Project for the preparation of a Strategic Action Plan
for the Conservation of the Biodiversity in the Mediterranean Region
(SAP BIO)

Biodiversity of coastal wetlands in the Mediterranean

UNEP

MAP

MedWet

GEF

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RAC/SPA - Regional Activity Centre for Specially Protected Areas
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The present document has been prepared in the framework of the SAP BIO project, through a memorandum of understanding (MoU) between RAC/SPA in Tunis and the MedWet Co-ordination Unit in Athens.

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List of abbreviations

CBD	Convention on Biological Diversity
CITES	Convention on International Trade of Endangered Species
COP	Conference of the Contracting Parties
GEF	Global Environment Facility
ICAM	Integrated Coastal Area Management
MAB	Man and the Biosphere Programme, UNESCO
MAP	Mediterranean Action Plan
MCSD	Mediterranean Committee on Sustainable Development
MedWet	The Mediterranean Wetlands Initiative, Convention on Wetlands
MoC	Memorandum of Collaboration
MoU	Memorandum of Understanding
NGO	Non-governmental organisation
RAC/SPA	Regional Activity Centre for Specially Protected Areas
Ramsar	The Convention on Wetlands (Ramsar, 1971)
SAP BIO	Strategic Action Plan for Biodiversity
SMAP	Short and Medium-Term Priority Environmental Action Programme, EU
SPAMI	Specially Protected Areas of Mediterranean Importance
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme

Preface

The present document has been prepared in the framework of the SAP BIO project, through a memorandum of understanding (MoU) signed on 20 November 2002 between RAC/SPA in Tunis and the MedWet Co-ordination Unit in Athens. The main purpose of the MoU is as follows:

'The coastal wetlands are considered hot spots of biodiversity. In order to better take into account these important areas in the preparation of the Strategic Action Plan for the conservation of marine and coastal biological diversity in the Mediterranean region, a document, specific to the Mediterranean, that will stress the role of wetlands as biodiversity hot spots and, taking into account the existing initiatives, will suggest regional actions to be made for the conservation of these areas should be prepared.'

This is further analysed into four objectives:

- Prepare a document which synthesises the main scientific knowledge on the Mediterranean wetlands (coastal lagoon, estuary, ...)
- Identify their role in the conservation of biodiversity.
- Identify gaps and problems in the conservation of Mediterranean wetlands.
- Taking into account the existing initiatives, suggest regional actions to be made for the conservation of these areas.

Methodological remarks

(a) This document has benefited from an analysis of the national reports, prepared in 2002 in the context of the SAP BIO project[1]. It has also taken into account the National Reports on wetlands that have been submitted to the Convention on Wetlands prior to the Eight Conference of its Contracting parties (Valencia, Spain, November 2002)[2]. In addition, it has been enriched by the experience gained during 12 years of activities in favour of Mediterranean wetlands within the framework of MedWet, for which the author is grateful to all its partners.

(b) As there has not yet been any agreement concerning the definition of coastal zones, with some states including a strip of only a few meters and others the entire hydrological basins of major rivers, the document adopted a pragmatic view, looking at Mediterranean wetlands from a broader perspectives. In this context, it has considered countries such as Bulgaria, FYR of Macedonia, Jordan and Portugal, which are members of MedWet but are not included in the Barcelona Convention.

Finally the author wishes to thank Dr. Christian Perennou, of the Station biologique de la Tour du Valat, and Ms. Angela Kyriazis, of the MedWet Co-ordination Unit, for reviewing the draft text and making useful suggestions and corrections. Naturally, the views represented in the document are those of the writer.

1 On the basis of detailed specifications prepared by RAC/SPA.
2 As analysed and compiled skilfully by Carlos Villalba Alonso, Technical Officer at the Ramsar Bureau.

1. Introduction

1.1 The SAP BIO Project

The project for the preparation of a Strategic Action Plan for Biodiversity in the Mediterranean (SAP BIO), approved within a broader context by the GEF Council in April 2000[1], has been entrusted to RAC/SPA, an organ of the Barcelona Convention based in Tunis.

1.1.1 Scope and objectives

The SAP BIO project concerns mainly the marine and coastal areas, including coastal wetlands. Unfortunately, there was no common agreement on criteria for the definition of coastal zones, but the matter was left to each individual state. As a result, there are wide differences in the approach to coastal zones, from a few metres in certain extreme cases, to the inclusion of entire river basins in others. Obviously this creates difficulties in the determination of which wetlands can be considered coastal. For the purposes of the present paper, a pragmatic approach was adopted.

The main objective of the project is to establish over a 30-month period a logical and systematic base for the implementation of the new Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean Sea, which entered into force in December 1999[2]. In particular, the SAP will focus on the conservation of coastal and marine habitats and species. It will also include a number of Priority Actions at the national level.

1.1.2 Structure and implementation

A double approach has been incorporated in the development of the project. On the one hand, RAC/SPA, with the assistance of experts, has prepared the terms of reference for each action, and has organised meetings, evaluations of reports and the actual drafting of the SAP. On the other, the countries participating –through national focal points– have drafted National Reports, which have formed the basis of the whole exercise and have provided significant inputs for the SAP and for establishing the list of Priority Actions.

All of this work has been done with clear references to obligations undertaken by the countries under other conventions (such as CBD and Ramsar) and in collaboration with organisations active in biodiversity issues in the Mediterranean.

1.2 Collaboration on Mediterranean wetlands

The Mediterranean Region is fortunate as extensive international collaboration on wetlands has been cultivated in it as early as the 1960s[3], which has led to the establishment of the Convention on Wetlands[4]. Since then such collaboration has been intensifying on both the international and the bilateral level, and has resulted in the growth of strong networks.

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1 The full title of the wider proposal in which SAP BIO is included was "Determination of priority actions for further elaboration and implementation of the Strategic Action Programme for the Mediterranean Sea".

2 Replacing the Protocol concerning Mediterranean Specially Protected Areas, which was adopted in 1982.

3 Culminating in the crucial MAR Conference organised in Saintes-Maries-de-la-Mer, in the Camargue region of France, in 1962.

4 Which was signed in Ramsar, Iran in 1971 and came into effect in 1974.

1.2.1 The MedWet Initiative

Perhaps the major network on wetlands in this region is the Mediterranean Wetlands (MedWet) Initiative. Launched in mid-1991 by a small group of international and non-governmental organisations and states[5], its purpose was to implement the Grado[6] goal of "stopping and reversing the loss and degradation of Mediterranean wetlands". In a first phase (1992-1996), MedWet focused –through an EC-funded project– on the development of appropriate methods and tools and of a strategy for the conservation and sustainable use of wetlands in the region[7].

At the same time, MedWet was placed under the aegis of the Convention on Wetlands and a Mediterranean Wetlands Committee (MedWet/Com) was established as a guiding and supervisory body. MedWet/Com includes among its members 25 states, the European Commission, three international conventions, UNDP and seven international NGOs and wetland centres. This structure was officially recognised in 1999 by the 7th Ramsar Conference of the Contracting Parties (San José, Costa Rica), while COP8 in 2002 (Valencia, Spain) approved a Resolution on regional initiatives of the Convention, using MedWet as a model.

Today MedWet is involved in a number of projects in favour of wetlands, and operates various networks (consisting of wetland centres, regions, NGOs, salinas etc.). It is managed by a Co-ordination Unit, with offices in Athens, Greece, which is considered an outposted part of the Ramsar Bureau.

1.2.2 The Barcelona and the Ramsar Conventions

Informal collaboration between the Barcelona and the Ramsar Conventions has existed since the early 1990s. In fact, RAC/SPA has participated in the first meetings in Italy that launched the MedWet Initiative. Since 1998, when MedWet/Com started operating, the Barcelona Convention has become one of its members and has been usually represented in its meetings by RAC/SPA, while joint activities have been carried out.

Finally, in early 2001 a memorandum of collaboration was signed between UNEP/MAP Co-ordination Unit and the Ramsar Bureau –representing the two conventions– concerning collaboration in the Mediterranean. The main points agreed were the following:

- Encouragement of membership in both conventions.
- Provision of legal protection to all Ramsar sites, so that they can be classified as
- SPAMI under the Barcelona Convention with the next ten years.
- Reinforcing the management and conservation of Mediterranean wetlands.
- Exchanging information and mutual participation in technical meetings of mutual interest.
- Co-ordinating and complementing tools developed by the two sides, particularly in the area of site inventories.
- Developing joint guidelines for the sustainable management of wetland resources in the framework of the Mediterranean Committee on Sustainable Development.

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[5] Such as the Ramsar Bureau, IWRB, Tour du Valat, WWF Italia, Greece and Italy.
[6] International Symposium on Mediterranean wetlands and their birds, Grado Italy, February 1991.
[7] Which was endorsed in a major conference in Venice in May 1996.

In addition, the MoC provides for the preparation of joint operational plans on a biannual basis, which concern the activities mainly of MedWet and RAC/SPA. In this context, MedWet has contributed to the part of SAP BIO related to coastal areas and wetlands[8] and has been responsible for the preparation of the present paper. In addition, it participates in the Steering Committee of the project.

It should be noted that the close collaboration between the Barcelona and Ramsar Conventions is highly advantageous as the first represents the environmental arm of the UN structure in the region, and the second is dedicated solely to wetlands and water and has a strong regional presence.

In all the Mediterranean countries, measurements of management are undertaken at various levels, to counter the loss of the biodiversity. *Photo R.Tinarelli.*

[8] Through Thymio Papayannis, its Senior Advisor.

PART I

BIODIVERSITY IN WETLANDS

1.

The coastal wetlands of the region

1.1. Distribution

Wetlands are distributed along the entire coastal zone of the Mediterranean[9] in a rather equitable manner. Unfortunately, there is not yet an integrated inventory of all wetlands in this region. Such an exercise has started in 1996 through the application of the MedWet Inventory System and database, but is not expected to be completed before 2010. In the meanwhile, one can consider as an indication the distribution of Ramsar Sites, taking of course into consideration the arbitrariness that is related to their designation[10].

In 2000, the Greek Biotope / Wetland Centre (EKBY) prepared for MedWet a map of Ramsar Sites in the countries members of the Mediterranean Wetland Committee, which is still a useful tool as to their location and distribution. Its updating, however, is necessary at present as new sites have been added to the Ramsar list (from new contracting parties such as Libya, Cyprus and Bosnia and Herzegovina, or from older ones, such as the 10 sites added recently by Algeria and another 10 by Spain).

The EKBY / MedWet map indicates a higher density of Ramsar Sites in the North of the Basin, in comparison to the drier South, but this may be due more to administrative and political reasons than to physical ones.

1.2. Trans-boundary sites

As the drawing of national frontiers has resulted from historical events, with limited consideration of geomorphologic factors, it is only to be expected that a considerable number of ecologically sensitive areas are found in border zones, and are shared by two or more countries. The presence of water, in rivers and lakes and other wetlands, because of its inherent mobility, presents special challenges.

The growing understanding of the advantages of joint management for shared natural resources is a hopeful sign. This is particularly significant in the case of shared water systems, where trans-boundary collaboration is very much required and can lead to increased efficiency and wider public awareness. A few particular examples should be mentioned in this context as an indication of the existing possibilities:

- Integrated management of the Neretva River and its wetlands (between Bosnia and Herzegovina and Croatia). With the assistance of the European Commission, the Convention on Wetlands and MedWet, the REReP Programme and Monaco, collaboration efforts are progressing positively.
- Joint management of the freshwater resources of the Dragonja River (between Croatia and Slovenia). Assisted by the World Bank and METAP, a first workshop is planned within the current year.

[9] The entire coastline of the Mediterranean Sea is 46,270 km.

[10] Although specific criteria exist in the official documents of the Convention on wetlands, proposing a site for designation is at the discretion of national authorities, which also decide on the extent and zoning of each site.

- Integrated Coastal Management between Jbeil / Amsheet (Lebanon) and Latakia (Syria). This collaboration has been initiated due to the acute water shortage problems in the area.
- Co-operation project[11] being launched for the Bojana-Buna River Delta, a triangular area of 50,000 has, between Lake Skadar/Shkodra and the Adriatic Sea. This important wetland site is shared by Albania and Montenegro.

In addition, Greece and Turkey have been considering the possibility of joint management of the lower course of the Maritsa / Meric / Evros River, eventually in collaboration with Bulgaria. This is no easy task in view of the sensitive political and military situation of this frontier zone.

Although not a coastal site, the case of the Prespa Lakes Trans-boundary Park (shared by Albania, Greece and the FYR of Macedonia) should be mentioned as a good example of collaboration[12]. After the initial decision of the three states in 2000, a Co-ordination Committee for this shared wetland has been established and a Strategic Action Plan for the region has been jointly prepared. A large GEF project is currently in development for nature conservation, social development and sustainable resource use.

1.3. Designations

Wetland sites have been designated officially for conservation under various national and international legal statuses. There is a wide variety of national designations from country to country, which merit a new systematic analysis[13]. On the international level, the most important designations are analysed briefly below.

1.3.1. Ramsar Wetlands of International Importance

Approximately 150 wetland sites in the Mediterranean have been inscribed in the List of Wetlands of International Importance of the Convention on Wetlands (the 'Ramsar list')[14]. Among the most important ones are the Guadalquivir Delta in Spain, the Camargue in France, the Neretva Delta in Croatia, the Amvrakikos Gulf in Greece, Lakes Burullus and Bardawil in Egypt, Ichkeul Lake in Tunisia, El Kala in Algeria.

A complete list of Ramsar sites is included in Appendix I. It should be noted that the size of these wetlands varies from 50,000 has (as in the case of Egypt) to a few hundred has (as for some of the Italian sites). This illustrates not only physical specificities, but a profound difference in the concept of a Ramsar site. In a narrow view, this is limited only to the core zone of the wetland itself, an area of absolute protection, while in a broader one it includes a much larger area, incorporating various zones of human activities and settlements.

[11] Proposed in February 2003 by the European Natural Heritage Fund (Euronatur).

[12] In which MedWet / Ramsar and WWF International have played a catalytic role.

[13] For a previous such analysis, see 'Legal and administrative framework fro Mediterranean wetlands' in Morillo 1996, pp. 13-172.

[14] All states in the region are Contracting Parties to the Convention on Wetlands, and participate in its Mediterranean Wetlands Committee (MedWet/Com).

Some of the Ramsar sites have been inscribed in the Montreux Record, which indicates that they may undergo serious ecological change, and, therefore, merit greater attention and resources to avert it. In the Mediterranean, there are 18 Montreux sites. Unfortunately, this useful tool for identifying sensitive wetlands has not been used in an active way and perhaps its operation needs to be reconsidered.

Ichkeul Lake : a Ramsar Wetlands of International Importance. *Photo MedWet*

1.3.2. Specially Protection Areas of Mediterranean Importance (SPAMI)

As already noted in the Introduction, the new Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean Sea, which entered into force in December 1999, provides for the designation of sites of high biodiversity as Specially Protected Areas of Mediterranean Importance (SPAMI). In the SPAMI List will be included sites, which:

- are of importance for conserving the components of biological diversity in the Mediterranean;
- contain ecosystems specific to the Mediterranean area or the habitats of endangered species;
- are of special interest at the scientific, aesthetic, cultural or educational levels.

The Protocol applies not only to marine areas of the Mediterranean, but also to 'the terrestrial coastal areas designated by each of the Parties, including wetlands'.

The SPAMI sites must have legal protection status, and the corresponding Protocol includes specific responsibilities of the countries designating them for their management and conservation. provision is also made for bilateral collaboration in the case of border or transboundary sites.

As yet there is no detailed list of SPAMIs. However, under the older Protocol on Specially Protected Areas, the following wetland sites (among a total of 122) had been included in the Directory of Marine and Coastal Protected Areas prepared by RAC/SPA.

Country	Site	Ramsar Site
Albania	Kune Natural Reserve	
Algeria	El Kala National Park Reghaia Managed Nature Reserve	
Croatia	Neretva Delta Nature Reserve	
Cyprus	Larnaka Lake Nature Reserve Limassol :ake Nature Reserve	
Egypt	Bardaweel / El Zaranik Wetland Nature Reserve Ashtoum El Gamil – Tanees Island	
France	Camargue National Reserve - Camargue Regional Natural Park Estagnol Nature Reserve Bagnas Lagoon Nature Reserve Mas Larrieu Nature Reserve	
Greece	Amvrakikos Gulf Wetland	
Israel	Taninim River Nature Reserve	
Italy	Burano Nature Reserve Castellabate Fishery Reserve Circeo National Park Maremma Regional Natural Park Orbetello and Feniglia Nature Reserve Portoferraio Fishery Reserve	

Table 1. Main wetland sites listed as SPAs in the RAC/SPA Directory

1.3.3. Natura 2000 Sites

The Natura 2000 Sites will be designated in accordance with Art. 6 of the Habitats' Directive 92/43/EEC[15], within the territory initially of the five Mediterranean EU-member states. These sites concern *natural habitat types of Community interest'* which:

- are in danger of disappearance in their natural range; or
- have a small natural range following their regression or by reason of their intrinsically restricted area;
- present outstanding examples of typical characteristics of one or more of the six following biogeographical regions: Alpine, Atlantic, Boreal, Continental, Macaronesian and Mediterranean.

The ambitious aim is to create: "A coherent European ecological network of special areas of conservation shall be set up under the title Natura 2000. This network, composed of sites hosting the natural habitat types listed in Annex I and habitats of the species listed in Annex II, shall enable the natural habitat types and the species' habitats concerned to be maintained or, where appropriate, restored at a favourable conservation status in their natural range". Sites to be included in the network have been classified on the basis of floristic characteristics.

Annex I of the 'Habitats' Directive (entitled 'Natural Habitat Types of Community Interest whose Conservation requires the designation of Special Areas of Conservation') includes quite a number of habitats of Mediterranean importance, such as:

[15] Which followed and completed the 'Birds' Directive 79/409/EEC.

- 1130 Estuaries
- 1140 Mudflats and sandflats not covered by seawater at low tide
- 1150 Coastal lagoons
- 1160 Large shallow inlets and bays
- 1410 Mediterranean salt meadows (*Juncetalia maritimi*)
- 1420 Mediterranean and thermo-Atlantic halophilous scrubs (*Sarcocornetea fruticosi*)
- 3120 Oligothrophic waters containing very few minerals generally on sandy soils of the West Mediterranean, with *Isoetes* spp.
- 3170 Mediterranean temporary ponds
- 3250 Constantly flowing Mediterranean rivers with *Glaucium flavum*

It should be pointed out here that opposite to other international designations, which depends solely on the willingness of member-states, in the preparation of the lists of Natura 2000 sites the European Commission has an important voice.

Unfortunately, ten years after the approval of the 'Habitats' Directive. the time-tables proposed for the finalisation of the lists have not been respected, and the delays in the case of certain member-states are considerable [16]. Still, the sites proposed cover 15% of the territory of the EU and it is hoped that the network will be fully constituted within this decade. However, to make it truly operational detailed guidelines will be needed on the implementation of conservation measures outlined in the Directive. Some have already been published at the national level, for example the *Cahiers d'habitats* in France, to assist with the practical management of habitats of European concern. Also, a monitoring system must be developed for assessing progress and implementing enforcement measurements as required.

A serious problem remains with areas rich in biodiversity that will be left out of the Natura 2000 Network, as the danger is that they will be totatlly abandoned by both the European Commission and the member-states.

In view of the continuing negotiations with accession countries, it is estimated that the concept of Natura 2000 will be extended in the near future to other Mediterranean countries, starting with Cyprus and Malta.

1.3.4. MAB and World Heritage Sites

Biosphere Reserves are defined as 'areas of terrestrial and coastal ecosystems, which are internationally recognised within the framework of UNESCO's Man and the Biosphere (MAB) Programme'. Some of these are wholly or partially Ramsar Wetlands. Some are included as World Heritage Sites, also under UNESCO, which have been selected on the basis of both their cultural and natural heritage. A comparison of the three categories is shown in Table 2, with the dates of designation in parentheses.

[16] With Belgium, France and Germany being more in the rear.

Country	World Heritage	Biosphere Reserve	Ramsar Wetland
Albania	Butrint (1992, 1999)		Butrint (2002)
Algeria		El Kala (1990)	Lac Oubeira (1983) Lac Tonga (1983)
Bulgaria	Srebarna Nature Reserve (1983)	Srebarna (1977)	Srebarna (1975)
Croatia	Plitvlice Lakes National Park, Croatia (1979, 2000)		
France		Camargue (1977)	Camargue (1986)
Portugal		Paúl do Boquilobo (1981)	Paúl do Boquilobo (1996)
Spain	Doñana National Park (1994)	Doñana (1980) Mancha Himeda (1980) Marismas del Odiel (1983) Urdaibai (1984) Cabo de Gata-Nijar (1997)	Doñana (1982) Las Tablas de Daimiel (1982) Marismas del Odiel (1989) Ria de Mundana-Guernika (1993) Salinas del Cabo de Gata (1989)
The FYROM	Ohrid region (1975)		
Tunisia	Ichkeul National Park (1980)	Ichkeul (1977)	Ichkeul (1980)

Table 2. Correspondence of World Heritage, Biosphere Reserves and Ramsar Sites

It should be noted that most of these designations date from the 1970s and 1980s, without too much progress being made (such as in the case of Ichkeul), and there are very few newer additions, which are worrisome facts.

1.4. Cultural values

The cultural values of Mediterranean wetlands have only recently been recognised and initial studies on them have been launched. Yet water has been a key factor in the development of Mediterranean civilisations, most of which grew close to rivers and wetlands.

A catalytic event has been the Technical Session with the theme 'Cultural values of wetlands', held in Djerba, Tunisia in May 2000, in the framework of MedWet/Com3[17]. It was reinforced a year later in Sesimbra, Portugal with a Technical Session on 'Salinas, traditional practices and sustainable future', held during MedWet/Com4. Base on these initiatives, the Ramsar Bureau submitted to COP8 Resolution VIII.19 on the cultural values of wetlands and their incorporation in wetland management, including background documentation, which was approved in Valencia, Spain, in November 2002.

[17] Third Meeting of the Mediterranean Wetlands Committee, Convention on Wetlands.

Already work for the implementation of the Resolution has started in a few Mediterranean sites co-ordinated by MedWet (Albufera de Valencia in Spain, Zaranik in Egypt, Prespa Lakes in Albania, Greece and the FYR of Macedonia).

It is hoped that this additional approach will help in rebuilding the traditional links of local populations with their wetlands, and attract visitors, who can provide benefits to the local economies.

Some wetlands support traditional activities that represent part of the history of the nation. The mussel culture is among these practices. *Photo MedWet*

2.

Flora and fauna

There are many species that depend on wetlands, at least during a part of their life. For a considerable number, water and wetlands are absolutely necessary for the completion of their biological cycle, and thus are totally dependent on them. Both constitute the biodiversity of these rich and productive in biomass ecosystems.

2.1. Biodiversity[18]

Due to its position, its geo-morphological diversity, the hydrological, soil and climatic conditions, as well as the traditional human activities, a variety of microhabitats with rich or unique vegetation and plant formations have been created along the Mediterranean Basin. Thus the resulting biodiversity of the region in both flora and fauna species is considered to be very high, in spite of extensive loss and degradation of sensitive habitats, mainly during the 20th century. Much of it is concentrated in the wetlands of the region, as illustrated by the considerable number of Mediterranean Ramsar sites, which have been designated on the basis of biodiversity criteria[19].

The wetlands of the region are extremely important for migrating birds. Many millions of birds each year use them as stopovers for feeding, wintering or breeding during their migration between Africa and Europe. *Photo F.Mâamouri*

Two characteristic examples are the Marismas of Guadalquivir in Spain and Lake Mikri Prespa shared by Albania and Greece. The first hosts each winter large numbers of migrating birds, often exceeding 200,000, including such species as *Ciconia ciconia*, *Anser anser*, *Platalea leucorodia* and *Anser clypeata* and *Porphyrio porphyrio*. The second includes very large (and growing) breeding colonies of *Pelecanus crispus* and *P. onocrotalis*, as well as *Phalacrocorax pygmaeus*. In the Camargue is found one of the two largest nesting colonies of *Phoenicopterus rubber roseus*, with populations that exceed 10,000 pairs. Of the wintering Western Palearctic population of *Fulica atra* 50% is found in the Mediterranean.

There are many ways to assess the Mediterranean biodiversity on the global scale. An interesting approach is through the WWF International selection of the 200

[18] For wetland fauna, see also *Zones Humides Information*, No 38, 4th trimester 2002, SNPN, Paris, pp. 2-15.

[19] A similar analysis can be found in the PDF document for the GEF MedWetCoast Project

Global Priority Ecoregions (ER), made public in 2001, on which conservation and sustainable use efforts should be focused. In this prestigious list, the Mediterranean appears five times, as follows:

- European Mediterranean montane mixed forests (ER 77).
- Mediterranean forests, woodland and shrub (ER 123).
- Balkan rivers and streams (ER 180).
- Anatolia freshwater (ER 195).
- Mediterranean Sea (ER 199).

In any case, in the preparation of the SAP BIO Project proposal the biodiversity of the Mediterranean Basin has been briefly but convincingly documented[19].

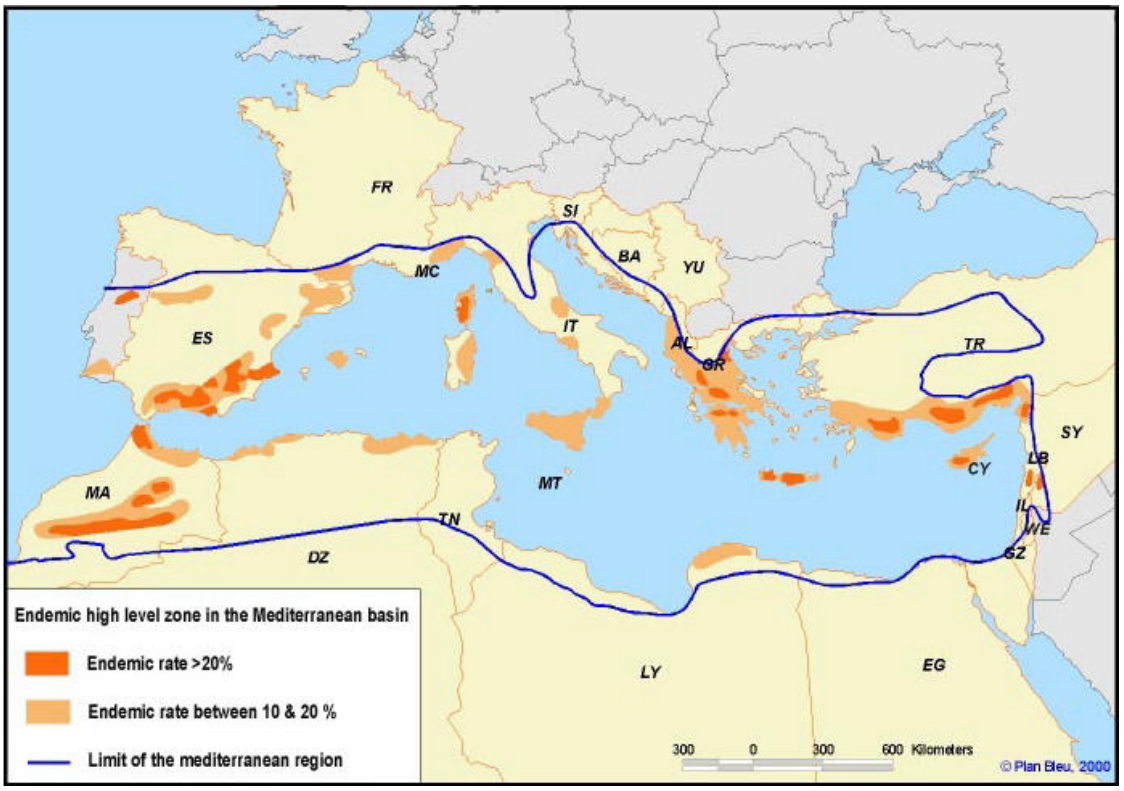
2.2. Endemism

In WWF's study of Ecoregions, the ones in the Mediterranean mentioned above have been selected mainly because of their high level of endemism in both flora and fauna. For example, one of the most prominent characteristics of Mediterranean flora is the high number of endemic plant species or subspecies, reputed to number around 13,000[20]. There are also very many endemic freshwater fish in the region; only in the Balkans they exceed thirty species[21]. Concerning amphibians, of the approximately 50 species found in the Mediterranean, 27 are endemic. Wetlands are also habitats of various endemic reptiles, most prominently several species of terrapins.. There is also considerable endemism among invertebrates.

The following map by Plan Bleu indicates the areas with the highest endemism in the region.

[20] According to the WWF Mediterranean Programme.

[21] Such as *Barbus prespensis* in Prespa and *Pungitius hellenicus in* the sources of Sperchios River, both in Greece.



2.3. Threatened and endangered species

There have been various attempts to establish lists of endangered species in the Mediterranean, which have met with various degrees of criticism. Annex II of the Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean, adopted in November 1996, provides such a list of general acceptance (see Table 3 below). Although the Annex focuses more on the marine environment, it includes a considerable number of coastal and wetland species, such as:

- 15 bird species, including *Pandion haliaetus, Falco elenorae, Numenius tenuirostris,* both *Phalacrocorax aristotelis* and *P. pygmaeus,* both *Pelecanus crispus* and *P. onocrotalus,* as well as *Phoenicopterus ruber.*
- A few species of amphibians and reptiles[22], among which 4 species of marine turtles, which nest on beaches.
- A small number of freshwater fish (such as *Valencia hispanica* and *Valencia letourneuxi*).
- Various mammals, which include *Monachus monachus*, but also *Canis aureus, Lutra lutra and Lynx pardina*[23].

It should be noted here that knowledge of the very important freshwater fish in the region is very limited, although they merit much greater attention[24].

[22] See Morand A. (2001), *Amphibians and reptiles*, MedWet / Tour du Valat Publication, Arles, France.
[23] Found only in southern Spain.
[24] See Maitland P.S. and A.J. Crivelli (1996), *Conservation of freshwater fish*, MedWet / Tour du Valat Publications Series n. 7, Arles, France.

Endemic lizard Podarcis melisellensis ssp. Pomoensis from the island of Jabuka. *Photo B. Jalžić.*

Freshwater endemic fish species	**Priority indicated by country**
- *Chondrostoma kneri* (Neretvian Nase)	Bosnia and Herzegovina
In the underground waters of Croatia: - *Aulopyge hugeli* (Dalmatian Barbelgudgeon) - *Chondrostoma phoxinus* (Minnow Nase) - *Knipowitschia punctatissima croatica* (Vrgorac Go-by) - *Leuciscus polylepis* (Croatian Dace) - *Leuciscus svallizae* (Balkan Dace) - *Leuciscus ukliva* (Cetina Dace) - *Phoxinellus sp.* (Minnow)	Croatia
- *Aphanious iberus* - *Valencia hispanica* (Valencia Toothcarp)	Spain
Amphibians, Lizards and Reptiles	
- *Podarcis melliselensis* - *Proteus anguinus* (Olm) - *Triturus vulgaris subsp.schreiberi* (Smooth Newt)	Croatia
- *Chelonia mydas* (Green Turtle) - *Dermochelys coriacea* (Leatherback Turtle)	
- *Testudo kleinmanni* (Egyptian Tortoise)	Egypt
Bird species	
- *Calonectris diomeda* (Cory's Shearwater) - *Falco eleonorae* (Eleonora's Falcon) - *Hydrobates pelagicus* (Storm Petrel) - *Larus audouinii* (Audouin's Gull) - *Numenius tenuirostris* (Slender Billed Curlew) - *Pandion haliaetus* (Osprey) - *Pelecanus crispus* (Dalmatian Pelican)	

- *Pelecanus onocrotalus* (Great White Pelican) - *Phalacrocorax aristotelis* (European Shag) - *Phalacrocorax pygmeus* (Pygmy Cormorant) -*Phoenicopterus rubber* (Greater Flamingo) - *Puffinus yelkouan* (Yelkouan Shearwater) - *Sterna albifrons* (Little Tern) - *Sterna hirundo* (Common Tern) - *Sterna sandvicensis* (Sandwich Tern)	
- *Phalacrocorax aristotelis desmarestii* (Shag) - *Puffinus mauretanicus* (Balearic Shearwater)	Algeria Libya Spain Tunisia
- *Sterna bengalensis* (Lesser Crested Tern)	Libya
Mammals	
- *Lutra lutra* (Otter) - *Lynx pardinus* (Iberian Lynx)	Spain
- *Canis aureus* (Golden Jackal)	Albania Egypt Greece Turkey
- *Arvicanthis niloticus* (Nile Rat) - *Felis chaus* (Jungle Cat) - *Gazella dorcas dorcas* (Dorcas Gazelle) - *Herpestes ichneumon* (Egyptian Mongoose) - *Hystrix indica* (Indian Porcupine) - *Meriones sacramenti* (Buxton's Jird) - *M. tristrami* (Tristram's Jird) - *Vormela peregusna* (Marbled Polecat)	Egypt

Table 3. Priority endangered species (according to the Protocol concerning Protected Areas and Biological Diversity in the Mediterranean[25]

However, knowledge on species distribution, threats, and habitats is still quite far from complete. As a result special attention should be given in implementing priority regional and national actions for vegetation and the flora species, so that they are not based on insufficient scientific data. They should be based instead on sound research and inventories and action plans, accomplished first at the national level of each country.

2.4. Invasive species

The wilful or accidental introduction of exotic species is not a new phenomenon in the Mediterranean, because of its pivotal location among three continents and the trade routes that cross it, as well as the existence of large harbours, which connect it to the Americas. It has been, however increased exponentially during the past century, due to the expanse in the volume and frequency of transport, climate change[26] and the disappearance of a number of indigenous species. Among the most characteristic cases of introduced exotic species are the following:

- The South American *Myocastor coypus* (Coypu), which is found from the Camargue to the Balkans.

[25] Some parts of this Protocol may need re-adjustment. Flamingos, for example, cannot be considered anymore a threatened species in the Mediterranean.

[26] Which may favour the Lessepsian migration of warmer water species from the Red Sea.

- The *Ondatra zibethicus* (Muskrat) from North America .
- *Myriophillum brasiliense*, *Ludwigia grandiflora* and *L.* peplodes, which are South American aquatic plant.
- Australian Eucalyptus trees, which have become ubiquitous in the region.
- The *Salma gairdneri* (American Rainbow Trout), preferred by many anglers.
- *Procambarus clarkii* (Louisiana Crayfish), commercialised in Spain.
- The Central American grass *Paspalum paspalodes*, used for fodder in the Kerkini Lake of Northern Greece.

Serious health problems to local populations of Eels (*Anguila anguilis*) have been caused by the introduction of *A. japonica* and *A. australis*. Of particular importance is the hybridisation of *Oxyura leucocephala* (White-headed Duck) by the introduction and spread of *O. jamaicencis*, the North American Ruddy Duck, in spite of efforts for the control of its intruder populations.

In the marine coastal strips, the spread of *Caulerpa taxifolia* has also resulted in serious ecological problems, menacing local biodiversity.

PART II

CONSERVING AND ENHANCING BIODIVERSITY

3.

Pressures and threats

There are many ways to classify pressures and threats. A useful way is to identify first the root causes, which are at the origin of the problems And then to divide the rest into reversible and irreversible ones. Obviously, priority should be given to measures that might reduce the impact of root causes, in spite of the difficulties this entail. In turn, to address mainly irreversible pressures and threats.

3.1. Root causes

Often root causes are not understood as being directly related to pressures and threats on biodiversity, or they are considered –with a degree of fatalism– as unmanageable. Yet, it is evident that unless root causes are addressed, any measures taken at lower levels can only provide a limited and temporary relief.

In our opinion, there are two such root causes, which are closely interlinked, a rapidly growing human population in the South and East of the Basin, and the increasing disparity between the affluent and less developed countries of the Mediterranean Basin.

3.1.1. Population pressures

During the second half of the 20th century, the population growth of a number of Mediterranean countries has been phenomenal. Already the population in the coastal zones has exceeded 130 million people. Although there are indications of a demographic slowing-down, the projections for the beginning of the 21st century are alarming (see Table 4) [27]. According to Plan Bleu projections, from 2000 to 2025 the population of countries in the northern rim of the Mediterranean will increase from 192 to 196 millions only, while in the southern and eastern rim from 235 to 327 millions. This population growth results in high unemployment (especially among the young), in a large strain on social and technical infrastructure, in rampant urbanisation, and in a mounting pressure on all resources, especially space, food and water.

The problems are exacerbated by two additional factors:

- The internal emigration of inhabitants from inland regions to the coastal zones, as in Algeria, Tunisia and Turkey.
- The impact of mass tourism directed to the Mediterranean coastal zones, with an even greater demand of natural resources. The total number of visitors is estimated at around 150 million, exceeding the number of local inhabitants, more than a third of the world total of cross-border tourism.

[27] See Attané, I and Courbage, Y. (2001), "La démographie en Méditerranée. Situation et projections", Economica; Plan Bleu, (Les Fascicules du Plan Bleu n°11), Paris.

A coastal agglomeration resulting from intern inhabitant emigration from the interior areas towards coastal zones. *Photo RAC/SPA*

Country	Population 2000 (in thousands)	Estimated population in 2025 (in thousands)
Algeria	30,332	42,329
Egypt	66,007	94,895
Israel	5,851	7,861
Lebanon	3,206	4,147
Libya	6,038	8.832
Morocco	28,505	38,174
Syria	15,396	24,003
Tunisia	9,615	12,892
Turkey	65,627	87,303
Palest. Authority	3,150	6,072

Table 4. Projected population growth in some Mediterranean states

3.1.2. Poverty and economic disparity

Per capita income around the Mediterranean shows very great differences, and ranges from a few hundred euros to many thousands (see Table xx below). This is the result of various historical, political and social factors, whose relative weight is debatable. However, a sad realisation, according to predictions of the European Commission, is that the financial disparity in the region between the rich and the poor will continue to increase during the 21st century. This is a totally unacceptable premise, and must become a key concern, especially of the wealthier European Union member states.

Country	Population (2000)	Income per capita(in USD,1998)	Coastline
Albania	3,200,000	930	418 km
Bosnia and Herzegovina	3,972,000	NA	20 km
Croatia	4,473,000	4,620	5,790 km
Italy	57,456,00	20,000	7,100 km (in total)
Montenegro	650,000	NA	274 km
Slovenia	1,965,000	9,780	32 km

Table 5. Economic disparities in the Adriatic region

The serious element to be realised, without ignoring its moral and religious implications, is that this economic disparity is related to excessive population growth; and that it cannot be managed without a drastic decrease of the rates of such demographic growth.

3.2. Irreversible threats

Irreversible can be considered threats whose impacts cannot be restored except at geological scales of thousands of years. An urbanised area, for example, can be abandoned and it may return to a natural state in two or three millennia. Or destroyed forests might be re-established within a considerable number of centuries.

These large time scales signify that prevention is the only means to avert these threats, as restoration actions go beyond human possibilities.

3.2.1. Urbanisation and other land use changes

The large and growing population of the Mediterranean coastal zones is becoming more and more urbanised, with 50 coastal cities exceeding 100,000 inhabitants. Istanbul has a population which is estimated at 12 million and still growing rapidly, while Athens is around 4.5 million. The rate of urbanisation, which is currently 64.3%, will reach 72.5% by the year 2025, most of it in the South and East, where almost 100 million additional urban dwellers are estimated[28].

As a result, large parts of the coastal zone are now being rapidly converted from a natural or rural state to an urbanised one, through the construction of buildings and technical infrastructure, such as harbours[29], airports[30] and road networks[31]. Their result is the total destruction of valuable habitats, or at best their fragmentation.

3.2.2. Drainage

Since ancient times, human beings have attempted to drain wetlands in order to cultivate their fertile bottoms[32]. Large-scale interventions became possible only during the 20th century, with the mechanisation of construction of major public works. During that period, a considerable part of the wetlands of the Mediterranean was drained and cultivated, usually under intensive conditions. Near the end of the century, it started becoming apparent through bitter experience that sometimes drainage schemes were not successful and resulted in major problems, especially when compounded by the intensification of agriculture: loss of water supply, waterlogging of soils and flooding, dropping of aquifers, salinisation and eventual need of abandonment. The examples are many all around the Basin. This has led to a gradual stopping of drainage from agricultural purposes.

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[28] Population and urbanisation projections by the Plan Bleu.

[29] Required both for the intensification of fishing activities and for nautical tourism.

[30] Many of the airports in the Mediterranean are constructed within wetlands, such as the ones in Corfu, Larnaca, Marseille, Thessaloniki, Tunis.

[31] Very often built too close to the shoreline, as in some parts of Cyprus and Malta islands.

[32] The Minyans did manage to drain the large Copais Lake in Central Greece approximately four millennia ago.

On the other hand, wetlands are still being drained to provide space at no cost for the expansion of urban centres, tourist facilities and infrastructure projects (such as roads and airports). Perhaps the most characteristic example is the city of Tunis, which continues to expand by draining parts of the Bay of Tunis.

3.2.3. Erosion

Beach erosion, as well as erosion of sandy spits dividing lagoons from the sea, is a common problem in the region. To a large extent it is due to the straightening of rivers and torrents, thus increasing the speed of their flows and their impact on coastal currents, and the construction of dams, which retain silt and other materials necessary for the structural integrity of natural coastal elements. This explains the dramatic erosion of the Nile Delta, after the construction of the Aswan Dam, but also the shrinking of sandy beaches in many parts of Greece. In some countries (such as Lebanon and Morocco), excessive sand and pebble extraction from both beaches and river beds (especially torrents and oueds) plays an additional negative role.

A different problem is caused by deforestation, which allows erosion of slopes. After heavy rains, the silt transported by torrents is often deposited in lakes and wetlands and thus decreases their depth. Unless addressed, this problem may lead to a total drainage of some shallow water bodies.

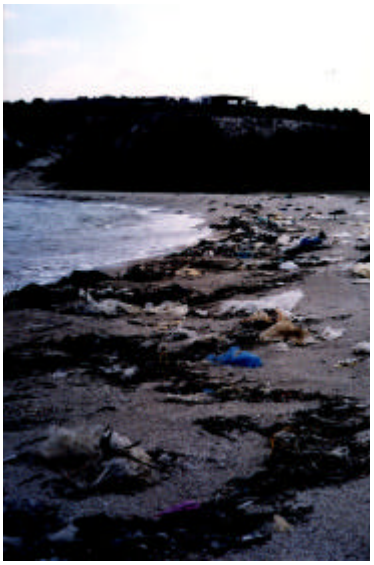
3.2.4. Climate change and sea level rise

Although it is just becoming visible in the region[33], climate change and the resulting sea level rise will certainly have a major impact, especially on coastal wetlands. This phenomenon, as convincingly documented by the International Panel on Climate Change (IPCC), is due to anthropic reasons and mainly to atmospheric pollution by the 'greenhouse gases'. Unfortunately, very little work has been done in studying its impact on coastal wetlands and systematic research is quite overdue. Especially as flora and fauna species from warmer climates (mainly the Red Sea) have started invading the Mediterranean and compounding the problems caused by exotic species.

3.3. Reversible threats

Reversible threats are those whose impacts can be remedied within a generation or two, once the initial cause is removed. Thus polluted waters, once the pollution source has been effectively curbed, may return to an acceptable state within a few decades. Bird populations suffering from excessive hunting will probably recover once the threat is mitigated. Sea bottoms and fish populations have been seen to improve rapidly in no-fishing zones.

[33] A good indicator is the dramatic increase of the days of flooding of St. Mark's Square in Venice.



3.3.1. Pollution

Pollution of the coastal zone and its wetlands by solid and liquid domestic and industrial by-products is reported as a major problem by many Mediterranean states, as the lack of appropriate treatment facilities is very common. In particular, chemical and petrochemical industries concentrated around major coastal cities are a major source of pollution[34]. To this is added now agricultural pollution from runoff containing high degrees of fertilisers, pesticides and other agrochemicals. Their combined impact on the health of habitats and on particular species is often quite high. It should be noted, however, that this is not an irreversible effect, and that after the removal of the sources of pollution biodiversity can be re-established to a considerable degree.

Photo D.Cébrian

3.3.2. Overexploitation of resources

Wetland resources are useful for the populations living around them for food, fibres and biomass. In some cases though, the overexploitation of these resources leads to their collapse. A characteristic example is fishing in coastal lakes and lagoons, where the use of finer nets and other methods has led to the dramatic decrease of catches. Similarly, excessive hunting of wetland and coastal birds has led to a great diminution of their populations, often beyond recovery levels. Overgrazing of coastal areas has also resulted in the complete disappearance of vegetation and subsequent erosion of the topsoil. Uncontrolled and excessive sand extraction from beaches and river beds for use in construction is a major problem in many countries, as it leads to the destruction of habitats, to erosion and to irreparable structural damage of natural formations.

The extensive pasture in the coastal zones also caused the total disappearance of the vegetation. *Photo MedWet*

[34] Typical cases are the cities of Algiers, Oran and Annaba in Algeria.

3.3.3. Water abduction and salinity changes

Population growth results in an increasing demand for freshwater. This is exacerbated by tourist consumption, which is usually much higher than the corresponding levels for local inhabitants. Agriculture has become a key competitor for freshwater resources, with a consumption exceeding 80% in some countries[35]. The utilisation of freshwater has exceeded in some countries the sustainable limit of 50% of available resources, while in Egypt and Israel it approaches 90%.

This demand has led to a dramatic mismanagement of freshwater resources. Lakes and other wetlands have been totally drained, rivers diverted, aquifers overexploited down to hundreds of meters, resulting in salination in the coastal areas. The examples are endless, with the latest one being the disappearance of Lake Coronia in Northeren Greece, a Ramsar site, due to excessive water abduction for irrigation purposes.

On the other hand, freshwater is necessary for the maintenance of biodiversity, particularly for wetland-related habitats and species. Wetlands in turn, when their functions are intact, play a major balancing role in the water cycle and their degradation contributes to water shortage, thus establishing a classical vicious circle.

The problem is compounded by the pollution of freshwater sources through wastewater and agricultural runoff, which seems to be an insoluble problem in many countries.

It is evident that measures will be necessary for the management of freshwater demand, with priority given to social and ecological uses, while economic uses will have to bear the full cost of the resource. Technical measures to limit the water required in agriculture and to minimise water losses in networks (especially in irrigation, which are often as high as 50%) will help in improving the situation. In this context, the conservation and wise use of wetlands cannot be dissociated from the management of water resources –on a hydrological basin level– and must be faced in an integrated and balanced manner.

[35] In Greece, for example, agricultural demand is estimated at 87% of the total water consumption.

4.

Conservation and wise use efforts

The efforts for the conservation of Mediterranean wetlands and for the wise use of their resources require actions at all levels –from national policies to concrete on-site management actions–, in which a variety of actors –from international organisations and central governments to local societies– must actively participate and contribute effectively.

4.1. National policies

4.1.1. Coastal and wetland policies

In recent years, a number of Mediterranean states have developed policies for the conservation and wise management of the coastal areas and of wetlands, led by pioneering work in France and Tunisia, while others (such as Greece and Turkey) have similar policies in preparation. It is clear, however, that significantly more work needs to be done by decision-makers on the policy level. The most difficult part, however, is the harmonisation of positive policies on biodiversity and the conservation and sustainable use of sensitive areas, with other sectoral ones, which –directly or indirectly– lead to the destruction of coastal and wetland habitats and consequently to the decrease of biodiversity.

Following policies, the corresponding legislation relative to coastal and wetland biodiversity is often weak or out of date, and needs modernisation and alignment. Often, however, the problem is not the lack of appropriate legislation, but the low degree of its implementation and enforcement. This is very evident in the increase of illegal construction along the Mediterranean coasts, in spite of legislation that strictly forbids it. Thus, implementation of existing laws and regulations is a key issue for the maintenance of biodiversity in the region.

4.1.2. Related policies (agriculture, fisheries, land use, tourism, trade, water)

Often the destruction or degradation of wetlands is not due to the lack of appropriate policies and legislation concerning them, but indirectly due to policies in other sectors that may cause secondary but strong impacts. Such sectors include general development, water resources, power production, agriculture and fisheries, trade and economic incentives and disincentives, which may affect wetlands in various negative ways. It is necessary, therefore, to have these policies carefully assessed in a holistic manner, so that negative provisions can be eliminated.

4.2. Management of wetlands

4.2.1. Responsibilities and jurisdiction

Throughout the Basin, there are many different ways of sharing responsibility for the coastal zones and wetlands within the public sector. In most cases, the responsibility resides with central ministries (usually of Environment or Agriculture), although Ministries of Irrigation are often involved[36]. Rarely, special bodies have been established for this task, with various degrees of autonomy[37]. On the local level, the government is often represented through Forestry Services, while in certain cases more specialised conservation and management bodies have been established for privileged sites. Unclear jurisdictions and overlapping responsibilities among public services are often recognised as a serious problem.

4.2.2. Management planning: Preparation and implementation

The many pressures and often conflicting uses in the coastal areas and wetlands make necessary an organised intervention for the allocation of resources and the conservation of the natural and cultural heritage. In many countries, it is considered through experience that this is best done through integrated coastal management (ICAM) plans, prepared by multi-disciplinary teams in close contact with local realities and conditions. Already appropriate methodology has been developed and considerable experience gained in the preparation of such management plans[38]. An international collaboration effort in reviewing management planning of sensitive coastal areas in the Mediterranean in view of streamlining their implementation would be highly useful. Additional work must be done in adapting the more general coastal plans to specific sites.

The information centres located inside or near of the areas to create play an important role in the implementation of the management plans. *Photo MedWet*

[36] As in the cases of Syria and Turkey.

[37] Such as the *Conservatoire du littoral* in France and the *Agence pour la protection et l'aménagement du littoral (APAL)* in Tunisia.

[38] Mainly through the Coastal Area Management Programme (CAMP) of the Mediterranean Action Programme, managed by PAP/RAC since 1989. For coastal wetlands similar work has been done through the MedWet1 and 2 and MedWetCoast projects since 1992. Also refer to the new Ramsar Guidelines (Res. VIII.14).

As in the case of legislation, the key issue remains the implementation of management plans. For especially significant areas it is best done through dedicated multidisciplinary bodies, located in or very near the area to be managed. Such bodies can play a key role in mediating disputes in the use of scarce resources, avoiding conflicts of activities, identifying and conserving the natural and cultural wealth of each area, and thus contribute effectively in the maintenance of biodiversity. To do this well they must develop close links with the local populations and the organisations that represent them. Unfortunately, very few protected areas in the region have the benefit of such structures.

4.3. Social control

4.3.1. Role of local authorities

Traditionally, the responsibility for the conservation of biodiversity lies with central government services, except in cases like Italy and Spain, where a degree of regional self-governing has been accepted. Local authorities did not appear to have any jurisdiction on this matter. Lately, however, the situation is changing, as it has been finally understood that the consensus of local stakeholders is a *sine qua non* for any successful conservation efforts. Local authorities, being direct representatives of local societies and being closer to voters, have in principle a better access to them and may be more able to reach such consensus.

This sharing of responsibilities among central services and local authorities is also being encouraged by the process of decentralisation, which is ongoing at least in the countries of the North of the Basin. The danger here lies in the fact that local authorities are invited to implement obligations under international conventions, signed by the central government, and of which they are poorly informed.

It is interesting to note that even in countries that remain centralised, effective nature conservation is carried out only in those that have entrusted it to ministries with strong local services with a continuous presence in the field (such as forestry).

4.3.2. Participation of local inhabitants

Time and time again, it has been demonstrated that the conservation of biodiversity cannot be maintained without the support of the people living in or around sensitive areas. Yet their traditional relationship with nature has been often severed by modern developments and their participation in conservation efforts is far from common. To gain social support it is necessary to convince people of the values of coastal zones and wetlands to them and of the need to use their resources in a sustainable manner. This is best done through the wetland management bodies, the local government organisations (municipalities and communities) and the NGOs. All three have a role to play in increasing public awareness and in creating a sense of pride for the natural and cultural heritage of each particular area.

4.3.3. The non-governmental organisations

Thus the role of non-governmental organisations (NGOs), which represent civic society, is growing in almost all Mediterranean states. Initially, there was a degree of

reluctance from the side of governments in accepting them. Lately, however, it has been demonstrated that their activities are useful both directly in pinpointing and sometimes stopping destructive projects or activities, and indirectly in their ability to mobilise local societies in favour of biodiversity conservation and sustainable use. That is why they are becoming a noticeable and worthy stakeholder in issues of biodiversity and must be taken seriously into account on both the practical and the strategic level.

4.4. International co-operation

The Mediterranean states have a high degree of participation in international conventions concerned with biodiversity. All of them participate in the Barcelona Convention and the Convention on Wetlands, and many of them in the Convention on Biological Diversity, as well as the Bern and Bonn Conventions, and CITES. However, their degree of substantial involvement in the work of these conventions is not equal; for a few states this participation remains a matter of form and must take a more active turn.

It should be noted here that participation in such agreements entails a number of responsibilities. In some agreements, these responsibilities are legally binding, while in others they have a moral dimension only. In both cases, peer pressure among participating countries is a strong motivation for positive action that should not be ignored.

The more affluent countries of the North of the Basin maintain bilateral co-operation agreements with those of the South and East. Such agreements often include both financial and technical aid for the conservation of biodiversity. They provide very valuable (albeit limited) resources. There is the need, however, to have these resources increased considerably in the coming years, so that they become commensurate with the needs and to have them targeted on capacity building in the developing countries of the region. From the side of the recipient countries, it is necessary that they request funding for biodiversity-related projects and not only for development-oriented ones.

4.4.1. The Barcelona Convention and MAP

UNEP has launched in the mid-1970s its Regional Seas Programme. The first one was the Mediterranean Action Plan (MAP). Its legal entity is the Barcelona Convention signed by 20 states and the European Commission. These contracting parties decide on MAP policies, budget and programme, within the wider MAP goal of a better environment in the framework of sustainable development.

There are six Protocols, which form legally binding documents of the Barcelona Convention. Among them is the one on Specially Protected Areas and Biodiversity Protocol of 1995, which replaced the SPA Protocol of 1982, and is of particular concern for wetland conservation.

The structure of UNEP/MAP includes the MAP Coordinating Unit (MEDU) in Athens, the Mediterranean Commission on Sustainable Development (MCSD), six Regional Activities centres, as well as the MED POL Programme for the Assessment and Control of Pollution and the Programme for the Protection of Historic Sites.

The mandate of MAP has been expanding since its establishment more than 25 years ago. Initially it was mainly concerned with marine pollution and biodiversity. Gradually it expanded to cover a wide variety of environmental and socio-economic issues, including sustainable development, as well as the conservation of coastal zones and wetlands. Among its noble priorities is 'Strengthening solidarity among Mediterranean coastal states in managing their common heritage and resources for the benefit of the present and future generations'. MAP faces a number of difficulties such as the necessity to obtain consensus on every issue, budgetary constraints, and the cumbersome procedures of the UN system.

4.4.2. The Convention on Wetlands (Ramsar, 1971)

The Convention on Wetlands has its origin probably in the MAR initiative in the early 1960s. In 1947 the International Council for Bird Preservation (ICBP, now BirdLife International) created a section to promote research on waterfowl and their habitats, which soon became independent and became known as the International Waterfowl research Bureau (IWRB, now wetlands International). Thus in 1962, at the initiative of IWRB and its director Luc Hoffmann, and the assistance of ICBP and IUCN, the MAR Conference was convened in the Camargue, followed in 1965 by a first list of European and North African wetlands, and in 1967 by the IWRB mid-winter waterfowl counts, which provided the necessary scientific basis for an international convention on wetland conservation, whose need had been identified during the MAR Conference.

Draft texts for such a convention had been prepared as early as 1964 and had been debated in a number of international meetings. Thus a final text was proposed and adopted at the 1971 conference in Ramsar, Iran for the establishment of a 'Convention on Wetlands of International Importance especially as Waterfowl Habitats'. The Convention came into effect on 21 December 1975 four months after the accession of its seventh contracting party. Today the Convention numbers 136 member states.

Since 1975, the focus of the Convention has been enlarged to include other wetland species, besides waterfowl, such as fish and invertebrates. Its concerns grew through the concept of 'wise use' of wetlands, which became synonymous with 'sustainable use', once this second term became widely adopted, bringing people as a major element in wetlands. Thus the socio-economic aspects of wetlands, including the management of wetland resources, became closer to the mainstream of the Convention.

During its last COP in November 2002, the Convention made two new innovative steps. It adopted resolutions on:

- taking into account cultural values in the management of wetlands;
- promoting the regionalisation of the Convention on the basis of the MedWet experience.

It is hoped that under its new leadership[39], the Ramsar Convention will continue to champion the cause of wetlands for the people in the Mediterranean.

[39] Peter Bridgewater, replaces Delmar Blasco as secretary General of the Convention in August 2003.

4.4.3. Other related multilateral agreements

The **Convention on Biological Diversity** (CBD) maintains a close collaboration with the Convention on Wetlands, through an MoC. Thus, all the activities of CBD concerning wetlands are channelled through Ramsar or are carried out in close collaboration with it. This has proven to be a very successful collaboration, avoiding duplication of efforts and creating considerable synergy.

The **Convention Concerning the Protection of the World Cultural and Natural Heritage** was approved by the General Council of UNESCO in 1972 and has today more than 175 members. According to the Convention, 'cultural heritage' is a monument, group of buildings or site of historical, aesthetic, archaeological, scientific, ethnological or anthropological value. 'Natural heritage' designates outstanding physical, biological, and geological features; habitats of threatened plants or animal species and areas of value on scientific or aesthetic grounds or from the point of view of conservation.

The mission of the World Heritage Convention is to:

- encourage countries to sign the Convention and ensure the protection of their own natural and cultural heritage;
- encourage States Parties to the Convention to nominate sites within their national territory for inclusion on the World Heritage List.

It is evident that the work of this Convention is pertinent to wetlands. Yet in the Mediterranean few wetland sites have been classified under it and they include:

- Butrint, Albania (1992, 1999)
- Srebarna Nature Reserve, Bulgaria (1983)
- Plitvlice Lakes National Park, Croatia (1979, 2000)
- Ohrid Region, FYR of Macedonia (1979)
- Doñana National Park, Spain (1994)
- Ichkeul National Park, Tunisia (1980)

The collaboration between the World Heritage Convention and Ramsar has not been too active as yet, but it is certain that it will rapidly improve.

On the other hand, a Memorandum of Collaboration has been signed between UNESCO's **Man and the Biosphere Programme** (MAB) and the Convention on Wetlands for strengthening the collaboration on joint sites. It provides for information exchanges and a very concrete and detailed joint programme of work. This will become much more important now, due to the implementation of Ramsar COP8 Resolution VIII.19 on the cultural aspects of wetlands.

MAB and Ramsar maintain since 2 February 2001 (World Wetlands Day) a common web site at www.unesco.org/mab/ramsarmab.

Besides the above, there are a number of other international conventions, organisations and/or agreements of importance for Mediterranean wetlands, with which efforts of collaboration are proceeding. These include:

- The Convention on International Trade in Endangered Species – CITES.
- The Convention on Desertification.
- The UN Framework Convention on Climate Change.

- The Convention on the Conservation of Migratory Species of Wild animals (Bonn Convention, 1988).
- The African Eurasian Waterbird Agreement – AEWA[40], under the Bonn Convention (1995).
- IUCN, The World Conservation Union, which has recently established an Office for Mediterranean Collaboration in Malaga, Spain.
- Birdlife International and Wetlands International. The second has not been very active in the region during the last few years for policy and administrative reasons.
- The WWF Mediterranean Programme Office in Rome, which just appointed its first Freshwater Officer.

4.4.4. The Euro-Med Partnership and SMAP

The European Union has at times shown considerable interest in the Mediterranean Region, although it has been criticised as insufficient and not persistent enough, in addressing the economic inequalities and other social and development problems in this sensitive region. One of its major initiatives has been the signing of the Euro-Med Partnership and the Barcelona declaration in November 1995. Two years later, in November 1997, the Commission was entrusted with the co-ordination of the Short and Medium-Term Priority Environmental Action Programme (SMAP).

The Short and Medium-term Priority Environmental Action Programme (SMAP) is a framework programme of action for the protection of the mediterranean environment, within the context of the Euro-Mediterranean Partnership. It was adopted unanimously by the Euro-Mediterranean Ministerial Conference on the Environment, held in Helsinki on the 28 November 1997.

The SMAP is the common basis for environmental purposes (as regards both policy orientation and funding) in the Mediterranean region. Therefore, it is understood that :

- efforts need to be concentrated at both national and regional levels;
- coherence and synergies need to be ensured with existing multilateral programmes and legal instruments, while respecting the specificity of each forum;
- chances to attract more funding for the environment in the region need to be increased while optimising use of the existing ones;
- transparency and broad public support of the SMAP, including from civil society, need to be secured in view of ensuring its full implementation;

The Partners have selected by consensus the following five priority fields of action for the SMAP:

(a) Integrated water management, which includes
'Protection of water reservoirs and wetlands and where appropriate establishment of river basin and catchment area management plans'.

(b) Waste management,.

(c) 'Hot spots' (covering both polluted areas and threatened biodiversity elements), under which the following are included:
'Setting up and implementation of management plans, pilot projects and demonstration actions, including appropriate institutional and organisational

[40] Which aims to create a legal basis for a concerted conservation and management policy by the range states for migratory waterbird species.

arrangements, to secure the future of the most valuable and threatened natural resources; priority will be given to ecosystems and notably wetlands of Mediterranean or even international importance, to areas designated within international agreements for the protection of species in the Mediterranean region and to the protection of vulnerable biodiversity elements'.

'Development and implementation of pilot projects and demonstration actions for the sustainable use and management of biodiversity and of natural resources.'

(d) Integrated coastal zone management, which mentions:
'Development and implementation of plans for the conservation and management of Mediterranean biodiversity, with special emphasis on coastal ecosystems including where appropriate the protection of threatened marine species, as well as support to environmentally sound initiatives of Fisheries Ministers'.

(e) Combatting desertification.

The SMAP also provides for a follow-up mechanism, including :

- a Network of SMAP correspondents, to meet annually;
- a reporting system;
- a review mechanism, after two years, which might lead to adjustments of the programme if needed, to be adopted at ministerial level;
- consultation practices, also involving the civil society, for the implementation of the SMAP and its eventual modifications.

The MEDA instrument could become an important catalyst in implementing the SMAP and protecting the Mediterranean environment. According to its regulation, 90% of the funds go to national projects and only 10% to regional ones. The European Investment Bank is also ready and willing to participate. Other donors (public and private) should join in and be mobilised in the same direction, as well. Active participation at all levels, including the NGOs, is considered indispensable to ensure successful implementation of this common exercise.

In spite of all these positive elements, and as far as wetlands are concerned, there have been very few actions promoted and funded through the the SMAP and MEDA. One of the reasons for this is that the total amount of available funds has been quite limited, and that it was absorbed –at the request of the beneficiary countries– in other priorities and not on biodiversity issues. The European Commision as well did not play an active role in a more equitable distribution of these funds.

CONCLUSIONS

Summarising the situation

The situation of wetland biodiversity in the Mediterranean is a typical case of the glass being half-full or half-empty. On the one hand, the region still contains a considerable number of valuable habitats and of species, which include a high number of threatened and endemic ones. So its biological richness on a global scale –much of it in wetland ecosystems and wetland-dependent species– cannot be doubted.

On the other, there have been dramatic losses, during the last few decades, and they are continuing unabated, in spite of the positive efforts 'to stop and reverse the loss and degradation of Mediterranean wetlands'. It has been also noted that the loss of biodiversity, especially –but not only– in wetlands cannot be stopped until its root causes are effectively addressed. That is why wetland biodiversity conservation is not solely a technical or scientific issue, but pertains to a high level of development policies within the framework of the sustainable management of resources.

Trends in the beginning of the 21st century

Thus, in the beginning of the third millennium, still increasing anthropic pressures on the coastal areas is the key issue concerning biodiversity in the Mediterranean. In spite of timid stabilisation trends in population growth in the South and East of the Basin, internal and external migration, mass tourism and increasing per capita incomes in some of the countries are all factors that will continue to fuel these pressures. A future in which the entire coastline of the Mediterranean will be fully artificialised and urbanised is not unimaginable at this stage.

Unfortunately, exorbitant consumption demands of stable and ageing populations in the more affluent countries of the region, combined with the survival needs of booming and young populations in the developing countries, will continue to create an unsustainable framework, within which the conservation of the natural and cultural heritage of coasts and wetlands appears almost impossible.

It is imperative, therefore, to engage decision-makers at the local, national and transnational levels, and convince them of:

- the need to implement sustainability, which cannot be achieved without a control of consumption and population growth and an equitable development in the region, without extremes in income distribution;
- the values of biodiversity, not only on the abstract scientific level, but for the benefit of local populations in the region.

The fact that the SAP BIO project has been approved by the Barcelona Convention, and is proceeding with the participation of 17 states in the region, is perhaps an indication that at least this second message has been understood, albeit on a theoretical level.

It would not be possible, however, to change the attitudes of decision-makers in such crucial issues, and in all Mediterranean societies, without the sensitisation of the wider public, and especially of local populations, and a beginning of understanding and acceptance of the values of biodiversity. Therefore, activities with those goals must be given a high priority. In many countries, the attitude of people towards the

natural heritage is slowly improving, and this trend needs to be encouraged and reinforced.

In parallel, the knowledge of the distribution of biodiversity in the region is a prerequisite. Inventorying and mapping critical species and habitats will be necessary, so that conservation efforts are focused carefully and the limited resources available are distributed efficiently and effectively. This is an area in which international collaboration, co-ordinated by the RAC/SPA, can make available consistent methods and tools. In turn, the results produced through them will be comparable from country to country and will give a unified and integrated view of biodiversity in the entire Mediterranean Basin.

Monitoring trends and the impact of conservation efforts must be also considered of great importance, both in order to allow evaluation and corrective measures, and as a tool of sensitisation of decision-makers and the public.

Specific management actions on the site level will be required, so that destructive human activities can be counterbalanced with positive management measures and a satisfactory balanced established. An essential part of this balance will be ensuring that wetland resources –and especially space and water– are used in a sustainable manner, without impairing the functions of these rich ecosystems, so that they continue to provide values now and in the future.

In all these efforts, international collaboration should not be neglected. If developed in an equitable and generous framework, it will allow a sharing of scientific knowledge, technical experience, and resources –both human and financial. In addition, through peer pressure, it may create eventually a proper climate for positive change on the political and policy level.

Selected bibliography

Benessaiah, N. (1998), *Mediterranean wetlands: Socio-economic aspects*, Ramsar Convention Bureau – MedWet, Tunis.

Morillo, C. and Gonzalez, A.C. (1996), *Management of Mediterranean wetlands,* Ministerio de Medio Ambiente, Spain and MedWet, Madrid.

Papayannis, T. and Salathé, T. (1999), *Mediterranean wetlands at the dawn of the 21st century*, MedWet – Tour du Valat Publications, Arles, France.

Papayannis, T. (2002), *Regional action for wetlands: The Mediterranean experience*, MedWet – Tour du Valat Publication, Arles, France.

Pearce, F. and Crivelli, A.J. (1994), *Characteristics of Mediterranean wetlands*, MedWet – Tour du Valat Publications, Arles, France.

Salathé, T. (1992), *Towards integrated management of coastal wetlands of Mediterranean type*, European Commission, Document XI/669/92, Brussels.

Skinner, J. and Zalewski, S. (1995), *Functions and values of Mediterranean wetlands*, MedWet – Tour du Valat Publications, Arles, France.

Zalidis, G.C., Crisman, T.L. and Gerakis, P.A. (eds.) (2002), *Restoration of Mediterranean wetlands*, Hellenic Ministry of Environment, Physical Planning and Public Works, Athens and Greek Biotope/Wetland Centre, Thermi, Greece.

Viñals, M.J. (co-ord.) (2002), *El patrimonio cultural de los humedales / Wetland cultural heritage*, Ministerio de Medio Ambiente, Madrid, Spain, 272 pp.

Appendix I: Ramsar sites in countries members of the Mediterranean Wetlands Committee

	Ssite	*Date of designation*	*region, province, state*	*Aarea*	*Co-ordinates*	*Comments*
ALBANIA						
*	Karavasta Lagoon	*29/11/95*		20,000 ha	41º00'N 019º30'E	
*	Butrint	(announced)				WHS[1], at Ramsar COP8
ALGERIA						
*	Chott Ech Chergui	*02/02/01*	Saïda	855,500 ha	34º27'N 000º50'E	
*	Chott El Hodna	*02/02/01*	M'Sila, Batna	362,000 ha	35º18'N 004º40'E	
*	Chott Merrouane et Oued Khrouf	*02/02/01*	El Oued	337,700 ha	33º55'N 006º10'E	
*	Complexe de zones humides de la plaine de Guerbes-Sanhadja	*02/02/01*	Skikda, El Tarf	42,100 ha	36º53'N 007º16'E	
*	La Vallée d'Iherir	*02/02/01*	Illizi	6,500 ha	25º24'N 008º25'E	
*	Lac des Oiseaux, ou Garaet et Touyour	*22/03/99*	El Kala	70 ha	36º47'N 008º07'E	
*	Lac Oubeïra	*04/11/83*	El Tarf	2,200 ha	36º50'N 008º23'E	MAB[2]
*	Lac Tonga ***MR*** [3]	*04/11/83*	El Tarf	2,700 ha	36º53'N 008º31'E	MAB
*	Les Gueltates d'Issakarassene	*02/02/01*	Tamanrasset	35,100 ha	22º25'N 005º45'E	
*	Marais de la Macta	*02/02/01*	Mascara, Mostaganem, Oran	44,500 ha	35º41'N 000º10'W	
*	Oasis de Ouled Saïd ***MR***	*02/02/01*	Adrar	25,400 ha	29º24'N 000º18'E	
*	Oasis de Tamantit et Sid Ahmed Timmi	*02/02/01*	Adrar	95,700 ha	27º45'N 000º15'E	
*	Sebkha d'Oran	*02/02/01*	Oran	56,870 ha	35º22'N 000º48'W	
BOSNIA AND HERZEGOVINA						
*	Hutovo Blato	*24/09/01*		7,411 ha	43°03'N 017°37'E	
BULGARIA						
*	Atanasovo Lake	*28/11/84*	Burgas	1,404 ha	42º34'N 027º28'E	
*	Belene Islands Complex	*24/09/02*	Pleven	6,898 ha	43°40'N 025°11'E	
*	Durankulak Lake ***MR***	*28/11/84*	Varna	350 ha	43º42'N 028º30'E	
*	Ibisha Island	*24/09/02*	Montana	372 ha	43°49'N 023°31'E	

1 WHS: World Heritage Site.

2 MAB: Man and the Biospgere Reseve.

3 **MR**: sites included in the **Montreux Record**, "a record of Ramsar sites where changes in ecological character have occurred, are occurring or are likely to occur" maintained by the Bureau in consultation with the Contracting Party concerned (Recommendation 4.8, 4th COP, Montreux, Switzerland).

*	Lake Shabla	*19/03/96*		404	ha	43º35'N 028º33'E	
*	Poda	*24/09/02*	Burgas	307	ha	42°27'N 027°27'E	
*	Pomorie Wetland Complex	*24/09/02*	Burgas	814	ha	42°35'N 027°37'E	
*	Ropotamo Complex	*24/09/75*	Burgas	5,500	ha	42º19'N 027º45'E	
*	Srebarna ***MR***	*24/09/75*	Silistra	1,357	ha	44º07'N 027º05'E	WHS, MAB
*	Vaya Lake	*11/11/02*	Burgas	2,900	ha	42°30'N 027°25'E	
CROATIA							
*	Crna Mlaka	*03/02/93*		625	ha	45º37'N 015º44'E	
*	Delta Neretve	*03/02/93*		11,500	ha	42º57'N 017º34'E	
*	Kopacki Rit ***MR***	*03/02/93*		17,770	ha	45º35'N 018º51'E	
*	Lonjsko Polje & Mokro Polje (incl. Krapje Djol)	*03/02/93*		50,560	ha	45º30'N 017º00'E	
CYPRUS							
*	Larnaca Salt Lake	*11/07/01*		1,585	ha	34°52'N 033°33'E	
EGYPT							
*	Lake Bardawil ***MR***	*09/09/88*		59,500	ha	31º05'N 033º05'E	
*	Lake Burullus ***MR***	*09/09/88*	Kafr El Sheikh	46,200	ha	31º30'N 030º50'E	
FRANCE							
*	Baie de Somme	*30/01/98*	Picardie	17,000	ha	50º14'N 001º33'E	
*	Baie du Mont Saint-Michel	*14/10/94*	Basse-Normandie, Bretagne	62,000	ha	48º40'N 001º40'W	
*	Basses Vallées Angevines	*01/02/95*	Pays de la Loire	6,450	ha	47º34'N 000º28'W	
*	Bassin du Drugeon	*02/02/03*	Franche-Comté	5,988	ha	46°50'N 006°10'E	
*	Camargue	*01/12/86*	Provence-Alpes-Côte d'Azur	85,000	ha	43º30'N 004º30'E	MAB
*	Etang de Biguglia	*08/04/91*	Corse	2,000	ha	42º36'N 009º29'E	
*	Etangs de la Champagne humide	*08/04/91*	Champagne-Ardenne	135,000	ha	48º35'N 004º45'E	
*	Etangs de la Petite Woëvre	*08/04/91*	Lorraine	5,300	ha	49º02'N 005º48'E	
	Etangs du Lindre, forêt du Romersberg et zones voisines	*02/02/03*	Lorraine	5,308	ha	48°47'N 006°48'E	
*	Golfe du Morbihan	*08/04/91*	Bretagne	23,000	ha	47º35'N 002º47'W	
*	Grande Briere	*01/02/95*	Pays de la Loire	19,000	ha	47º22'N 002º10'W	
*	La Brenne	*08/04/91*	Centre	140,000	ha	46º44'N 001º15'E	
*	Lac de Grand-Lieu	*01/02/95*	Pays de la Loire	6,300	ha	47º05'N 001º40'W	
*	Lac du Bourget – Marais de Chautagne	*02/02/03*	Rhône-Alpes	5,500	ha	45°44'N 005°51'E	
*	Marais du Cotentin et du Bessin, Baie des Veys	*08/04/91*	Basse-Normandie	32,500	ha	49º23'N 001º10'W	

*	Marais du Fier d'Ars	*02/02/03*	Poitou-Charentes	4,452	ha	46°13'N 001°28'W	
*	Marais salants de Guérande et du Més	*01/09/95*	Pays de la Loire	5,200	ha	47°20'N 002°30'W	
*	La Petite Camargue	*08/01/96*	Languedoc-Rousillon	37,000	ha	43°30'N 004°15'E	
*	Rives du Lac Léman	*08/04/91*	Rhône-Alpes	3,335	ha	46°23'N 006°28'E	
GREECE							
*	Amvrakikos gulf ***MR***	*21/08/75*	Aitoloakarnania, Preveza, Arta	23,649	ha	39°06'N 020°55'E	
*	Artificial lake Kerkini	*21/08/75*	Serres	10,996	ha	41°13'N 023°08'E	
*	Axios, Loudias, Aliakmon delta ***MR***	*21/08/75*	Thessaloniki, Imanthia, Piera	11,808	ha	40°30'N 022°43'E	
*	Evros delta	*21/08/75*	Evros	9,267	ha	40°50'N 026°04'E	
*	Kotychi lagoons ***MR***	*21/08/75*	Ileia	6,302	ha	38°01'N 021°17'E	
*	Lake Mikri Prespa	*21/08/75*	Florina	5,078	ha	40°46'N 021°05'E	
*	Lake Vistonis, Porto Lagos, Lake Ismaris & adjoining lagoons ***MR***	*21/08/75*	Rodopi, Xanthi	24,396	ha	41°03'N 025°11'E	
*	Lakes Volvi & Koronia ***MR***	*21/08/75*	Thessaloniki	16,388	ha	40°41'N 023°20'E	
*	Messolonghi lagoons ***MR***	*21/08/75*	Aitoloakarnania	33,687	ha	38°20'N 021°15'E	
*	Nestos delta & adjoining lagoons ***MR***	*21/08/75*	Xanthi	21,930	ha	40°54'N 024°47'E	
ISRAEL							
*	En Afeq Nature Reserve	*12/11/96*		66	ha	32°51'N 035°05'E	
*	Hula Nature Reserve	*12/11/96*		300	ha	33°04'N 035°35'E	
ITALY							
*	Bacino dell'Angitola	11/04/89	Calabria	875	ha	38°44'N 016°14'E	
*	Biviere di Gela	12/04/88	Sicilia	256	ha	37°01'N 014°20'E	
*	Isola Boscone	11/04/89	Lombardia	201	ha	45°03'N 011°14'E	
*	Lago dei Monaci	14/12/76	Lazio	94	ha	41°22'N 012°55'E	
*	Lago di Barrea	14/12/76	Abruzzo	303	ha	41°46'N 013°58'E	
*	Lago di Burano	14/12/76	Toscana	410	ha	42°24'N 011°23'E	
*	Lago di Caprolace	14/12/76	Lazio	229	ha	41°20'N 012°58'E	
*	Lago di Fogliano	14/12/76	Lazio	395	ha	41°23'N 012°54'E	
*	Lago di Nazzano	14/12/76	Lazio	265	ha	42°12'N 012°36'E	
*	Lago di Sabaudia	14/12/76	Lazio	1,474	ha	41°16'N 013°01'E	
*	Lago di Tovel	19/09/80	Trentino Alto Adige	37	ha	46°16'N 010°57'E	
*	Laguna di Marano: Foci dello Stella	14/05/79	Friuli-Venezia Giulia	1,400	ha	45°44'N 013°08'E	
*	Laguna di Orbetello	14/12/76	Toscana	887	ha	42°27'N 011°13'E	
*	Laguna di Venezia: Valle Averto	11/04/89	Veneto	500	ha	45°21'N 012°09'E	

*	Le Cesine	06/12/77	Puglia	620	ha	40º20'N 018º21'E	
*	Ortazzo e Ortazzino	04/09/81	Emilia Romagna	440	ha	44º20'N 012º19'E	
*	Palude Brabbia	05/12/84	Lombardia	459	ha	45º44'N 008º40'E	
*	Palude della Diaccia Botrona	22/05/91	Toscana	2,500	ha	42º48'N 010º57'E	
*	Palude di Bolgheri	14/12/76	Toscana	518	ha	43º13'N 010º33'E	
*	Palude di Colfiorito	14/12/76	Umbria	157	ha	43º01'N 012º53'E	
*	Palude di Ostiglia	05/12/84	Lombardia	123	ha	45º04'N 011º06'E	
*	Piallassa della Baiona e Risega	04/09/81	Emilia Romagna	1,630	ha	44º30'N 012º15'E	
*	Pian di Spagna-Lago di Mezzola	14/12/76	Lombardia	1,740	ha	46º13'N 009º26'E	
*	Punte Alberete	14/12/76	Emilia Romagna	480	ha	44º31'N 012º14'E	
*	Sacca di Belócchio	14/12/76	Emilia Romagna	223	ha	44º37'N 012º16'E	
*	Saline di Cervia	04/09/81	Emilia Romagna	785	ha	44º15'N 012º20'E	
*	Saline di Margherita di Savoia	02/08/79	Puglia	3,871	ha	41º24'N 016º04'E	
*	Stagno di Cábras	28/03/79	Sardegna	3,575	ha	39º57'N 008º29'E	
*	Stagno di Cagliari ***MR***	14/12/76	Sardegna	3,466	ha	39º13'N 009º03'E	
*	Stagno di Corru S'Ittiri, Stagni di San Giovanni e Marceddì	28/03/79	Sardegna	2,610	ha	39º44'N 008º30'E	
*	Stagno di Mistras	03/05/82	Sardegna	680	ha	39º54'N 008º28'E	
*	Stagno di Molentargius ***MR***	14/12/76	Sardegna	1,401	ha	39º14'N 009º09'E	
*	Stagno di Pauli Maiori	28/03/79	Sardegna	287	ha	39º52'N 008º37'E	
*	Stagno di S'Ena Arrubia	14/12/76	Sardegna	223	ha	39º50'N 008º34'E	
*	Stagno di Sale Porcus	03/05/82	Sardegna	330	ha	40º01'N 008º21'E	
*	Torbiere d'Iseo	05/12/84	Lombardia	325	ha	45º38'N 010º02'E	
*	Torre Guaceto	21/07/81	Puglia	940	ha	40º43'N 017º48'E	
*	Valle Bertuzzi	04/09/81	Emilia Romagna	3,100	ha	44º47'N 012º14'E	
*	Valle Campotto e Bassarone	28/03/79	Emilia Romagna	1,363	ha	44º35'N 011º50'E	
*	Valle Cavanata	10/03/78	Friuli-Venezia Giulia	243	ha	45º43'N 013º28'E	
*	Valle di Gorino	04/09/81	Emilia Romagna	1,330	ha	44º48'N 012º21'E	
*	Valle Santa	14/12/76	Emilia Romagna	261	ha	44º33'N 011º50'E	
*	Valli del Mincio	05/12/84	Lombardia	1,082	ha	45º10'N 010º42'E	
*	Valli residue del comprensorio di Comacchio	04/09/81	Emilia Romagna	13,500	ha	44º37'N 012º11'E	
*	Vendicari	11/04/89	Sicilia	1,450	ha	36º48'N 015º07'E	
*	Vincheto di Cellarda	14/12/76	Veneto	99	ha	46º01'N 011º58'E	
LEBANON							
*	Ammiq Wetlands	*16/04/99*		280?	ha		
*	Deir el Nouriyeh cliffs of Ras Chekaa	*16/04/99*					
*	Palm Islands Nature Reserve	*03/08/01*	Tripoli	415	ha	34°30'N 035°46'E	
*	Tyre Beach	*16/04/99*		380	ha		

LIBYAN ARAB JAMAHIRIYA						
*	Ain Elshakika	*05/04/00*			32°46'N 021°21'E	
*	Ain Elzarga	*05/04/00*			32°47'N 022°21'E	
MALTA						
*	Ghadira	*30/09/88*		11 ha	35°58'N 014°21'E	
*	Is-Simar	*29/01/96*		5 ha	35°57'N 014°23'E	
MONACO						
*	Réserve sous-marine du Larvotto et zone					
	côtière du Portier	*20/08/97*		10 ha	43°44'N 007°26'E	
MOROCCO						
*	Baie de Khnifiss	*20/06/80*	Tan Tan	6,500 ha	28°00'N 012°15'W	
*	Lac d'Afennourir	*20/06/80*	Ifrane	250 ha	33°15'N 005°15'W	
*	Merja Sidi Boughaba	*20/06/80*	Kénitra	600 ha	34°15'N 006°40'W	
*	Merja Zerga	*20/06/80*	Kénitra	7,000 ha	34°50'N 006°20'W	
PORTUGAL						
*	Estuário do Tejo	*24/11/80*	Regiao Lisboa e Vale do Tejo	14,563 ha	38°50'N 008°57'W	
*	Estuário do Sado	*08/05/96*	Regiao Alentejo	25,588 ha	38°27'N 008°43'W	
*	Lagoa de Albufeira	*08/05/96*	Regiao Lisboa e Vale do Tejo	1,995 ha	38°30'N 009°10'W	
*	Lagoa de St. André et Lagoa de Sancha	*08/05/96*	Regiao Alentejo	2,638 ha	38°03'N 008°48'W	
*	Paúl de Arzila	*08/05/96*	Regiao Centro	585 ha	40°40'N 008°33'W	
*	Paúl de Boquilobo	*08/05/96*	Regiao Lisboa e Vale do Tejo	529 ha	39°23'N 008°32'W	MAB
*	Paúl de Madriz (Bas Mondego)	*08/05/96*	Regiao Centro	226 ha	40°08'N 008°38'W	
*	Paúl de Tornada (Tornada Marsh)	*24/10/01*	Regiao Lisboa e Vale do Tejo	50 ha	39°27'N 009°03'W	
*	Paúl do Taipal (Taipal Marsh)	*24/10/01*	Regiao Centro	233 ha	40°11'N 008°41'W	
*	Ria de Alvor	*08/05/96*	Regiao Algarve	1,454 ha	37°08'N 008°37'W	
*	Ria Formosa	*24/11/80*	Regiao Algarve	16,000 ha	37°03'N 007°47'W	
*	Sapais de Castro Marim	*08/05/96*	Regiao Algarve	2,235 ha	37°12'N 007°26'W	
SERBIA AND MONTENEGRO						
*	Ludasko Lake	*28/03/77*	Vojvodina	593 ha	46°04'N 019°48'E	

*	Obedska Bara	*28/03/77*	Vojvodina	17,501	ha	44º44'N 020º00'E	
*	Skadarsko Jezero	*15/12/95*	Montenegro	20,000	ha	42º12'N 019º17'E	
*	Stari Begej/Carska Bara Special Nature Reserve	*25/03/96*	Republic of Serbia	1,767	ha	45º15'N 020º23'E	
SLOVENIA							
*	Secoveljske soline (Secovlje salt pans)	*03/02/93*		650	ha	45º29'N 013º36'E	
*	Skocjanske Jame (Skocjan Caves)	*21/05/99*		305	ha	45º40'N 014º00'E	
SPAIN							
*	Aiguamolls de l'Empordà	*26/03/93*	Cataluña	4,784	ha	42º14'N 003º06'E	
*	Albufera de Adra	*04/10/94*	Andalucía	75	ha	36º45'N 002º57'W	
*	Albufera de Valencia	*05/12/89*	Comunidad Valenciana	21,000	ha	39º20'N 000º21'W	
*	Bahía de Cádiz	*24/10/02*	Andalucía	10,000	ha	36°30'N 006°11'W	
*	Colas del Embalse de Ullibarri	*24/10/02*	País Vasco	397	ha	42°54'N 002°33'W	
*	Complejo de Corrubedo	*26/03/93*	Galicia	550	ha	42º33'N 009º02'W	
*	Complejo intermareal Umia-Grove	*05/12/89*	Galicia	2,561	ha	42º28'N 008º50'W	
*	Complejo lagunar de La Albuera	*20/12/02*	Extremadura	1,878	ha	38°42'N 006°46'W	
*	Delta del Ebro	*26/03/93*	Cataluña	7,736	ha	40º43'N 000º44'E	
*	Embalse de las Cañas	*18/11/96*	Navarra	101	ha	42º29'N 002º24'W	
*	Embalse de Orellana	*26/03/93*	Extremadura	5,500	ha	38º59'N 005º32'W	
*	Embalses de Cordobilla y Malpasillo	*04/10/94*	Andalucía	1,972	ha	37º19'N 004º40'W	
*	Lago de Banyoles	*20/12/02*	Cataluña	1,033	ha	42°08'N 002°46'E	
*	Lago de Caicedo-Yuso y Salinas de Añana	*24/10/02*	País Vasco	26	ha	42°48'N 002°59'W	
*	Laguna de Chiprana	*07/06/94*	Aragón	162	ha	41º13'N 000º12'W	
*	Laguna de El Hito	*20/12/02*	Castilla-La Mancha	573	ha	39°52'N 002°41'W	
*	Laguna de Fuente de Piedra	*08/08/83*	Andalucía	1,364	ha	37º07'N 004º46'W	
*	Laguna de Gallocanta	*07/06/94*	Aragón	6,720	ha	40º58'N 001º33'W	
*	Laguna de la Nava de Fuentes	*24/10/02*	Castilla y León	307	ha	42°04'N 004°45'W	
*	Laguna de la Vega (o del Pueblo)	*05/12/89*	Castilla-La Mancha	34	ha	39º25'N 002º56'W	
*	Laguna de Manjavacas	*26/03/93*	Castilla-La Mancha	231	ha	39º25'N 002º50'W	
*	Laguna de Pitillas	*18/11/96*	Navarra	216	ha	42º24'N 001º34'W	
*	Laguna del Prado	*26/03/93*	Castilla-La Mancha	52	ha	38º55'N 003º49'W	
*	Laguna y Arenal de Valdoviño	*26/03/93*	Galicia	255	ha	43º37'N 008º10'W	
*	Lagunas de Alcázar de San Juan	*26/03/93*	Castilla-La Mancha	240	ha	39º24'N 003º15'W	
*	Lagunas de Cádiz (Laguna de Medina y Laguna Salada)	*05/12/89*	Andalucía	158	ha	36º37'N 006º03'W	
*	Lagunas de la Mata y Torrevieja	*05/12/89*	Comunidad Valenciana	3,693	ha	38º00'N 000º42'W	
*	Lagunas de Laguardia (Alava): Carralogroño, Carravalseca, Prao de la Paul y Musco	*09/12/96*	País Vasco	45	ha	42º32'N 002º33'W	
*	Lagunas de Puebla de Beleña	*20/12/02*	Castilla-La Mancha	191	ha	40°53'N 003°15'W	

*	Lagunas de Villafáfila	*05/12/89*	Castilla-León	2,854	ha	41º49'N 005º37'W	
*	Lagunas del sur de Córdoba (Zóñar, Rincón y Amarga)	*05/12/89*	Andalucía	86	ha	37º29'N 004º41'W	
*	Las Tablas de Daimiel ***MR***	*04/05/82*	Castilla-La Mancha	1,928	ha	39º09'N 003º40'W	MAB
*	Mar Menor	*04/10/94*	Murcia	14,933	ha	37º43'N 000º48'W	
*	Marismas de Santoña	*04/10/94*	Cantabria	6,907	ha	43º25'N 003º26'W	
*	Marismas del Odiel	*05/12/89*	Andalucía	7,185	ha	37º17'N 006º55'W	MAB
*	Marjal de Pego-Oliva	*04/10/94*	Comunidad Valenciana	1,290	ha	38º52'N 000º04'W	
*	Pantano de El Hondo	*05/12/89*	Comunidad Valenciana	2,387	ha	38º10'N 000º42'W	
*	Parque Nacional de Doñana ***MR***	*04/05/82*	Andalucía	50,720	ha	36º57'N 006º19'W	WHS, MAB
*	Prat de Cabanes-Torreblanca	*05/12/89*	Comunidad Valenciana	812	ha	40º14'N 000º12'E	
*	Ria de Mundaka-Guernika	*26/03/93*	País Vasco	945	ha	43º22'N 002º40'W	
*	Ría del Eo	*04/10/94*	Galicia, Asturias	1,740	ha	43º30'N 007º01'W	
*	Rías de Ortigueira y Ladrido	*05/12/89*	Galicia	2,920	ha	43º42'N 007º47'W	
*	Saladar de Jandía	*24/10/02*	Canarias	127	ha	28°03'N 014°20'W	
*	S'Albufera de Mallorca	*05/12/89*	Baleares	1,700	ha	39º49'N 003º07'E	
*	Salburua	*24/10/02*	País Vasco	174	ha	42°5 1'N 002°39'W	
*	Salinas de Ibiza y Formentera	*30/11/93*	Baleares	1,640	ha	38º46'N 001º26'E	
*	Salinas de Santa Pola	*05/12/89*	Comunidad Valenciana	2,496	ha	38º08'N 000º37'W	
*	Salinas del Cabo de Gata	*05/12/89*	Andalucía	300	ha	36º44'N 002º12'W	MAB
*	Txingudi	*24/10/02*	País Vasco	128	ha	43°20'N 001°47'W	
SYRIAN ARAB REPUBLIC							
*	Sabkhat al-Jabbul Nature Reserve	*05/03/98*	Halap	10,000	ha	36º04'N 037º30'E	
THE FORMER YUGOSLAV REPUBLIC OF MACEDONIA							
*	Lake Prespa	*03/05/95*		18,920	ha	40º56'N 021º01'E	
TUNISIA							
*	Ichkeul ***MR***	*24/11/80*	Bizerte	12,600	ha	37º10'N 009º40'E	WHS, MAB
TURKEY							
*	Akyatan Lagoon	*15/04/98*	Adana	14,700	ha	36º37'N 035º16'E	
*	Gediz Delta	*15/04/98*	Izmir Gulf	14,900	ha	38º30'N 026º55'E	
*	Göksu Deltasi	*13/07/94*	Silifke	15,000	ha	36º20'N 033º59'E	
*	Kizilirmak Delta	*15/04/98*	Samsum	21,700	ha	41º36'N 036º05'E	
*	Lake Burdur	*13/07/94*	Burdur	24,800	ha	37º44'N 030º11'E	

	*	Lake Kus (Manyas)	*13/07/94*	Bahkesir	20,400	ha	40º10'N 028º00'E
	*	Lake Uluabat	*15/04/98*	Bursa	19,900	ha	40º10'N 028º35'E
	*	Seyfe Gölü	*13/07/94*	Kirsehir	10,700	ha	39º12'N 034º25'E
	*	Sultan Sazligi	*13/07/94*	Kayseri	17,200	ha	38º20'N 035º15'E

The Regional Activity Centre for Specially Protected Areas (RAC/SPA) constitutes one of the institutional components of the Mediterranean Action Plan (MAP) of the United Nations Environment Programme (UNEP), co-ordinated under the supervision of the MAP Co-ordinating Unit. The Centre was set up in 1985 to assist Mediterranean countries in implementing the Protocol on specially protected areas and biological diversity. The Centre aims at assisting Mediterranean countries to establish and manage marine and coastal protected areas and to conserve biological diversity.

Among the Centre's activities is a project for preparing a **Strategic Action Plan for the Conservation of Marine and Coastal Biological Diversity in the Mediterranean Region** -SAP BIO Project - (1 January 2001 - 31 December 2003).
Starting from an assessment at national and regional level of the state of marine and coastal biodiversity, based on existing scientific data, and taking into account the Jakarta Mandate (developed within the framework of the Convention on Biological Diversity) and the Protocol on Specially Protected Areas and Biological Diversity, the SAP BIO Project aims at analysing the negative factors that affect marine and coastal biodiversity, or the lack of information, and identifying concrete remedial action. Integration of the actions decided on at national, sub-regional and regional level, along with detailed investment portfolios, involvement of stakeholders, and the development of approaches and principles, will become the Strategic Action Plan for Biodiversity. In addition to this strategy, which is the final document of the processes, within the framework of the SAP BIO Project, a series of national and regional reports is being prepared.
The present document is part of this series.

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