). Since the earliest days of developing MPAs broad habitat types have been used as the basis for planning. The Great Barrier Reef Marine Park was established in the mid-1970s and yet is was not until some years later that accurate observations from satellite supported more detailed mapping of the region.

The evidence requirements to support the development of the MPA network will vary depending on the stage of the process. In identifying and recommending sites all sources of information should be used but usually sufficient data is available to define meaningful ecological regions as well as to provide a basic map of broad habitat types, physiographic features and patterns of currents and fronts. Coupled with data on the distribution of selected habitats and species, especially those of conservation concern, this usually proves an adequate basis to make qualified decisions on the placement of MPAs in the network.

As more information comes forward the resolution of the information can be improved and over time more sites added to strengthen the initial MPA network. Systematic conservation planning computer software packages can optimise decisions on where sites may ideally be placed. The identification of sites will also require information from any existing sites so known gaps in coverage can be determined. Information on the sensitivity of particular habitats and species to human pressures and impacts is also valuable in helping shape decisions on viability and protection measures that may be needed.

Discussion, consultation and designation of sites require more detailed information about the areas under consideration. At this stage in the process the focus turns from one about whether the MPA serves a general role in the network, to one over the extent and quality of habitats in relation to the proposed MPA boundaries. Information is also likely to be needed to explain about the interactions between activities and impacts and the habitats for which an individual MPA is being proposed. An understanding of this relationship is important to be able to develop and explain why certain protection or management measures will be needed to secure the conservation status of the habitat and/or species involved. Thus it is probable that in putting forward new areas to include in the MPA network specific study and survey may be needed. Broad-scale ship-borne remote sensing can quickly fill in gaps in understanding when coupled with sampling and ground-truthing, and universities and research institutes can provide valuable sources of information on habitat sensitivity to help inform management.

Final decisions on MPA network design may require further information and often the provision of further evidence on sites and/or features at most vulnerability and risk will prove helpful in such circumstances. Overall the approach outlined above means that the need for detailed information and requirements for additional survey and scientific research can be focussed more on the latter stages of the process, with broad-scale information driving the initial network considerations. Clearly this is an iterative process and the absence of information for some areas of sea should not preclude a broader movement towards starting to put the MPA network in place elsewhere.

12. HOW TO BUILD THE MPA NETWORK AT NATIONAL AND SUB-REGIONAL LEVELS: STAKEHOLDER ENGAGEMENT

As stressed through in this guidance the involvement of stakeholders is essential to the success of the MPA network. Not only do stakeholders play a critical role in delivering the day to day management needed to secure conservation features through their behaviours on sites, but they also possess valuable knowledge to inform the identification, management, surveillance and monitoring of MPAs. Providing a structured regionally–based process, driven by openly available ecological network guidance, will help engage and support discussions with stakeholders. Engaging local stakeholders at the local planning level will be key to the success of the network and its component MPAs.





The involvement of stakeholders is essential to the success of the MPA network (© RAC/SPA , Atef Limam)

Fostering cooperation between neighbouring countries also needs a clear commonly-held framework within which to have meaningful discussions. If all countries around the Mediterranean share a common understanding of the fundamental elements required to deliver an MPA network with an acceptance that many different programmes, all at different stages and scales, can over time feed into and help shape the network, then this may help Governments see how the process could develop and the role their work could play.

MPA network guidance recommendation 22: develop clear and easy to understanding information for all stakeholders on the benefits of the MPA network, and on the benefits that strict levels of protection can confer, in advance of engaging stakeholders with developing the MPA network.

Using eco-regions as fundamental units upon which to structure the development of the MPA network should provide a useful framework on which to build common processes. A common framework for the development of SPAs and the MPA network more broadly would also have considerable value beyond eco-regional scales, especially where the conservation of highly migratory species is concerned. This has the potential to foster closer engagement between countries geographically separate but linked by the needs of such wide-ranging species. A recurrent issue that arises in stakeholder engagement is explaining the benefits the MPA network can provide, and the benefits of strict protection as opposed to MPAs accepting the current management status quo. In particular there is a need to clearly explain what advantages an MPA network provides for management and to clearly explain what advantages and opportunities strict protection can provide. It is worth investing time and communication effort into such issues in advance of forming the network to head off misunderstandings in some stakeholder groups and proactive mis-information from other groups, notably those that percieve they may lose out such as commercial fishermen.

13. EXAMPLES OF GOOD PRACTICES

A number of countries and regions have made good progress with the development of guidance for implementing MPA networks. The list below is a small illustrative and selective subset of the official and informal reviews, resources and guidance available via the internet to give access to more detailed materials that lie behind these guidelines:

- UNEP – Their 2008 review of progress of National and Regional Networks of Marine Protected Areas. http://www.unep.org/regionalseas/publications/otherpubs/pdfs/MPA_Network_report.pdf)
- UK – Natural England's work on Marine Conservation Zones (http://www.naturalengland.org.uk/ourwork/marine/mpa/mcz/default.aspx)
- Scotland's work on MPAs and MPA networks (http://www.scotland.gov.uk/Topics/marine/marine-environment/mpanetwork/mpaguidelines/)
- Work on MPAs in Wales (http://www.ccgc.gov.uk/landscape--wildlife/managing-land-and-sea/marine-policies/planning--management/marine-protected-areas.aspx)
- Work on MPAs in Northern Ireland (http://www.doeni.gov.uk/niea/mpa-report_amended.pdf)
- OSPAR – work on ecological MPA network guidance (http://www.ospar.org/content/content.asp?menu=00700302210000_000000_000000)
- Canada – Guidance and lessons learned for Canada's Marine Protected Area Network (http://assets.wwfca.bluegecko.net/downloads/mpaworkshopproceedings_en.pdf)
- New Zealand – Marine Protected Areas – Policy and Implementation Plan (http://www.biodiversity.govt.nz/pdfs/seas/MPA-Policy-and-Implementation-Plan.pdf)
- Australia – scientific principles for design of marine protected areas in Australia (http://www.uq.edu.au/ecology/docs/Scientific_Principles_MPAs_c6.pdf)
- Asia - Coral Triangle – USAID Asia and the Coral triangle Support Partnership's guidance on designing resilient networks of Marine Protected Areas (http://www.coraltriangleinitiative.org/sites/default/files/resources/MPA%20Network%20Design_Principles_Full%20Report_FINAL_CTSP%20Jan%2023%202012.pdf)



Barda Island, Libya (© RAC/SPA, Mathieu Foulquié)

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This guidance document draws on significant work undertaken by many organisations over the last 20 years. In order to keep the document simple and short as per the contract brief references have been kept to a minimum. Some work on MPA networks is however of such direct importance and relevant to this report that it deserves special mention. In particular the author recognises and gratefully acknowledges the work of the CBD, Natural England and the Joint Nature Conservation Committee, OSPAR and IUCN WCPA – Marine on network guidance for MPAs. The author was involved in some way in the development of all these guidance documents, either as the main writer, a contributor, reviewer, or as a leader, and this experience in part provides the basis for this document. This is alongside experiences and inspirations derived from working with many individuals of note on many similar MPA network initiatives throughout the world.

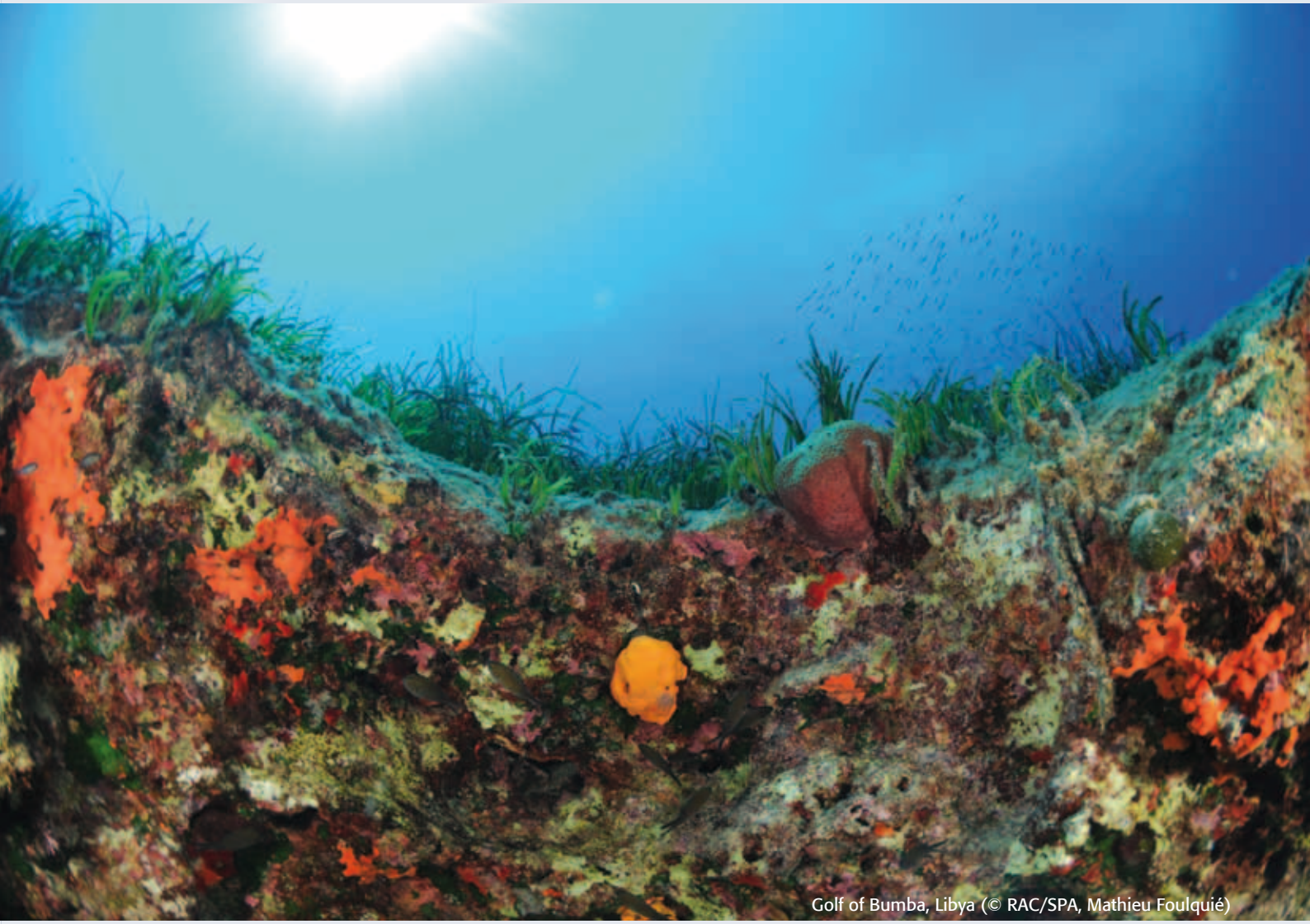
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Al-Raoucheh, Lebanon (© RAC/SPA, Yassine Ramzi Sghaier)

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Golf of Bumba, Libya (© RAC/SPA, Mathieu Foulquié)

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