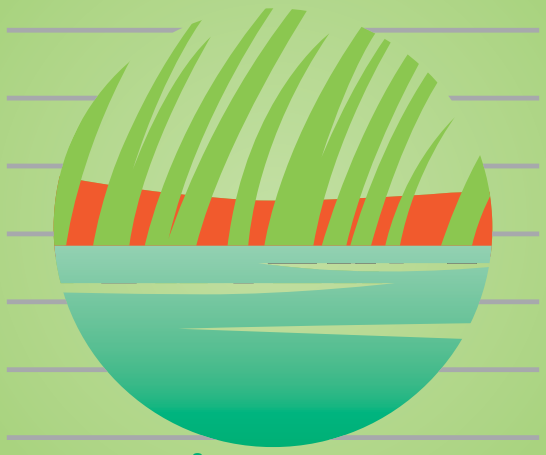
Mediterranean Wetlands Observatory

Mediterranean Wetlands Outlook 2012

Synthesis of the 1st Mediterranean Wetlands Observatory report

FOR DECISION MAKERS



Mediterranean
Wetlands
Observatory

To Luc Hoffmann and Thymio Papayannis,

On the 40th anniversary of the Ramsar Convention,
20th anniversary of MedWet,

As a tribute to their continued commitment and determination for wetlands,
in the Mediterranean and beyond.

Main authors:

Coralie Beltrame, Laurent Chazée, Thomas Galewski and Christian Perennou from Tour du Valat.

Contributing authors:

Alexandre Alias, Antoine Arnaud, Nathalie Barré, Vincent Devictor, Eleni Fitoka, Jean-Pierre Giraud, Patrick Grillas, Charlotte Gully, Lena Hatziiordanou, Emil Ivanov, Jean Jalbert, Quentin Liautaud, Irini Lyratzaki, Raffaele Mancini, Caroline Mayaudon, Thymio Papayannis, Jenyfer Peridont, Karsten Schmalle.

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FOREWORD

Urbanisation, water, agriculture, and biodiversity are among the most pressing ecological issues in the Mediterranean region. There are countless programmes, strategies, and action plans addressing each of them.

However, what is the common point connecting all these issues? Water? Certainly, but what would water be without the ecosystems that store, filter, and return it to us safely?

When they are well managed, wetlands can provide many services to humanity, including fish and shellfish, fruits and vegetables, as well as water for human beings and their livestock. Unfortunately, pollution, overuse of water, poor wastewater treatment, and of course the conversion of wetlands to other purposes are leading to the reduction or destruction of wetlands' capacity to provide flood mitigation services. These also undermine the basis for a sustainable agriculture able to provide food and water suitable for human consumption. When they are poorly managed, overexploited or ignored, wetlands disappear or become quagmires, whereas when they are in good shape, wetlands provide a life-support system and prosperity to the human beings who live nearby!

This is particularly true in the Mediterranean where coastal lagoons, wadis, deltas, and other wetlands were there long before the arrival of humans. Societies have indeed developed thanks to wetlands, but today they are destroying their very life-support systems.

In 1991, the participants who attended the International Symposium on wetlands, in Grado, Italy, expressed their desire to halt the destruction of Mediterranean wetlands, and to start restoring them. Since that time, the MedWet initiative has been working with all the countries in the Mediterranean basin, NGOs, scientific research centres, and inter-governmental organisations, to implement this mission for the protection and sustainable development of wetlands.

In 2009, the Mediterranean Wetlands Observatory (MWO) was created by the Tour du Valat, a founding member of Medwet, well known for its expertise in the Mediterranean basin.

This observatory has developed as Medwet's key instrument for wetlands protection. It aims to provide reliable information on the status and trends of Mediterranean wetlands to decision makers and the general public. It is thus a vital management tool for providing aid to decision makers and raising the awareness of the public at large.

Wetlands conservation and wise use must be a focal issue in the Mediterranean region for the human well-being of those who live there.

Emmanuel THIRY

President of the Medwet Coordination Group

EDITORIAL


David COATES


Nick DAVIDSON

The Ramsar Convention is the first of the multi-lateral environment agreements, celebrating its 40th birthday in 2011. The Convention on Biological Diversity (CBD) arose from the Earth Summit in Rio de Janeiro in 1992. It remains the global international policy umbrella for the conservation and sustainable use of all biodiversity as a means to achieve sustainable development. Throughout its history the CBD has benefited from a very strong relationship with the Ramsar Convention as its lead implementation partner for wetlands.

In the literature, much of which is reviewed in this report for the Mediterranean region, the importance of wetlands has been increasingly recognized. When calculated properly and impartially, most often their values outstrip those of other ecosystems and greatly surpass their values after conversion.

A major reason for this is their role in the water cycle and in particular in regulating water availability (including droughts and floods) and water quality, including associated and related benefits in estuarine and coastal areas. These ecosystems, if allowed to continue to function effectively, provide these and other diverse and substantial benefits to societies. But paradoxically, despite their value, they continue to be the most threatened of all biomes. The intimate relationships between wetlands and water are also a primary reason for their continuing demise. They are very sensitive to water-related changes including the impacts of water use and land use such as irrigation and pollution. We are becoming increasingly aware that land and in particular water resources are subject to increasing stress as use of these resources responds to escalating demands to meet human requirements often accompanied by inappropriate management and inadequate policies. The problems are the worst in regions where water scarcity, population growth and economic development pressures collide and are reflected most visibly through the status and trends of wetlands. In few other regions is this more evident than the Mediterranean.

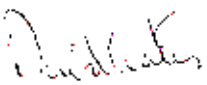
Another paradox is that despite wetlands being our most valuable natural assets, we have the least information about them. Progress in the scientific, management and policy arenas has been continually hampered through the lack of adequate data and monitoring and in particular the absence of robust, science based, regional assessments. Lack of information often undermines our ability to deliver practical case specific to policy advice. Under a confusing and fragmented policy landscape, with competing demands for resources, this information gap also often results in inaction.

Given this background, this first Mediterranean Wetlands Outlook provides a much needed synthesis of wetland status, issues and needs in this important region. This report will be an important contribution to information for the Ramsar Convention. Through this channel it will therefore represent a significant input into the Strategic Plan for Biodiversity 2011-2020 and to monitoring progress towards its Aichi Biodiversity Targets, adopted at the tenth meeting of the Conference of the Parties to the CBD in 2010 as basis for action by all stakeholders. These, and other, international frameworks remain important instruments for global sustainable development. Perhaps more importantly it will be an important step forward in strengthening the information base and awareness in the Mediterranean region itself and deliver what really matters - action on the ground, underpinned by improved local, regional and national policy and regulatory environments, wiser investment and capacity building.

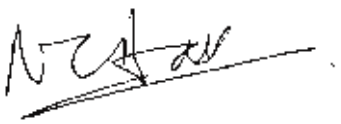
Under circumstances of significant regional and global economic turmoil and uncertainty, it is worth noting that improved wetlands management - compared to conversion or artificialization options for example - often offers direct cost savings and unquestionably can reduce risks and thereby deliver more sustainable, cost effective and resilient solutions. More than anything, wetlands management is about wise and sustainable economic and social development. This outlook will help us take these messages beyond wetlands, particularly to those groups with a critical stake in wetlands but who may not currently appreciate this. "Your business depends on our business" is the simple message to such groups and encapsulates the issue so well expressed in the "Changwon Declaration" adopted by the Contracting Parties to the Ramsar Convention at its tenth meeting in Korea in 2008[1].

Readers will find that there is inadequate information for many areas covered in this outlook. Some of these gaps are due to lack of information itself, some due to resource constraints to gathering and analyzing existing information from a multitude of relevant and dispersed sources. We congratulate the many people who have made this outlook possible, despite the enormity of their task and the limitations of their resources. Despite such limitations, this outlook has convincingly shown that the benefits on offer through incorporating wetlands better into the sustainable development framework for the Mediterranean region. But it is essential that these information and capacity constraints be eliminated in time for its next edition.

David COATES, *Program officer, Secretariat of the Convention on Biological Biodiversity*



Nick DAVIDSON, *Deputy Secretary general of Ramsar Convention*



1 / http://www.ramsar.org/doc/res/key_res_x_03_e.doc

> PREAMBLE

HOW MONITORING WETLANDS MAY HELP DECISION MAKERS IN THE SUSTAINABLE MANAGEMENT AND CONSERVATION OF WETLANDS?

Although wetlands are **one of the ecosystems that globally contributes most to human well-being**, they are also, paradoxically, **the ecosystem that is the most threatened by human activities.** Despite decades of conservation actions, especially within the framework of the Convention on Wetlands of International Importance (Ramsar, Iran, 1971), wetlands have continued to disappear more rapidly than other ecosystems. **This largely results from a widespread, utilitarian and short-term vision of natural resources, including wetlands.** In 1991, the MedWet initiative (see box 1) was launched, as the first-ever regional initiative for the implementation of the Ramsar Convention. Its initial symposium (Grado, Italy, 1991) highlighted the wetland losses that had already occurred throughout the region. Since its beginning, MedWet recognized wetland inventorying and monitoring as key tools that should eventually help monitor Mediterranean wetlands on a routine basis.

In the Mediterranean region, **the main causes of poor wetlands protection and management** have been identified as the **weak environmental policy framework specifically addressing wetlands, insufficient enforcement of environmental laws, and ineffective coordination with other sectors.** Part of the reason for the continuous disappearance and degradation of wetlands is also the **lack and fragmentation of knowledge on their functions and on the services they provide for both humans and nature.** Data on the evolution of these fragile habitats in the Mediterranean area, their biodiversity, functions, and ecosystem services, are patchy at best. Only limited pan-Mediterranean wetlands assessments and long-term monitoring have been carried out, up until now. Even when they exist, they are not easily accessible by those who need them: poor transfer leads to limited use of relevant information on wetlands. The effort in translating scientific information into policy-relevant communication addressed to decision makers is insufficient, resulting in inefficiency in terms of information transfer and influencing policy.

Appropriate wetlands policy and legal framework are of paramount importance for the conservation of wetlands, notably by designating protected sites and implementing the sustainable management of wetlands. In non-protected areas, facing powerful sectoral policy, strategy and legal frameworks, such as agriculture, rural development, energy, and urbanization, cross-sectoral integration and coordination are even more important for the appropriate protection and conservation of wetlands. The government response to protect wetlands directly or indirectly through an appropriate policy and legal framework, and the national capacity to enforce environmental laws and regulations, including when they are attached to other sectoral policies and laws, are then key determinants for operational wetlands protection down the line, which also includes appropriate management planning. .

Feedback and communication from the monitoring and evaluation (M&E) results of past and current wetlands initiatives provide useful information for helping decision-makers improve subsequent wetlands planning and select appropriate sustainable development options. Monitoring and evaluation is not an easy, stand-alone exercise. M&E is increasingly a key management step in programmes, projects, and policy. Over the last two decades, M&E design in international development and conservation has progressively evolved from project to programme level, result to impact, and from a top-down sector approach to a

1. The Medwet initiative

The MedWet Initiative was created in 1991 during an International Symposium on Mediterranean wetlands, as the mechanism for implementing its final declaration "To stop and reverse the loss and degradation of Mediterranean Wetlands". It is a forum of 27 Mediterranean countries, specialized wetland centres, International Conventions, and International Environmental Organizations, which form the Mediterranean Wetlands Committee. It was the first Regional Initiative for the Ramsar Convention, and its mission is to ensure and support the effective conservation and wise use of wetlands through local, national, regional, and international collaboration. It achieves its mission by facilitating the exchange of knowledge and expertise among key conservation actors, reinforcing capacity building and inter-Mediterranean collaboration, and enhancing overall knowledge on Mediterranean wetlands and their management.

participatory integrated exercise. M&E is basically concerned by **how the lessons learned are disseminated and used for improved planning and actions driving impacts and how to upscale them.** Thus, to ensure the usefulness and efficiency of the monitoring and evaluation exercise, targeting of users and regular communication and feedback of results are mandatory items in the M&E process. Usefulness and efficiency are also key requirements for maintaining the confidence and interest of M&E partners and users. The sustained interest of partners is also a prerequisite of the institutional, financial, and technical sustainability of wetland M&E systems.

The Mediterranean Wetlands Observatory (MWO) was therefore created in 2008 in the framework of the MedWet initiative to bridge the knowledge gap mentioned above, and to help shape decision making processes affecting wetlands. In 2010, the MWO started assessing the status and trends of wetland ecosystems in the region. It aims to share knowledge and develop awareness on their multiple functions and services.

The MWO has three inter-related objectives, which will be gradually monitored through the regular calculation of indicators:

1. Provide timely and quality information on the status and trends of Mediterranean wetlands.

2. Track threats to Mediterranean wetlands and identify actions to promote their conservation, wise use, and restoration.

3. Assess the level of consideration given to wetlands in the context of sustainable development in the Mediterranean Basin.

Its ultimate goal is to improve wetlands conservation and management in the Mediterranean region by providing information to a broad audience, especially decision makers and the public at large.

The first-ever report, based on the review of scientific data and other information relevant to Mediterranean wetlands, was made in 2010-2011 (see Vol. 1 "Mediterranean Wetlands Outlook 2012-Technical report"). A second report - this one- for decision makers sums up the main findings, messages, and results of the main report, which are analyzed in a broader policy and strategy context. This synthesis provides analysis on the causes of the successes to build on, and on the causes of the failures to try to rectify. This report is to be considered as a first step, since the measurement of indicators must be further developed and strengthened, and monitoring methods must be harmonized for some of them.

This work was conducted by the coordination unit of the Mediterranean Wetlands Observatory at the Tour du Valat Foundation, with contributions and expertise from partners and draft reviews by key MWO partners, including country representatives. The analysis and assessment are based on the measurement of the set of indicators presented in Table 1. The summaries of the 17 MWO indicators (with 2 sub indicators) monitored, or under development, are attached to this report. The definition of 'wetlands' and 'Mediterranean region' considered in this report are given in box 2.

Finally, to make this synthesis easier to read, most of the references have been removed, but they can be found in the main report.

MWO meeting, Camargue, France

2. Definition of "wetlands" and "Mediterranean regions" as considered in this report

• *"Wetlands" are understood in the broadest, Ramsar sense, i.e., encompassing virtually every aquatic ecosystem except the sea beyond coastal, shallow areas. This definition therefore includes rivers, large lakes, reservoirs, chotts, sebkhas, and groundwater systems.*

• *The "Mediterranean region" is generally considered to encompass 27 territorial entities, referred to hereafter as the 27 Mediterranean-or MWO-countries, presented in map 1 below. They include the MedWet parties[2] (26 countries and the Palestinian Authority) (www.medwet.org). However, depending on data available, the results for some indicators may cover only part of the Mediterranean region in this broad sense (e.g., only the Mediterranean watershed component of some countries, or only the 22 strict Mediterranean riparian countries (the 22 countries of the 23 Barcelona convention contracting parties), when data are from the Plan Bleu, a key MWO partner).*

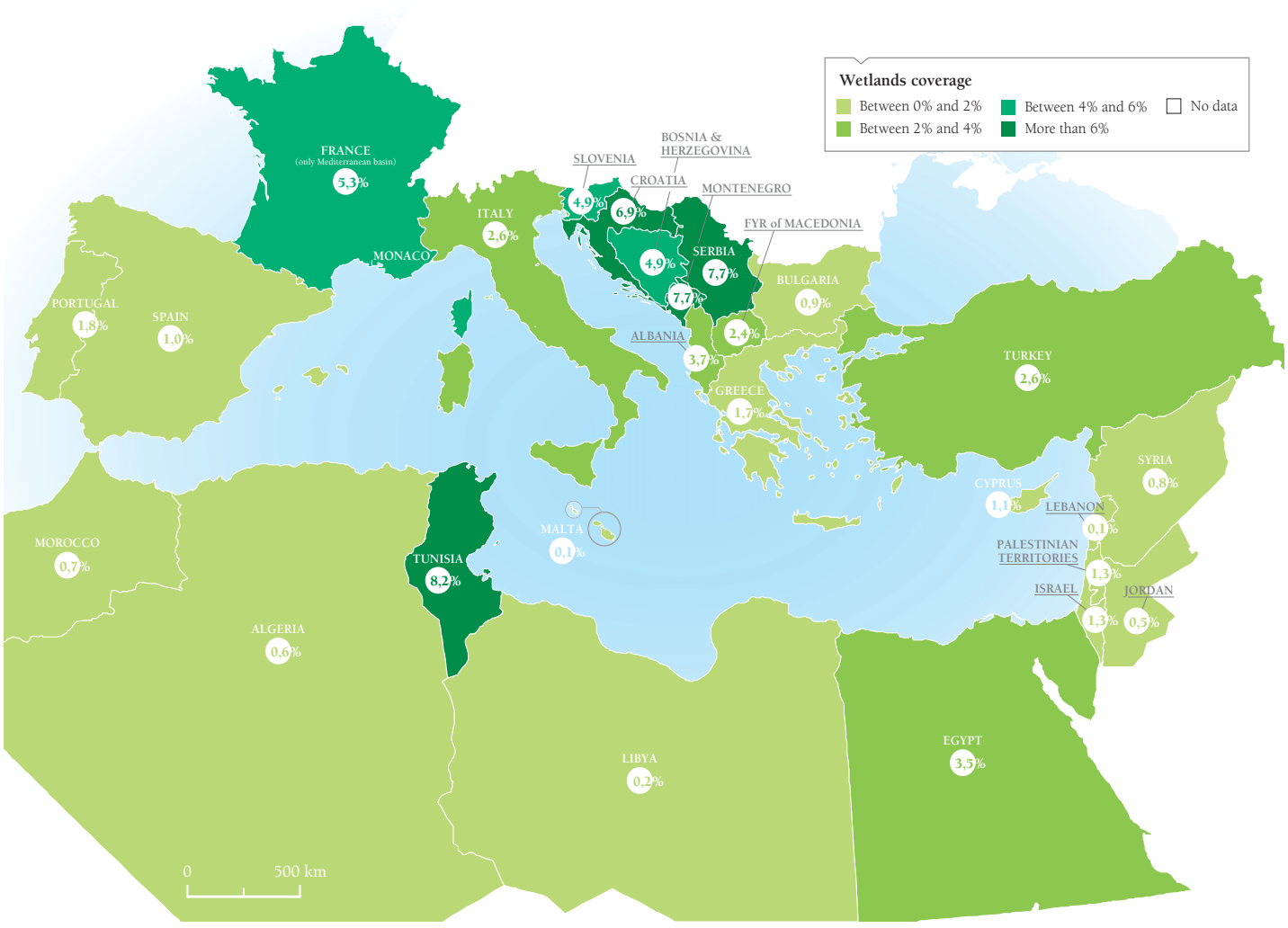


Fig. 1. ***The 27 Mediterranean countries and the coverage of wetlands***

2/Kosovo is part of the Mediterranean basin, but not yet a MedWet member, as it has not signed the Ramsar Convention. However, some past data from former Yugoslavia and current Serbia includes data covering the current territory of Kosovo.

KEY FINDINGS

The following findings are derived from the results of the MWO indicators and of the cross-cutting analysis that takes into account a broader regional context and macro-indicators relevant to wetlands. Table 1 below summarises the status and trends of Mediterranean wetlands with a breakdown of results by clusters of countries.

THEMES AND INDICATORS	General trends	Trend by group of countries		
		EU countries (except Bulgaria)	Countries influenced by EU and OECD (a)	Countries with no mandatory supra-national guidelines (b)
Status and trends				
1. Diversity and abundance of species	** →	*** →	** ↘	* ↘
1.a. Diversity and abundance of species : waterbirds	** ↗	*** ↗	** ↘	** ↘
2. Wetland birds and climate change	** ↘	** ↘	** ↘	** ↘
3. Wetland birds and land-use change	** ↘	** →	** ↘	** ↘
4. River flow	** ↘	** ⇄	** ↘	* ↘
5. Water quality (only for nitrates in rivers)	*	**	**	*
6. Wetland surface area (trend: 20th century)	* ↘	** ↘	** ↘	* ↘
Direct causes of change				
7. Renewable water resources	** ↘	** →	** ⇄	** ⇄
8. Water demand per sector	**			
9. Human demography	*** ↘	*** ↘	*** ↘	** ↘
10. Land conversion to agriculture and urbanization	* ↘	** →	** → (Turkey non included)	* ↘
Impacts and benefits				
11. Role of wetlands in water supply	* ↘	* ↘	* ↘	* ↘
12. Role of wetlands in water purification	* ↘	* ↘	* ↘	* ↘
13. Role of wetlands in flood & drought	* ↘	* ↘	* ↘	* ↘
14. Educational & touristic role of wetlands	* ↗	* ↗	* ↗	* ↗
Responses				
15.1 Surface of Ramsar wetlands	*** ↗	*** ↗	*** ↗	*** ↗
15.2 Surface of nationally protected wetlands (trends refer only to Albania, Cyprus, Serbia)	*	** ↗	** ↗	*
16. Strategic efforts in wetlands protection	*** →	↗	↗	↗
17. Wetlands and Millennium development goals (Trends 2005-2010).	*** ↗	→	↗	↗

Table 1: ***Mediterranean wetlands: monitoring results at the mediterranean scale and by cluster of countries.***

Status: Favorable / Medium / poor / not enough information, or indicator not yet ready.

Trends: → Stable / ↘ Degradation / ↗ improvement / ⇄ variable: from degradation to stabilization trend.

*Level of accuracy: * Weak / ** Correct / *** High*

(a): Turkey, Montenegro, Albania, Bosnia and Herzegovina, Croatia, Serbia, FYR of Macedonia, Bulgaria, Israel.
(b): Egypt, Morocco, Tunisia, Algéria, Libya,Syria, Lebanon, Jordan, Palestinian Territories.

STATUS AND TRENDS OF WETLANDS

- **Wetland extent: an ongoing downward trend.** With 18.5 (± 3.5) million ha of wetlands, the Mediterranean region hosts between 1% and 2% of the world's wetlands. This represents 1.7 to 2.4% of the total area of the 27 Mediterranean countries. It has lost at least c. 50% of the wetlands that existed in 1900. These losses continue, although the rate has seemingly slowed down in the EU Mediterranean countries. The total area of wetlands now includes c. 23% of artificial wetlands

- **Land-use changes** through the conversion of wetlands into urbanised and agricultural lands, and the increasingly artificial water management that have occurred during the last decades. This has heavily impacted wetlands, which can be measured through changes in bird communities. Many species particular to seasonal Mediterranean wetlands have decreased in abundance, whereas a few generalists have dramatically increased, adapting quickly to the abundant resources provided by the eutrophication of wetlands, the intensification of agriculture/fisheries, and the great increase in artificial wetlands.

- Efficient conservation actions have been focused for decades on protecting **waterbirds and the large waterbodies** that host them, especially in Western Europe. However, the other components of biodiversity are on the decline. Trends in wetland biodiversity are particularly preoccupying in the Eastern Mediterranean.

- **River discharges** are declining overall, except for the Rhone and Po. River flows are generally deeply affected by water abstraction and dams built along their course.

- **Water quality** cannot be assessed overall in the Eastern and Southern Mediterranean, as too few monitoring data are available. Water quality has been improving in Europe since the 1980's for nutrients and (locally) heavy metals, but at a variable pace depending on habitats and countries. Other pollutants may have increased (pesticides), but have not been sufficiently monitored.

- **Freshwater in the Mediterranean may be sufficient for both people and wetlands ecosystems** , if managed well and used efficiently. However, by maintaining a supply driven water policy, wasting about 40% of the water supplied, inadequately adopting water saving technologies, practicing commercial farming requiring great amounts of water in arid countries, and adopting alternative and sustainable freshwater options too slowly, water scarcity and shortages faced by people and wetlands are common in the southern part of the Mediterranean

- **The amount of water that remains available for the environment and wetlands** in particular, is decreasing throughout the Mediterranean region, once water consumed by human activities is deducted. This leads to the disruption of key services provided by wetlands to human communities. The situation is becoming particularly severe in the South of the Mediterranean Basin

Flamingos, Camargue, France

Climate change effects are already noticeable: the Mediterranean Sea level has risen by 22cm during the 20th century, leading to changes in coastal areas, including wetlands. Impacts are also clear on wetland bird communities, advantaging hot-dwelling species to the detriment of cold-dwellers. There is a general northwards shift in the waterbird assemblage, which also means that an increasing number of birds winter in the Mediterranean instead of migrating to Sub-Saharan Africa.

CAUSES OF CHANGES

Root Causes of changes

Demographic growth, including seasonal tourist flows and associated investments, are particularly affecting coastal areas and river valleys where most remaining large wetlands occur, mainly through urbanization, land reclamation and water abstraction.

Gediz delta, Turkey

Wetlands are quite low on political agendas, despite their key role in a central strategic issue: water management. Moreover, conservation policies and strategies lack a long term vision and impact-based orientation, maintaining short-term strategies resulting in poor continuity in terms of implementation.

Protection laws are poorly enforced, especially in Eastern and Southern Mediterranean countries, while effective conservation measures are benefiting water birds in the Western part.

There is still **not a sufficiently comprehensive and integrated water management policy and strategy** in most countries.

The segmented territorial planning process between protected and non-protected areas often maintains non-sustainable environmental and human development options.

The institutional coordination and inter-sectoral mechanisms for wetlands conservation and wise use are not often efficient, leading to poorly integrated and unsustainable development options.

There is **limited development of national wetlands policies and strategies**, and when elaborated and endorsed, they are generally **implemented and monitored** inefficiently, especially in Southern and Eastern Mediterranean countries, mostly because of insufficient financial and human resources.

Main direct pressures on wetlands

While **agriculture** is the sector impacting wetlands and water the most in absolute terms, **urbanization, public infrastructures, and tourism** show higher development trends impacting natural and semi-natural ecosystems including wetlands, especially on coastal areas. Pressures from these economic sectors are likely to increase in the coming decades.

Irrigated agriculture is the main **water consumer** in the Mediterranean (two-thirds of total consumption). Over-abstraction of water in wetlands kills agriculture in some North African areas, although irrigated surface areas are now stabilizing in the EU, Israel, and Egypt.

Overexploitation of groundwater is often underestimated, but is of urgent concern in steppe and desert areas, especially in Algeria, Egypt, Libya and Syria. It contributes to the drying up of natural and artificial wetlands, and leads to non-sustainable human settlements.

Bekaa Valley, Lebanon

IMPACTS OF CHANGES ON WETLANDS AND PEOPLE

On the negative side

Many Mediterranean freshwater ecosystems have been irreversibly modified.

The loss of the **"Mediterranean" character of wetlands biodiversity** is mainly due to the standardisation of water and wetland management practices in all countries that have superseded previous diversified and more environmentally-friendly management systems.

Seizure of illegal fishing equipment, Egypt

Social tensions and economic losses have been observed among local communities when territorial planning between protected and non protected areas is not harmonized and when the conservation-driven option is not balanced with people's development needs.

On the positive side

Many **"emblematic" species** such as pelicans, flamingos and cranes are recovering and have often been connected with the territorial and cultural identity.

Social enhancement of people is a consequence of the increasing environmental awareness and education programmes.

Economic returns for local communities and the tourism sector takes place through sustainable tourism promoting attractive wetlands, including their productive services and cultural assets.

At this stage, it is difficult to assess the impact on the value and functional status of ecosystem services: despite the vital role of wetlands for human well-being, the ecosystem services provided by Mediterranean wetlands have been inadequately studied and promoted.

Hula Valley, Israel

Pont de Gau park, Camargue, France

Provisioning services (production, livestock farming, fishing), and cultural value (tourism) have been the most studied. Conversely, regulating services such as water purification, and flood attenuation are less well-known despite their importance in mitigating or preventing physical damage and human loss.

RESPONSES OF SOCIETIES AND MANAGEMENT

Supra-national agreements, conventions, protocols, and instruments are influential mechanisms for harmonized and coordinated environmental protection objectives and targets in the Mediterranean. EU directives, the Convention on Biological Diversity, World Heritage convention, Ramsar Convention, Man and Biosphere programmes, and Millennium Development Goals mutually reinforce their effects, locally and nationally.

EU policy and operational tools (i.e., the Habitat, Birds and Water directives, and Natura 2000 network) are the most efficient driving forces benefiting environment in the North Mediterranean (EU members and accession countries). They speed up the processes by which protected areas including wetlands are designated, and push states towards more sustainable water and biodiversity management.

The number of Ramsar sites has been increasing rapidly (344 sites by October 2011, compared to 168 in December 2000),i.e. + 104%. They now represent 6 million ha. Nationally protected wetlands are also on the rise.

Wetland strategies About 30% of MedWet countries have both a **wetlands policy/strategy** framework and **a national wetlands committee,** potentially able to influence cross-sectoral decision-making and planning for wetlands. In reality, in most countries, these instruments are not institutionally formalised across sectors, have a low leveraging effect, and are effective only in protected areas.

Millennium Development Goals. Compared to the world average, the Mediterranean region shows relatively better trends in terms of achieving the 2015 MDG environmental objective for water-and wetlands-related targets (improved water supply, improved sanitation, improved lodging and forest protection).

There is a **progressive harmonisation** of coordination of development and conservation between regional, national, and local levels, limiting duplication and inconsistency. However, the environmental sector, including the wetlands sub-sector, is usually not a key player in the final coordination decision.

Environmental awareness and education efforts have been sustained and diversified, encouraging a wide range of people, from politicians to civil society, to progressively **adopt a more environmentally-friendly behaviour.**

There has been **slow improvement in terms of monitoring wetlands biodiversity.** However, data collection on wetland habitats, and socio-economic and ecosystem services, the broad analysis and interpretation of these data, and the communication of results are the main bottlenecks in the monitoring process, limiting monitoring efficiency and the usefulness for decision makers.

The continuing progress **of the Local Development Planning** system in Southern and Eastern Mediterranean countries tends to **mainstream social, economic, and environmental considerations in territorial development**. However, this bottom-up planning system has only been formalised in some countries, and the ecological expertise is still lacking compared to the social and economic components.

Ministries and civil society work together trustfully only in sufficiently decentralised governance situations, while in other countries, NGOs are left out of the national programmes and strategic discussions, and are mostly active through internationally funded projects.

Gediz delta, Turkey

KEY MESSAGES

SAVING WETLANDS...

- There is an increasing amount of documented evidence that the cost to humankind of continued wetland degradation and loss is far greater than the cost of wetland conservation and restoration.
- Accelerated, integrated, and inter-sectoral efforts at local, national, and international levels are needed to save Mediterranean wetlands, since at least 50% of the wetlands that existed in 1900 have been lost and their number and surface area are still diminishing.
- Priority protection and monitoring efforts are particularly needed in coastal zones, river valleys, and inhabited arid areas where wetlands are most threatened, especially small and seasonal ones.
- Inter-related efforts are needed to address the root causes of wetland loss and degradation as well as their biotic homogenisation. These include improved conservation governance, improved policy design, enforcement of existing protection laws, and increased implementation and coordination efficiency of actions taken in wetlands.
- While it is important to speed up the protection and sustainable management of additional wetlands and the implementation of conservation programmes to maintain their functions and values for the benefit of current and future generations, it is equally important for conservation stakeholders to also promote this goal in non- protected areas by actively participating in national and local land-use planning.
- Sustainable development options benefiting wetlands conservation can be reinforced by fostering more participation from and exchange with civil society, scientists, and decision-makers.
- To better incorporate the lessons learned for improved wetland planning, national monitoring of wetlands should go beyond a "mechanical sectoral exercise". Monitoring should be enhanced so as to evolve from an informative to an impact-based management tool able to assess the results of past policies and efficiently influence decision-makers.
- In that perspective, more efforts are needed to monitor wetland habitats, ecosystem services, and wetland-related livelihood, and to analyse data in broader national and local contexts.

saltpans and ricefields, Camargue, France

... AND SUSTAINING ADVANTAGES AND BENEFITS FOR PEOPLE TODAY FOR FUTURE GENERATIONS

- People greatly benefit from the major productive and regulating roles of functional wetlands, such as the provision of food, local construction materials and water, and the attenuation of floods and droughts.
- In particular, a large part of Mediterranean agriculture, an important economic and employment sector in several countries, relies on water resources that can only be sustained with wise wetland management.
- To speed up the recognition of the services wetlands provide, development sectors and key local operational stakeholders should be more involved in assessment initiatives of ecosystem services.
- Water stock and replenishment of the water table are also urgent issues to address through the wise exploitation of groundwater sources, as well as appropriate management and restoration of floodplains along rivers, since water is currently being over-abstracted at an alarming rate.
- In water-poor countries, water is the most sensitive component of wetlands around which decision-makers are usually mobilised. It is important for institutions, NGOs, and individuals working on wetlands to maintain regular contact and working relationships with water authorities in order to contribute to water strategy and policy.
- It is also a priority to continue improving water quality and its monitoring through the implementation of the existing agreements/legislation, whether international (Barcelona Convention, EU) or national (especially in non EU countries).
- Sustainable tourism integrating natural, aesthetic, and cultural values may be a strategic segment of the tourism sector to be developed. It would allow the wetland area to be promoted economically and socially, and to educate and raise awareness about the importance of wetlands.

Gediz delta, Turkey

PART I.
CONTEXT IN THE MEDITERRANEAN BASIN

Today, the Mediterranean basin is one of the regions in the world experiencing the greatest tensions, including economic, social, political, religious, and of course environmental ones. There are many dividing lines. The most striking ones, which have a strong impact on wetlands, and generate other divisions, are:

- **The availability of water:** 86% of the water resources are located on its northern shore. Meanwhile, 60% of the world population lacking water (less than 1000 m3/pers./year) lives in one of the countries around the Mediterranean Sea. Of these 180 million inhabitants, 60 million are living with extremely limited water resources (less than 500 m3/pers./year), and 20 million do not have access to drinking water.
- **The economic situation:** the Mediterranean countries to the north (17 countries) contribute 90% of the regional gross domestic product (GDP) compared to only 10% for those to the south (10 countries). The an average GDP/capita is 2.5 higher in the North than in the South.

I.1. MAIN FEATURES OF THE REGION

The human factor

Half a billion humans live in the 27 countries of the Mediterranean basin (7% of the world population), 135 million of which live on the coast.

For the 22 Mediterranean countries of the Barcelona Convention, populations in the South and East have doubled between 1970 and 2000. They are expected to increase by another 96 million by 2025. In the North, population grew by 14% over the same period, and will increase by a mere 4 million by 2025.

The massive seasonal influx of tourists (275 million international tourists per year, i.e., 30% of worldwide tourism; 390 million expected by 2025) is a very large consumer of living space and natural resources.

Camargue, France

A huge and growing pressure on water resources

The combination of the North-South divide, globalisation, a relative economic decline, an increasing and dense human population, and the world's highest pressure from tourism, is creating unprecedented pressure on the Mediterranean's natural resources, especially water:

290 km^3 of water is used each year (i.e., half the exploitable, renewable resource; but much more in some countries), 40% of which is lost due to faulty equipment and inappropriate techniques;

Irrigated surface areas have doubled between 1965-2005;

In the South, 82% of the water is used for farming, generally with a low efficiency.

A hotspot for climate change

The Mediterranean region will be especially affected by the following climatic changes:

Greater warming than the global average;

Greater variability in rainfall and temperature;

Heat peaks in summer;

A higher frequency of extreme events such as droughts and floods.

I.2. RECENT IMPORTANT EVENTS FOR WETLANDS

Beyond the unique context facing the Mediterranean, a few recent events have had - or are likely to have - an increasing importance for Mediterranean wetlands:

- **EU legislation has increasing influence on wetlands.** There are now 9 Mediterranean EU members, and several other countries are getting prepared for EU accession in the Balkans and Turkey. All are already implementing - or at least influenced by - wetland-relevant EU laws and instruments, in particular the Water Framework, Habitats, Birds, and Nitrate directives, and by Natura 2000 and ecological networks.

- **The financial and economic crisis**, which started in 2008, **has affected all Mediterranean countries**, particularly Greece and Portugal, and more recently Spain and Italy. This has involved severe budget cuts for the environment and the postponement of previous environmental commitments, (e.g., in Tunisia, Portugal, Spain, France, Italy, and Greece).

- **The Arab states revolutions have opened, for environmental matters, a period of both opportunities for the long-term, and uncertainty in the short-term**. Starting in Tunisia in January 2011, they have impacted several Arab states in the Mediterranean region, especially Egypt, Libya, and Syria, with various outcomes. In the short term, the conservation of some protected areas - including wetlands - may have suffered, as reported in Tunisia. In the longer term, the new political agenda, governance, and participation of the civil society may affect wetlands positively.

- **The increase in oil and gas prices finance major programmes impacting water and wetlands**. Since 2007, oil and gas have provided increased revenues for Algeria, Libya, Syria, and Egypt. This has helped fund major programmes for highways, large-scale house-building, irrigated agriculture, desalination plants etc., often with a noticeable impact on wetlands and water resources. Investments have slowed down in 2011 in Libya, Syria, and Egypt due to the revolutions.

- **Recent increase in agriculture intensification may further stress water resources and wetlands**. In response to the 2007 World food security assessment, international funding agencies have been increasingly supporting efforts to boost global agriculture production. Effects are already visible in the Mediterranean (e.g., in Morocco, Turkey, and Egypt). Intensification through irrigation and drainage will likely further impact wetlands and water resources.

- **A few recent key global and regional decisions made on the environment may impact the future of global biodiversity including in wetlands**. The Mediterranean Protocol on the Integrated Management of Coastal Zones, under the Barcelona Convention, was approved in 2008 and entered into force in March 2011. In October 2010, the Convention on Biological Diversity (CBD) approved its targets for 2020 in Nagoya (Japan). On the other hand, the outcomes of the Climate Change conferences (Copenhagen 2009, Cancun 2010and Durban 2011) are less promising. The decision in June 2010 to create an Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES), validated by both the UN and CBD the same year, may take several years to have an impact in the field.

- **The creation of the Union for the Mediterranean ("UfM")** in 2008 **aimed to re-launch the Barcelona process**. This initiative aims to reinforce collaboration between the EU and all Mediterranean countries, especially in the fields of energy, water, transport, and the environment. Due to the sensitive political issues at stake, concrete outcomes are still awaited. Nevertheless, the UfM has maintained an ongoing political dialogue between countries, and has promoted a number of sustainable development projects.

Vegetable crops in the Neretva delta, Croatia

PART II.
WETLANDS AT THE HEART OF THE MEDITERRANEAN BASIN ISSUES

Gediz Delta, Turkey

Are the status and trends of Mediterranean wetlands better or worse compared to the international average? As shown below, environmental protection measures and biodiversity are scoring above the international average, while the rate of wetland loss is similar to the global figure, and freshwater faces particular and alarming pressure in the region.

II.1. STATUS AND TRENDS OF MEDITERRANEAN WETLANDS IN THE INTERNATIONAL CONTEXT

Environmental protection measures above the international average

While it is not easy to compare Mediterranean wetlands status with the other parts of the world, the review of the results of a large number of comparable international indicators from international sources (CBD, UN organizations, WWF, WCMC), show that efforts and achievements for environmental protection over the last two decades score higher than the international average. This is especially visible in the efforts deployed in the policy and legal framework, in progress toward and achievements of international and national environmental targets (Convention on Biological Diversity (CBD), Ramsar convention, European Union (EU), and the Millennium Development Goals (MDGs)). Efforts in the Mediterranean region have contributed to relatively better impacts on wetlands avian biodiversity (Living Planet Index monitoring at Mediterranean and global scale), on pollution due to efforts in improved sewage treatment (MDG target), on watershed forest protection (MDG target), and in additional wetland site designation (especially through Natura 2000 and Ramsar). For example, the number of designated Ramsar sites in the Mediterranean has almost doubled during the last decade. Between 2000 and 2010, the Ramsar area in the Mediterranean has increased by 250%, compared to 148% at the global scale during the same period. However, there is not enough data to assess water protection (quantity and quality) and ecosystem integrity.

Extent of wetlands: still a downward trend similar to global figures

At the turn of the 21st century, the Mediterranean had an estimated surface area of wetlands of 15-22 (18.5 ± 3.5) million ha. For comparison purposes, estimates of wetland extent at worldwide scale range from 748-778 million hectares (excluding salt marshes, coastal flats, sea-grass meadows, karsts and caves, and reservoirs) to 1.2-1.3 billion hectares. The Mediterranean would therefore host c. 1.5% of global wetlands.

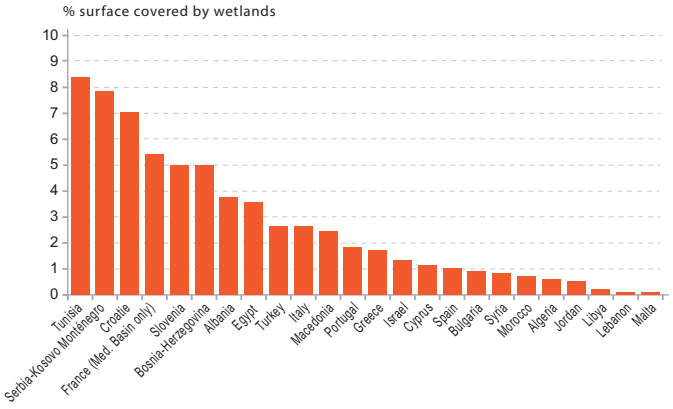


Fig. 2 : ***Proportion of wetland coverage, in relation to total country surface area, for Mediterranean countries*** *(Serbia, Montenegro, and Kosovo are presented together, due to the fact that the latest information available dates from a time when they were united). Sources[3] .*

For the 20th century, the loss of wetlands worldwide has been estimated at 50% of those that existed in 1900. Although no exact figure can be produced for the Mediterranean, existing national or sub-national datasets suggest that the Mediterranean region has followed the global trend in experiencing very probably at least a 50% loss in the same period. Major losses occurred mainly between the 1950s and 1970s in most countries (See indicator fact sheet N°6, Table 1, and Fig 3 below)

The human needs for land and water are often driving the disappearance of Mediterranean wetlands. In the first case,

3/Azafzaf et al. 2005, 2006 ; Baccetti et Serra 1994 ; Caessteker 2007 ; Carp 1980 ; Casado et Montes 1995 ; Casado et al. 1992 ; Ceran 2005 ; Cizel 2010 ; Dakki et El Hamzaoui 1997 ; De Maria 1992 ; Defos du Rau et al. 2003 ; DGF Algérie 1998 ; Etayed et al. 2007 ; Evans 1994 ; Farinha et Trindade 1994, Green et al. 2002 ; Handrinos 1992 ; Haslam et Borg 1998 ; Heath et Evans 2000 ; Hughes et al. 1994, 1997 ; Hughes et Hughes 1992 ; Karadeniz et al. 2009 ; Levin et al. 2009 ; Magnin et Yarar 1997 ; Maticic 1986 et 1993 ; Micevski, 2002 ; Michev et Stoyneva 2007 ; Mima, et al. 2003 ; Ministerio de Obras Públicas y Urbanismo 1996 ; Muzinic 1994 ; Nivet et Frazier 2004 ; Psilovikos 1990, 1992 ; Pullan 1988 ; Saber 2006 ; Saber et al 2008 ; Scott 1980, 1995 ; Toutain et al. 1989 ; Institut de gestion de l'eau (Slovénie). 2000 ; WWF Italie 1996 ; République Fédérale de Yougoslavie 1998, Zalidis et Mantzavelas 1994.

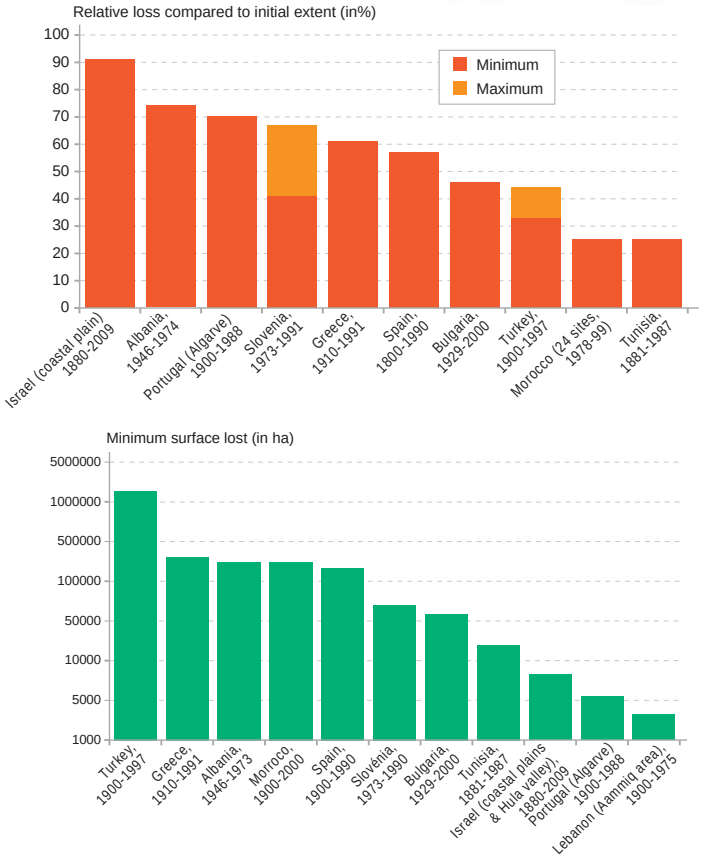


Fig. 3. ***Estimated loss in area of natural wetlands in selected Mediterranean countries/provinces in (mainly) the 20th century:*** *Top = relative loss (in %) compared to initial extent; Bottom = minimum surface lost (in ha). Note that some of these losses include conversion from natural to artificial wetlands, e.g., rice fields and reservoirs. Sources*[3]

wetlands are intentionally reclaimed to be converted into agriculture, residential, or industrial land. In the second case, water over-abstraction from wetlands in their catchment areas, or from the underlying water-table (in the case of ground-fed wetlands), leads to their gradual drying-up. In a second step only, dried-up areas may then be converted to other purposes such as urbanization. In many areas, these two needs (land and water) have acted in conjunction. In the past, wetlands were drained for sanitary reasons too, especially to eradicate malaria and other water-borne diseases.

Biodiversity: a better trend for Mediterranean wetland vertebrate populations compared to global figures

Based on the Living Planet Index indicator (see indicator fact sheet 1), vertebrate populations show a stable trend overall from 1970 to 2006 (Fig. 4). As in most other temperate regions of the world, wetlands biodiversity seems to fare better in the Mediterranean basin than at the global scale, where the overall trend is c. -35% since 1970, mainly due to the bad conservation status of tropical, wetland-dependent species (-70%).

But a stable LPI does not mean that Mediterranean wetlands have a satisfying conservation state. In 1970, Mediterranean vertebrate populations were already at depleted levels and a stable trend in the index suggests they have not recovered since then. Furthermore, the overall Mediterranean trend hides discrepancies between sub-regions, and between taxonomic groups. The bird index shows that both the bird and especially the waterbird populations have increased markedly (about 70% and 100%, respectively) since 1970, whereas mammals, amphibians, reptiles, and fishes have declined by of 40% on average.

The increase in the Mediterranean Waterbirds LPI (see indicator factsheet 1.a) was partly driven by an earlier improvement of the conservation status of populations breeding in Northern and Central European countries, a trend that subsequently spread to the South. This positive trend can be correlated with a series of factors such as campaigns to end persecutions of fish-eating birds, ones for the adoption of more rational hunting practices. The enhanced environmental awareness also resulted in banning the most dangerous pesticides for wildlife (e.g., DDT). More generally, the implementation of international agreements such as the Ramsar Convention (1971), the MedWet Initiative (1991), the Barcelona Convention (1976) and its protocol on specially protected areas and biological diversity (1995), the Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA, 1999), the Birds and

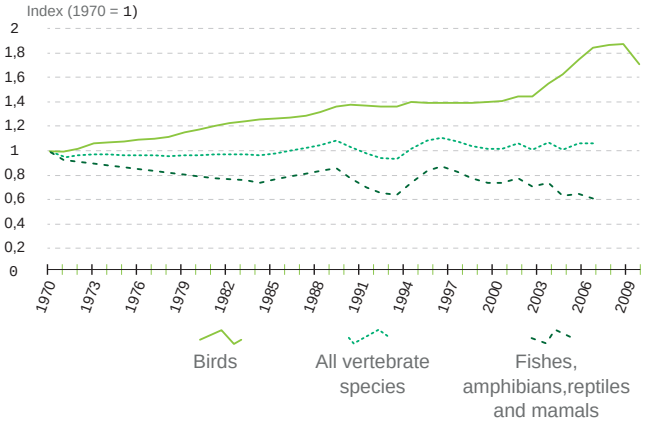


Fig. 4. ***Living Planet Index for Mediterranean Wetlands, 1970-2008.*** *The Mediterranean Wetlands LPI represents the overall trend for 464 vertebrate species (60,000 time-series). Bird and Non-bird species indices are aggregated with unequal weighting to produce the Mediterranean Wetlands LPI. Source MWO, 2011*


Dragonfly

Mediterranean tree frog

Habitats Directives (1979 and 1992) have all been effective driving forces in identifying and protecting wetlands of major importance in the Mediterranean.

On the other hand, mammals, reptiles, amphibians, and fish monitored in Mediterranean wetlands show an overall 40% decline since 1970 (Fig.4). This result is in line with Mediterranean Red Lists published by the International Union for the Conservation of Nature (IUCN): 39% of freshwater fish, 30% of amphibians, 25% of reptiles, and 15% of mammals occurring in Mediterranean countries are threatened with extinction at a global scale, versus only 5% of birds. For freshwater fish, the situation is worse at the Mediterranean level than at the global scale: 39% of freshwater fish species are threatened with extinction in the Mediterranean against "only" 15% of world's species. The reasons behind such a worrying conservation status include intrinsic problems like limited dispersal abilities and restricted ranges. This bad situation may be caused by a range of factors including water pollution (especially eutrophication), habitat loss and degradation, and invasive alien species.

European pond terrapin

Water: high pressure in the Mediterranean

Water scarcity

The Mediterranean is one of the regions in the world facing the highest water stress. With 1,200 km³ of water, the Mediterranean basin receives only 3% of the annual, global freshwater resources, although it concentrates 7.3% of the world population. Moreover, a large part (70%) of the regional water resources is irregular over time and unevenly distributed geographically. As a consequence, the Mediterranean hosts almost 60% (over 180 million people) of the global, "water-poor" population. Among them, about 60 million face "water scarcity", mainly in Malta, Libya, Algeria, Tunisia, Israel, and the Palestinian territories. The North African countries, with 92% of internal renewable water resource withdrawn, have already exceeded the limit for sustainable water resources. In order to satisfy their needs, most Mediterranean countries[4] are therefore net importers of "virtual water"-the invisible water flows contained in the agricultural and industrial products traded by the Mediterranean countries.

The 22 Mediterranean countries of the Barcelona convention consume, overall, almost one-quarter of their renewable resources, and almost half of their really exploitable, renewable resources (Fig 5). About 80% of this renewable water used comes from surface sources (rivers, lakes, and dams), the rest from aquifers. The overall freshwater discharge to the Mediterranean Sea has gone down from c. 606 km³/year around 1920, to 440 km³ in 1970, and 333 km³/year around 1995. These figures hint at the increasingly reduced amount of water available for wetlands in the region.

Finally, renewable aquifers are increasingly over-exploited, especially in desert and coastal areas. This often leads to a decline in the groundwater stock, seawater intrusion, and salinisation of the groundwater and topsoil irrigated by this salty groundwater. The over-exploitation of water resources negatively impacts the sustainability of wetland functions, human settlements, crop production, and ultimately income from agriculture.

Poor monitoring of water quality

The quality of water is important for the functioning of the wetland ecosystem itself, for the conservation of biodiversity, and for the human uses of water. Conversely, wetlands contribute to the natural depuration of water, and their drainage leads to decreasing water quality through the loss of this natural process.

However, the current monitoring of water quality is heterogeneous, and results are difficult to compare between regions and countries. It usually focuses on rivers, lakes, reservoirs, groundwater, and coastal waters, whereas other types of wetlands (e.g., marshes, temporary ponds, and oxbows) are rarely monitored. In the northern fringe of the

4/i.e., all countries measured, except Bulgaria, France, Syria, and Tunisia

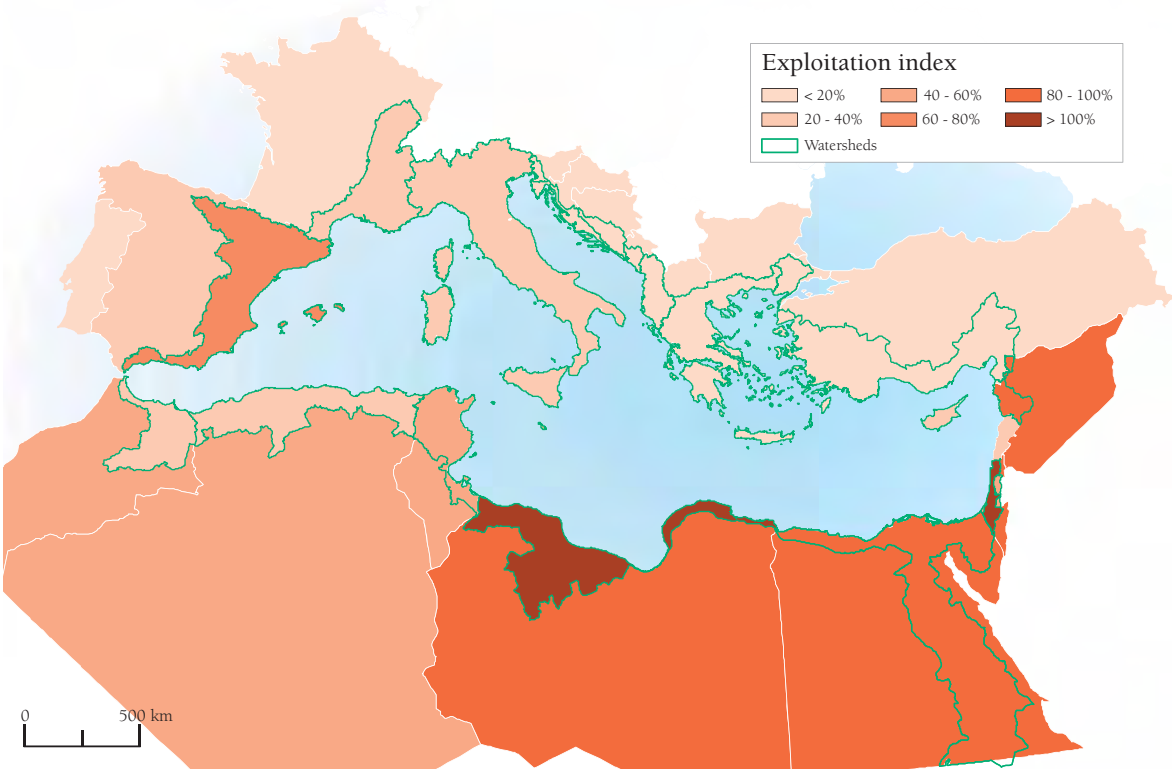


Fig 5. ***Exploitation index of renewable natural water resources (in %), at national and Mediterranean watershed levels.*** *Source: 2011 Plan Bleu from national sources supplemented by data from EEA for Bulgaria, F.Y.R. of Macedonia and Portugal.*

Mediterranean region, some elements of water quality, such as nitrogen and phosphorus, have been monitored since the 1950-60s, and comparable data is available. In Europe generally, including the North Mediterranean, water quality degraded significantly in the 1950-60s, as in the rest of the developed world. Since the 1980s, however, it has been improving for some aspects, e.g. with regard to some nutrients (phosphorous) and locally some heavy metals. Since 2000, the EU water framework directive has established several targets, including the good ecological status of all surface and ground water bodies. It has also introduced the principle of preventing any further deterioration of status, which should encourage sustained efforts.

Only a tiny fraction of what makes up "water quality" is usually measured, i.e., mainly nutrients. Many other elements that are known to influence water quality (e.g., pesticides, Polychlorobiphenyls (PCBs), Polycyclic aromatic hydrocarbons (PAHs), hormone-like substances, medicines, and nano-pollutants) are little or not at all monitored, in the whole region. This is unlikely to change rapidly: at least in the middle term, assessments of water quality at the Mediterranean scale will remain restricted to only a few elements. Similarly, it will remain focused on those types of wetlands (i.e., rivers, lakes, groundwater, and lagoons) that have been attracting most attention so far, whereas other wetland types would require large efforts to be covered as well.

II.2. THE KEY CHALLENGES FOR MEDITERRANEAN WETLANDS

What are the key issues faced by Mediterranean wetlands and the people depending on them?

This section is aimed at making the current situation of Mediterranean wetlands explicit by correlating the information resulting from different MWO indicators (Main report, chapter II), and by highlighting their cause-consequence relationship as well as the specific responses. This analysis is reflected through three storylines focused on three key features for wetland conservation and wise use: (1) water management, (2) policies and development models, and (3) coastal zone management. These storylines lay the ground for future broader decisions and actions at national and regional levels. It is important to refer, for details and breakdown of analysis, to the complete monitoring and evaluation information contained in the main report[5], and in the indicator fact sheets attached herewith.

5/ *Main report, chapter II: MWO results: status and trends of Mediterranean Wetlands*

A. Wise wetland management

Wise wetland management is necessary to secure a sound and sustainable water availability and supply in Mediterranean countries

The situation: a decrease in water available for the ecosystems, and a poor monitoring of water quality

Reghaia lake, Algeria

Agricultural canals, Gediz delta, Turkey

The indicator "Surface area of Mediterranean wetlands" shows that c. half of Mediterranean wetlands have disappeared during the 20th century, largely through drainage for agriculture and urbanization. Currently, there is less water available in natural ecosystems, due to water abstraction for human uses (see Indicator factsheet 4). These two results quantify the regression of wetlands, both in the number of wetlands and in the availability of one of its key components, water.

As far as water quality is concerned, contamination is still a major problem for inland and coastal waters, despite improvements for some substances like nitrates or phosphates, mainly in the European rivers. Little is known about other types of less-easily measurable contaminants (pesticides, PCBs, and hormone-like substances). Ground water over-exploitation also generates salinization problems in aquifers.

Main cause: Inappropriate water management is currently the main problem for the Mediterranean wetlands

The overexploitation of natural water resources is mainly driven by the demand for irrigation, especially in the most water-poor countries (Fig 6).

Water quality is influenced by many chemical components which largely result from various human activities, including nitrates from intensive agriculture, phosphates from domestic sewage, and numerous constantly evolving contaminants from industrial activities. The growing diversity of contaminants increases the risks for biodiversity and humans through various processes, such as the long persistence in ecosystems, bioaccumulation along the trophic chain, effects at low concentrations, cocktail effects, and effects on reproduction.

The water mismanagement in the region results in high losses: networks are old and not well-maintained, agriculture practices are not well-adapted (highly water-consuming irrigation practices and growing crops requiring great amounts of water in arid environments). The estimated average losses between extraction and use are ca. 40% and improvement of

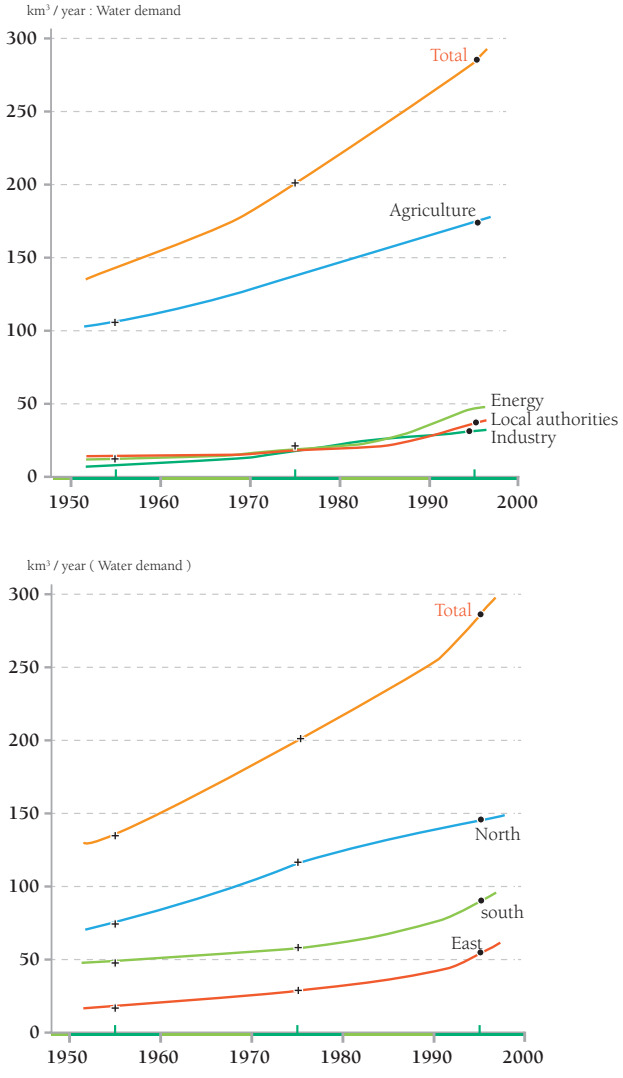


*Fig. 6. **Water demand per sector and per sub-region in Mediterranean countries overall in the 20th century.** Source: Margat & Treyer 2004*


Greenhouses, Biskra, Algeria

practices is slow. Water policies are still based on supply rather than on demand in most countries. Obviously, demand driven policy requires a more substantial change in individuals' behaviour in water consumption and management.

Moreover, there is often an inefficient coordination between the various economic sectors and government bodies dealing with water, making integrated approach and management for water saving options difficult.

Consequence: there is a decrease in easily-available water for humans

Generally, in the Mediterranean, both the quantity and quality of water available for humans are decreasing. With a 92% rate of renewable surface and groundwater withdrawal, North African countries have already exceeded their sustainable limit of water abstraction. Water over-exploitation and poor water quality have consequences on the ability of wetlands to maintain their services, and on people capacity to pay water services in order to sustain and to develop their livelihood at reasonable cost: costs for processing and delivering drinkable water are increasing and rapidly depleting aquifers increase the extraction costs-when extraction is still possible.

This situation may particularly affect the poor people on the following aspects: (1) less capacity to access water services and to fulfill their basic needs; (2) less possibility to irrigate their field at affordable cost, impacting on production cost, income, and food security; (3) use of poor quality water further impacting on human health.

Solutions do exist

A more efficient coordination of the water policies and an appropriate governance at the national or watershed level associated with a shift from "supply" to "demand" water policies should speed-up the improvement of the water management situation. The EU directives, and especially the Water Framework Directive, are very demanding in regard to ecological requirements. To reach these objectives would imply new governance modes (Integrated river Basin Management). The lessons learned from EU countries, Israel and Tunisia may help to pave the way to get a real cross-sector coordination of water issues in the Mediterranean region.

A major step for reducing and rationalizing water exploitation would be to reduce the huge water losses, and to further adopt water-saving technologies and practices. Finally, restoring wetlands and taking into account water needs for the ecosystems would be a way to ensure aquifer recharge, water purification and sustainable use. For this reason, wetlands located in floodplains or rivers are of special importance. Feasibility should of course be evaluated in relation to local conditions such as topography and soil.

B. Policies and legal frameworks

The design and enforcement of more efficient policies and legal frameworks are mandatory to address continuous loss and degradation of wetlands and their biodiversity homogenization

The situation: an ongoing loss of wetlands and Mediterranean character of biodiversity

The conversion of wetlands into agricultural and urban land led to the degradation and fragmentation of wetlands at such a large scale that large, intact freshwater ecosystems have virtually disappeared from the Mediterranean.

For most species, it is unlikely that original abundance levels (before the industrialization period) will be reached again. Larger species, and especially predators, were decimated in most of their Mediterranean range as they competed with human activities or represented a danger. Today, the demographic pressure and the fragmentation of remaining wetland ecosystems do not allow their come back.

The overall biodiversity decline is still on-going in the region for non-avian fauna, especially for amphibians and freshwater fish. On the other hand, many waterbird species are doing better. Large and emblematic species, including flamingos, ibises, herons, geese, cranes, pelicans, which raised the initial interest of the conservation world are increasing again, at least locally. Some aquatic mammals are also making local come-backs in European rivers (otter, beaver).


Yellow-legged gull

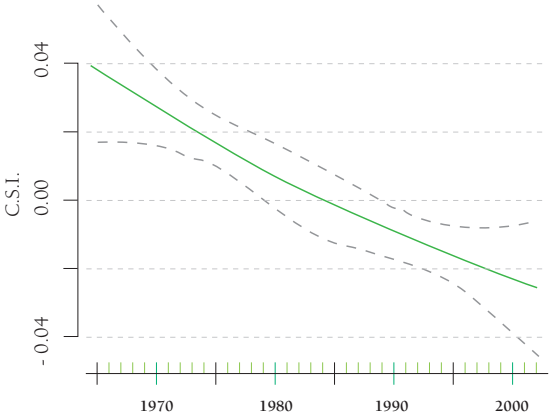


Fig. 7. ***Community Specialization Index for Mediterranean wetland birds****. The relative abundance of species specialized in only one or few habitats has decreased since 1970, whereas generalist species that can occupy a wide range of habitats have increased. This trend reflects a change in land use that negatively impacts the biodiversity of wetlands.*

However, a more detailed analysis reveals that the species increasing the most are often generalist species, able to cope with both degraded ecosystems and yellow-legged gulls. Climate change is another parameter, aggravating the perturbation of animal communities by filtering species according to their tolerance to hot temperatures and progressively eliminating cool-temperature dwellers. Among thriving species, there are non-native, invasive species which sometimes represent a major threat for the biodiversity endemic to the Mediterranean. The result is an on-going process of homogenization of biodiversity affecting Mediterranean wetlands (Fig 7). In other words, a few common, generalist, widely distributed and sometimes exotic species are largely increasing in numbers whereas many rare, specialist, or endemic species are increasingly threatened with extinction.

Main cause: non-sustainable human development models

The loss of biodiversity as measured through impoverished and homogenized communities can be directly related to the conversion, including destruction of natural wetlands and surrounding habitats. The national ecological footprint indicator calculated in 2007 for each Mediterranean country exceeds - except for Montenegro - each national biocapacity, suggesting that Mediterranean countries are following non-sustainable development and human consumption models.

The huge development of coastal cities (e.g., Cairo, Egypt), airports (e.g., Barcelona, Spain), harbours (e.g. Marseille, France) and tourist resorts (e.g., Faro area, Portugal) caused the drainage of large surfaces of wetlands in past decades. Even if the overall surface of agricultural land stabilized between 1961 and 2005, the pressure on suburban agricultural land due to urban sprawl and 'littoralisation' provokes a displacement of agricultural land onto natural and semi-natural areas, which is known as 'spatial sliding'.

Many wetlands are drying out due to the over-consumption of water that occurs in most Mediterranean watersheds except in the Balkan area. The "River flows" indicator (see Indicator fact sheet 4) suggests a clear decrease in the water available for the ecosystem.

The multiplication of dams, reservoirs (Fig 8), and river embankments, the overall decrease of water quality, or the introduction of exotic plants and animals, even when they do always cause the destruction of wetlands, often provoke their degradation, making them eventually less suitable for biodiversity.

An ever-growing proportion of wetlands is either artificial or artificially managed for the requirements of human activities (irrigated agriculture, fishing, hunting, salt production etc.). This management does not reproduce the original hydrological functioning of Mediterranean wetlands, which is characterized by higher ecological variability. Rice fields, salt pans and hunting marshes are flooded in summer, a season characterized by water-shortage in the region, while reservoirs and fish ponds are permanent water bodies. Consequently, common, generalist species, which are not typical of Mediterranean freshwater ecosystems, thrive in those artificial wetlands. On the other hand, artificial wetlands also benefit some components of biodiversity.

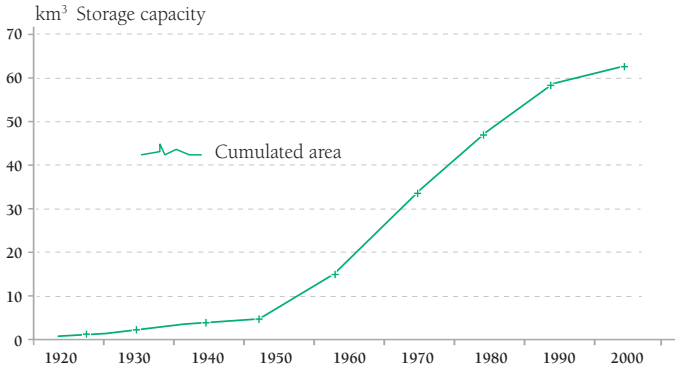


Fig. 8. ***Total water storage capacity of reservoirs (in km³) in 9 Mediterranean countries in the 20th century*** *(Albania, Algeria, France, Greece, Italy, Morocco, Spain, Tunisia, and Turkey; data for 2000 are incomplete and thus mere minima). Source: calculated based on Margat & Treyer 2004*

Sidi El Barrak dam, Tunisia

Consequence: the decrease in wetlands services also reduces benefits for people

The loss of ecosystem services is expected to be proportionate to the change of wetlands, both in terms of surface and quality/functioning. The most dramatic changes in ecosystem services brought by biodiversity are likely to come from the altered functional composition of animal and plant communities. Indeed, the loss of some species and habitats - because they become locally extinct or they become so rare or reduced in extent that they are "functionally" extinct - may have large, unexpected, irreversible consequences, with potential environmental, economic, and cultural losses.

For instance, in Mediterranean rivers, heavy organic and chemical loads due to domestic sewage and discharge of nitrogen, phosphorus, organo-chlorides and heavy metals favour the species with the highest tolerance of polluted water. There is a tendency for the fish community to change from one dominated by salmonids - called "game" fish, very much appreciated by anglers - to one where coarse fish predominate, which are much more tolerant to low oxygen conditions, but of less value for sport fishing.

Services directly depending upon healthy species communities include fishing, reed-cutting, hunting, sustainable tourism, and education. Wetlands also contribute to even more essential services like food security, water supply, supply of local construction materials, and water purification. The wise use and appropriate management of those services maintain these advantages human get to sustain their livelihood and well-being. Some wetland services also decrease human vulnerability in case of food deficiency (increasing gathering and fishing activities), or in case of extreme climate circumstances (drought and flood attenuation effect of wetlands). On the other hand, the degradation of the natural capital and functioning of ecosystem services may impact negatively on their physical (i.e., land), financial (i.e., income from production), and in some cases social (cultural) capital.


Fisherman, Montenegro


Yumurtalik Lagoon, Turkey

Solutions do exist

Positive signs are already visible, following conservation actions over recent decades.

While there is still an ongoing loss of wetlands, efforts made by local, national, and international stakeholders allowed the increase of the number and surface of protected areas and designated Ramsar sites in the last decades. The Natura 2000 network has been the most efficient mean for speeding-up the increase of protected areas in EU countries. The Ecological Network instrument has proven to be an efficient mean to prepare future Natura 2000 protected areas in the course of EU accession process of countries such as Croatia, Albania, and FYR of Macedonia. Reinforcing positive effects are recognized when these protected areas are internationally labeled World Heritage, MAB or Ramsar. In these recent positive trends, both national and supra-national legislation were involved (e.g., the Birds and Habitats Directives in the EU and in candidate countries).


Souss Massa Park, Morocco

Everywhere, there is a need to improve the conservation of habitats which are so far insufficiently included in protected areas like smaller and seasonal wetlands, typical of the Mediterranean. The terrestrial habitats surrounding wetlands are also crucial for many freshwater species - like amphibians - when moving from a water body to another, or for part of their life cycle. However, these buffer zones are too often absent from management considerations. Since 1996, besides new criteria, one of them allows countries to designate as Ramsar sites wetlands which have no value for waterfowl, but have great value for fish or other groups. Such an inclusion is a very positive step towards the preservation of a larger diversity of wetland ecosystems, and might improve the conservation status of species specialist of these habitats.

Large, attractive waterbirds have benefited from targeted measures since the 1960s-70s. They included legal protection of both species and key sites (nature reserves and national parks), reintroductions, targeted wetland management, and

awareness raising. Likewise, the demand for more rational hunting practices together with the adoption of specific management measures have enabled large populations of game birds (ducks and coots) to stabilize, and in some cases even increase. A few other wetland-related species too have benefited (e.g., the beaver). Some migratory fish are also benefiting locally from mitigation measures to remedy the obstacles (e.g., dams, dykes) that have artificialized their habitat in the 20th century.

The possibility of restoring degraded wetlands provides further hope. Experiments are underway in the Mediterranean. Nevertheless pristine wetland ecosystems are impossible to restore: the level of biodiversity and ecosystem services after restoration is lower than before the degradation. However, wetland engineering can at least help to re-establish part of the biodiversity and some associated services.

In most Mediterranean countries, the **local development planning system** is an emerging opportunity to better integrate the environmental dimension in land-use and development options. This can benefit wetland protection in both protected and non-protected areas. This ascendant, medium-term integrated planning process initiated at local level is already officialized in EU countries, Morocco, and some Balkan countries, and under development in Tunisia, Algeria, Lebanon, Jordan, and Syria. Since 2000, several bilateral, regional and international organizations have been supporting this initiative. For the period 2011-2020, the CBD incorporated the concept of 'integration of biodiversity target' into national and local development planning. At the national level, as initiated in Morocco, conservation experts and managers should participate more actively in the early stage of the local development planning process in order to introduce appropriate environmental methods and strong environmental assessment. Governments, especially ministries in charge of overall land issues, could facilitate the institutionalization of this planning instrument after the test period, such as in Algeria, Tunisia and Lebanon.

Additionally, policies and legislation aiming at improving water quality helped mitigate the causes of wetland degradation, especially in EU and Organization for economic cooperation and development (OECD) countries. The improvement of some components of water quality, as observed now in Europe, assists the recovery of animal and plant communities, through the natural comeback or reintroduction of species which went locally extinct due to pollution (e.g., otter).

These responses need to be reinforced in parts of the Mediterranean. There is a need to better enforce existing protection laws in many countries, especially in the East and South Mediterranean countries, in particular against illegal fishing, hunting, agriculture and settlements in protected wetlands. For instance, uncontrolled hunting and poaching are suspected to be the main causes of waterbird declines observed in Albania, Bosnia and Herzegovina, Croatia, Cyprus, Egypt, Lebanon, Malta, and Syria.

Grey heron

C. Integrated coastal zone management

A much greater speed in integrated coastal zone management is needed to address the mounting pressure on the Mediterranean coastal belt

The situation: coastal wetlands lost much more surface than inland wetlands

The Mediterranean coastline used to harbour many huge wetland complexes. Still today, some of the largest remaining wetlands are found along the coast, e.g., the Nile delta in Egypt, the largest of them all with over 2 million ha. This coastline is also a strategic area for humans and concentrates a large part of the Mediterranean population, as well as most of the current regional demographic growth. This phenomenon is similar on all three shores, and it has impacted Mediterranean wetlands for a long time. Large areas have been drained, and this began as early as the Roman times in Italy. The process continued e.g. during colonial times in Algeria (the Mitidja plains) or Morocco (the Gharb plains). Between 1800 and 1990, Spain lost a similar percentage (60%) of both coastal and inland wetlands. But in absolute terms, because of their initial larger extent, coastal wetlands lost much more surface area (over 140,000 ha) than inland wetlands (c. 24.000 ha).

saïdia, Morocco

Coastal urbanization, Morocco

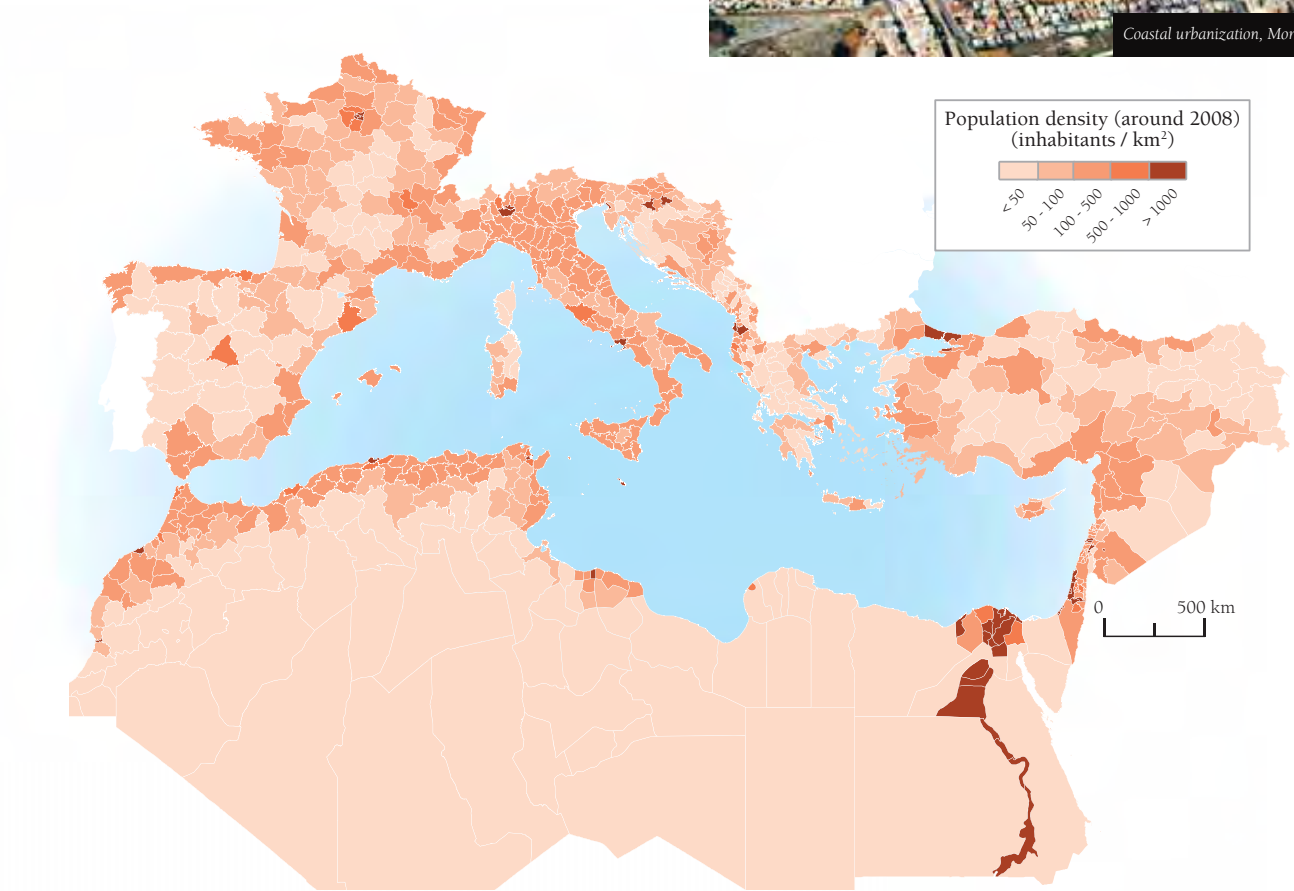


Fig. 9. **Population density in provinces/departments/wilayas around the Mediterranean in 2008.** Source: Plan Bleu from national sources

Main cause: increasing population density and economic activities

Initially, wetlands were reclaimed for sanitary reasons (malaria and other water-related diseases), and to provide farmland and housing space. Over time, new factors often economically driven, have appeared: besides agriculture, the development of infrastructures for the industry, tourism, and transport including airports has expanded, with more intensity along the Mediterranean coasts due to demographic concentration and increase of Mediterranean trade and exchange (Fig 9). Tourist developments sprung up immediately next to (or even inside) coastal wetlands in France and Spain from the 1960-70s onwards, and in the rest of the Mediterranean more recently. This process is continuing in the 21st century in many areas (e.g., the coast of Egypt, the Moulouya estuary in Morocco, etc). This development was deemed necessary in order to harbour the ever-growing number of tourists: the Mediterranean is the world region receiving the largest number of international visitors each year - 30% of the worldwide total.

Further pressures are indirect, and come from far upstream. For instance, dams on large rivers as well as erosion-fighting policies in watersheds have drastically reduced the sediment load in large rivers that reach the coast, contributing to the loss of coastal wetlands like deltas and lagoons. Dams have also broken biological connections along rivers, from upstream to their mouths, thus affecting populations of migratory fish, molluscs, etc.

Consequences: degradation and loss of wetlands functions that benefit human societies

This pressure on coastal wetlands had several consequences. Besides losses in biodiversity and biotic homogenisation, many functions which are important for humans were also reduced. Coastal protection is weakening due to erosion, which will become all the more serious with the predicted climate change and sea-level rise. For instance, the progression of many deltas onto the sea - which still prevailed 50-100 years ago - has often been replaced by regressive erosion.

Coastal aquifers are also becoming increasingly saline due to sea-water intrusion, since the vanished freshwater wetlands no longer replenish groundwater, which is itself often over-exploited.

Solutions do exist: effective policy, territorial and institutional integration in land use planning and monitoring

Although Ramsar sites are evenly spread between the coastal belt and inland area, a MWO analysis of protected areas, so far limited to 3 countries in SE Europe, has shown that coastal wetlands are more protected, proportionately, than inland wetlands. Similarly in France, almost one quarter of the coastal strip is covered by at least one protection measure, versus less than 14% for the national territory overall; the Mediterranean coastline being the most protected. In some countries, this can be partly related to more proactive - though recent - conservation strategies (e.g., Integrated Coastal Zone Management), applying to coastal and marine zones, due to their higher vulnerability and higher human stakes (e.g., economic interest and climate change issues).

Similarly, a number of coastal wetlands have been partly restored (e.g., Aiguamolls de l'Empordà in Catalonia, Spain). Finally, some pollution-fighting measures, especially encouraged under the Barcelona Convention, applied nationally appear to bear fruits downstream as well, in coastal areas. For instance, pollution levels carried out to the sea by large rivers are currently declining for several pollutants (nutrients, heavy metals, etc.), at least in the North Western Mediterranean.

However, beyond these local responses, a more integrated conception of the management of coastal areas is increasingly needed. A serious issue to be addressed in the face of climatic change is adapting societies' responses to the rise in sea level, with all its potential impacts on the coastal zone: wetlands, towns, agriculture, and industries. Land-use planning should therefore integrate the principles of Integrated Coastal Zone Management, as promoted by the Barcelona Convention, inside which a specific protocol recently entered into force, the first legal instrument on this issue at the global scale[6]. Better application of Integrated River Basin Management is also required, because key issues such as coastal pollution or sediment transfer to coastal areas largely depend on management options often made hundreds of kilometres upstream of the Mediterranean Sea.

South Magne creek, Greece

6 /http://195.97.36.231/dbases/webdocs/BCP/StatusOfSignaturesAndRatifications.doc

PART
- II -

35

Tiger valley, Hasankeyf, Turkey

PART III.

CAUSES OF CHANGES IN MEDITERRANEAN WETLANDS

Cotton fields in the Gediz delta, Turkey

III.1. ROOT CAUSES OF CHANGES

Several interrelated root causes often impact wetlands. The review of literature, macro indicators, and cross-cutting issues shows that most of the pressures identified at the wetland level, as summarized in chapter III.2, result from "upstream (or "root") causes". They act at the country and regional levels, and among them are:

- Policy, strategy, legal framework, and political agenda, as well as the influence of supra-national agreements and policies;
- Regional and national governance;
- Nature of national economic sectors and development model (i.e., agriculture, industry, and services) influencing changes in land and water use;
- Demographic density and growth
- Climate change

III.1.1. POLICY, STRATEGY, LEGAL FRAMEWORK, AND POLITICAL AGENDA

Policy, strategy, and legal framework

Policies, strategic orientations, and legal instruments can be both causes of and responses to pressures on wetlands. We will limit our analysis to the causes.

Insufficient impact-based policy and strategic orientation

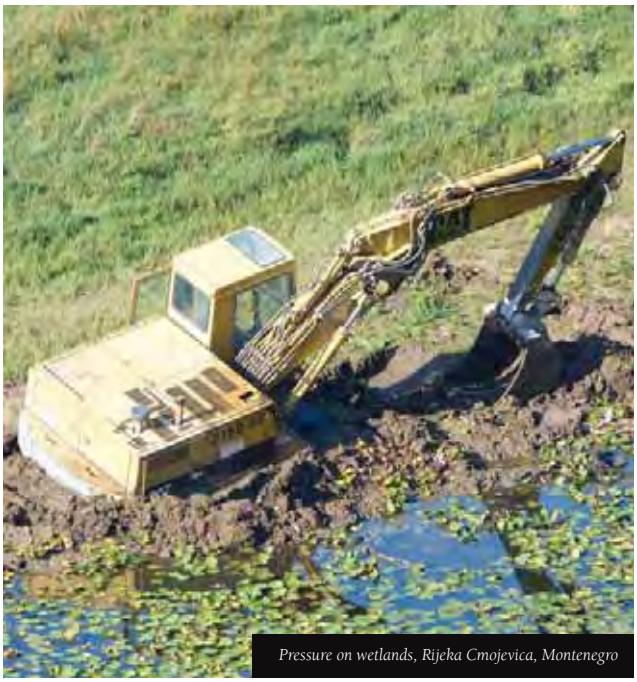
Conservation policies and strategic orientations often lack medium and long-term vision that is shared among stakeholders active in conservation and development matters. Policy and operational targets are usually quantifiable only in terms of e.g. surface of protected areas, number of training programmes and seminars conducted, and learning centres established. The concept of impact (i.e., how nature and people have benefited or lost, overall, from the actions undertaken)[7] is still in its infancy in policy frameworks. Is biodiversity change good for the wetland ecosystem integrity? Do local communities value wetland services as ways to help enhance their livelihoods? As a consequence, and without a common vision and understanding of what policy and strategy want to achieve for the protected wetland ecosystem and biodiversity, their implementation remains largely segmented by waterbirds, fish, water, ecotourism, and other activities, without any shared agreement about whether it is good or bad for the wetlands considered. In this situation, without impact-based policy, everyone may use his/her own intermediary and segmented judgment regarding impact, with no shared view with other sectors.

Poor enforcement of protection laws

At policy and legal levels, the main bottleneck at the Mediterranean scale towards better conservation of wetlands is less the number and quality of documents than their degree of enforcement. About 75% of interviewed wetlands stakeholders from eastern and southern countries of the Mediterranean mentioned that protection laws are not always/not often enforced, especially against illegal fishing, hunting, grazing, and cropping. The main reasons reported were insufficient budget, staff, and vehicles (MWO, survey 2011).

Monitoring of biodiversity concludes that uncontrolled hunting and poor habitat protection are probably the causes for the decline that affects waterbirds in the Eastern Mediterranean. Poaching pressure is still high in many countries like Albania, Bosnia and Herzegovina, Croatia, Lebanon, Syria, Egypt, and Cyprus partly due to weak legislation and/or poor law enforcement.

The conversion and degradation of natural wetlands is still continuing, due to poor enforcement of urban planning and building requirements, illegal encroachment, transport development, drainage for agriculture, and pollution. This situation partly results from inadequate policy and legal instruments, as well as inefficient enforcement and coordination. In addition, in some cases, a lack of political will is obvious.



Pressure on wetlands, Rijeka Crnojevica, Montenegro

7 / *There are different interpretations of the term 'impact' and of the analysis processes leading to impact between the DPSIR model (conservation angle) and socio-economic/livelihood methods (socio-economic angle). Driver, State, and Pressure are the steps needed to analyse impact according to the DPSIR model, while input, results and outcomes (including links between causes and consequences) are the processes for analysing impacts in socio-economic development. In the socio-economic model, ultimate impacts are changes in the economic and social status of people.*

Inadequate policies and strategies for water and coastal management

The unsustainable use of water resources usually results from the lack of a comprehensive water management policy and environmental consideration in water use and management. Most Mediterranean countries lack comprehensive water policy, except in Israel, Cyprus, Malta, France, and Tunisia. The insufficient integration in water management policy across sectors is also correlated with the inefficient coordination between the administrative institutions involved in water management, at national and local scales. For instance, only eight countries (32% of MedWet countries surveyed) have both a wetland policy and a national wetland committee, and even having them both does not mean that they are fully functional, and is no guarantee of a safe future for wetlands. Consequently, in most countries, the approach to wetlands and water issues remains highly fragmented between sectors, especially in non-EU countries.

The ICZM Protocol, which was signed in 2008 by most Mediterranean countries and entered into force on 24 March 2011, may encourage further initiatives, including the improvement of national water and coastal-related policies. At the start, its implementation may face current or prevailing sectoral and sometimes not well-coordinated planning practices ongoing in most countries, and priority economic development agenda and interests (urbanization and tourism mainly), superseding other sectoral planning.

Territorial planning divides between protected and unprotected areas

Territorial planning suffers from a lack of mainstream planning and coordination between protected and unprotected areas. Indeed, planning in protected areas is usually done by different specialized institutions and agents, who are different from those acting in unprotected areas. The methods, terminologies, and objectives also differ. Consequently, in several communes and municipalities whose land is shared between both protected and unprotected areas, this territorial segmentation in planning does not fit with the socio-economic and environmental reality of the actual territory. This results in tensions over access to, and management of, the natural capital between local communities, local governments, and sectoral ministries in charge of wetlands. In the end, if local communities do not perceive their interest in protecting wetlands, the natural capital, including wetlands, usually lose out due to encroachment, illegal hunting, fishing, gathering, and grazing activities. This situation is more acute in some North African and Middle-Eastern countries in which there is a strong protected-unprotected area management divide. In this situation, when park managers enforce the law in protected areas, they are sometimes perceived as obstacle to development by the local population and authorities. This may explain the status and trends of biodiversity and why some wetlands are currently being degraded, despite being protected, either through direct degradation or effects from surrounding degradation.


MedWet meeting, Corsica, France

Insufficient monitoring requirements in policies

Conservation and development policies and strategies still do not always include mandatory regular monitoring framework, even if the situation improves in EU countries.

In 85% of Mediterranean countries, systematic wetlands monitoring takes place in the main protected wetlands of international importance. In developing countries, most monitoring activities implemented are short-term, project-based, and supported by international funding agencies. Outside the main protected areas, there is almost no regular monitoring organised, especially in the Southern and Eastern Mediterranean countries. For wetlands specifically, there is poor and heterogeneous monitoring of water, species, and habitats at the Mediterranean basin level. The waterbird component is the most robustly monitored element at the Mediterranean level. The main limitations of the existing monitoring are the insufficient collection of data on wetland habitats, local socio-economic and ecosystem services, the lack of data analysis in a broader context, the poor communication of results, and thus the inadequate use of them (lessons learned) for subsequent planning and implementation.

Furthermore, while monitoring does take place at national, EU, and international levels, data are not always publicly available, or easy to obtain. In terms of water issues, it is thus difficult to have a broad view of the water quality in the region. Furthermore, monitoring of water is usually neither comprehensive nor harmonized between countries and institutional stakeholders, except in the EU where the Water Framework Directive strongly pushes for compatible monitoring protocols. In the EU and candidate countries, ongoing improvements in some aspects of water quality are mainly driven by the implementation of binding legislation. EU legislation relevant to water quality monitoring in terms of discharge of pollutants, wastewater treatment, and fertilizer use has been strengthened over the past 30 years, following public pressure stemming from major pollution events, especially eutrophication. This process culminated in the Water Framework Directive, which was adopted in 2000.

Political decisions

In this context, the term 'political decision' is understood as the decisions taken by governments to define priorities in implementing their sectoral policies. For example, Egypt made a clear choice to include development and conservation policies under the umbrella of poverty reduction. Syria made a choice to ensure national food security, while the priority political agendas of Morocco and Albania are mainly driven by employment and income targets. In EU countries, the negative impact of the financial crisis on employment and national economic growth has postponed or cancelled some prior commitments toward environmental measures, and has included budget cuts. It is doubtful that the environmental political agenda will be enhanced in the short term in Arab countries facing revolutions, since these events were mostly based on employment, economic, and governance considerations.

Given the current financial and security situation in the Mediterranean, and the subsequent potential economic and social impacts, policy decisions on the environment including wetlands may not improve significantly in the near future. Lessons from Mediterranean countries show that political decisions to protect wetlands were encouraged when the national freshwater stock was at risk (e.g. in Israel). Decisions were also taken when countries were committed to implementing targets from supra-national conventions or agreements such as the CBD, Ramsar Convention, Barcelona Convention, and UNESCO (World Heritage, MAB) (i.e. Croatia, Egypt, and Algeria). It has also been the case when an environmental instrument has been recognized as efficient by local and central governments, usually based on civil society commitment (Natura 2000 in EU countries, and the Ecological Network instrument in the Balkan countries).

III.1.2. GOVERNANCE AND STATUS OF COUNTRIES

Governance, either supra-national, national or local, is one of the root causes - or responses - that impact social, economic, and environmental management and performance. Governance encompasses several dimensions, including organizational and institutional structures, administrative and implementation efficiency, participation, and transparency. The governance system and the economic and human capacities are also correlated to the status of countries. Four causal dimensions of governance are highlighted here because of their particular relevance to wetlands.

Development status of the countries

Developed countries (EU) started their industrialisation and democratic and decentralised governance before the other countries in the Mediterranean, still classified as developing and emerging countries in the international development context. Governance is evolving in each country, based on its specific historical background (cultural, institutional, political, etc.) and willingness to adopt a certain governance model. Governance in developing counties is also influenced by international and regional cooperation agreements, and particularly by the conditions of access to international assistance. Following the Paris Declaration on aid effectiveness (2005), the donor community and government officials made a commitment to meet regularly on strategic cooperation and thematic issues: the priorities agenda, budget gaps, aid harmonisation, and monitoring framework are discussed.

Based on the analysis of some macro-indicators for the countries indicated below, it has been established that the current biodiversity trends measured by the Living Planet Index and CBD/MDG indicators are correlated with the Mediterranean countries' human and financial capacities and resources. Resources and capacities to effectively protect wetlands are particularly correlated with the level of development (Human Development Index, HDI), Gross Domestic Product (GDP) per capita, and the nature of the economy. In general, countries with a high HDI and GDP per capita, and with a developed service economy, have elaborated integrated environmental and legal frameworks, as well as the governance structure and resources that allow better protection of their habitats and natural resources, irrespective of their population density. Conversely, developing countries with a relatively high proportion of agriculture and/or industrial sectors and with lower GDP per capita have less effective governance structures, and less capacity and resources to protect their natural resources. Several environmental activities, including wetland policy and strategy, wetland management plans, and capacity building have been initiated and financed by international funding sources (i.e., in Morocco, Tunisia, Albania, Lebanon, Bosnia, and Herzegovina).

Inefficiency of the coordination and inter-sector mechanisms

Institutional, geographical and technical coordination between stakeholders working in or impacting wetlands is improving in the Mediterranean Basin. However, inefficient coordination mechanisms are still important causes of wetland degradation, especially in some southern and eastern countries of the Mediterranean, where a rather top-down sector approach is in use with limited decentralised governance and poor representation of civil society and NGOs. In this situation, coordination usually takes place within each sectoral ministry from central down to local level, with relatively poor institutionalized and operational cross-sector coordination. Local administrative bodies may also not be fully in control of priority local decisions, which remain within each ministerial sector and sectoral budget. Consequently, the environment is usually not really considered as a fully-fledged cross-cutting issue, and has poor "sector" weight compared with the higher state budget for irrigation and drainage programmes (i.e., impacting wetlands and water), roads (modifying wetlands' hydrological systems) and urban development (increasing land fragmentation). Several environmental and wetland public institutions have reported that they are usually not consulted at the planning stage and called upon by the other sectors only at the implementation phase, to help solve environmental problems and social conflict (MWO survey, 2011).

Poor implementation of wetland policy and strategy

In 2011, about 64% of Medwet countries have established a national wetland policy or strategy. However, only half of them (32%) have a wetland cross-cutting committee potentially able to influence other sectors. In southern and eastern Mediterranean countries, about 70% of the wetland decision - makers interviewed (MWO survey, 2011) indicated poor implementation of wetland policy and strategy due to several reasons including governance. The causes reported are a lack of mainstreaming between conservation and development agenda, poor conservation priorities, insufficient coordination, delays between policy action and implementation, and insufficient authority over key conservation agenda issues. Funding and human resources in the environmental sector are usually the main limiting implementation factors, especially in developing countries where the environmental budget represents between 0.3 and 3% of the national budget. The consequences of a protection status without conservation implementation may be counter-productive for wetlands (Box 3).

3. Consequences of delayed implementation of conservation initiatives in newly created protected wetlands

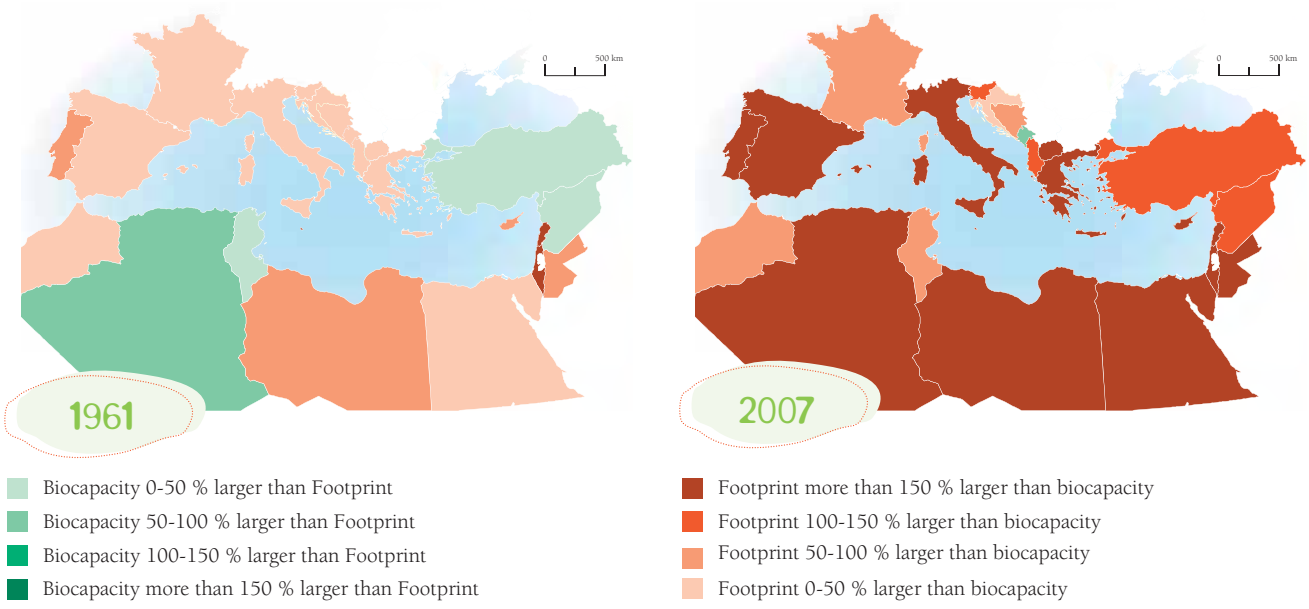
A designation of protected wetland without quick implementation of protection measures and guidance may lead to three consequences negatively impacting wetland ecosystems and biodiversity:

(1) less use or abandonment of indigenous conservation practices by local communities, who consider that the state takes over this responsibility;

(2) attempts by individuals to grasp as many natural resources as possible before the state is sufficiently organised to control and protect them;

(3) encroachment through cropping and settlement for future land reclamation and compensation.

III.1.3 DEVELOPMENT AND CONSUMPTION MODEL



Biocapacity surplus (green) and deficit (Brown) status of the Mediterranean countries.

Biocapacity surplus is defined as a domestic Ecological Footprint of consumption lesser than domestic biocapacity; biocapacity deficit as an Ecological Footprint of consumption greater than domestic biocapacity.

*Fig. 10 : **Mediterranean ecological footprint map[8]:** Consumption and biocapacity balance for countries in the Mediterranean region in 1961 and 2007. All countries ran ecological deficits in 2007, except Montenegro. (Global Footprint Network, 2011)*

Each country has embarked upon a unique development and consumption model, based on several criteria, including its political priority agenda, national and per capita financial capacity, human capacity, natural resources, traditions, and social values.

The most widely utilised international indicators for comparing the development levels of countries are the Human Development Index (HDI), the Gross Domestic Product (GDP) and the GDP per capita. The objective of "developing-economy and emerging countries" is to reach a 0.8 HDI value Index, while developed-economy countries are now aiming at an index value of 0.9 and above. Most countries with a high HDI and GDP per capita started their industrialisation process a long time ago, and base their development model today on the service economy and high technologies. On the contrary, most emerging and developing-economy countries started their industrialisation process after 1960, and still have a relatively high proportion of agriculture and/or industrial sectors with lower technologies. The higher level of salaries and purchasing power allows much more consumption in developed countries than in developing-economy countries.

8 / Source : "Moore, D., Brooks, N., Cranston, G., Galli, A., 2010. The Future of the Mediterranean: Tracking Ecological Footprint Trends. Interim report for Comments. Global Footprint Network, Oakland. Available On-line at http://www.footprintnetwork.org/med [accessed May 2011]"

Development and consumption models have an impact on natural resources including wetlands, on the intensity of construction and agricultural development, land and water demand, production of waste, and so on. The ecological footprint indicator, developed recently for the Mediterranean Basin by the Global Footprint Network (2010), can be used to compare countries in terms of their consumption models. This indicator aims to estimate how much of the planet's or country's regenerative capacity is demanded by human activities, such as eating, moving, the provision of shelter, and use of goods and services. It measures the biologically productive land and water required to produce all the resources a population consumes. This is then compared to the biologically, productive land available as measured via the biocapacity indicator.

In the Mediterranean (Fig.10), the ecological footprint calculated (2007 value) exceeds biocapacity in all countries, except Montenegro. Between 1961 and 2007, the Mediterranean region experienced an increase in average per capita ecological footprint (+ 48 percent), reaching 3.3 global hectares in 2007, and a decrease (-35 percent) in the region's average biocapacity, which reached 1.2 global hectares per capita in 2007.

These indicate that the Mediterranean populations are consuming more resources than those available in the region, and that their consumption patterns are not globally replicable in a sustainable manner. While the highest national ecological footprint is recorded in Spain, France, Italy, and Turkey show the highest biocapacity to sustain their footprint. FYR of Macedonia, Spain, Greece, and Slovenia have the highest ecological footprint per capita in the Mediterranean Basin (over 5 global hectares per capita), while Palestine, Montenegro, Morocco, Syria, Algeria, Egypt, Albania, and Jordan are below the per capita world average ecological footprint (2.7global ha). In Montenegro, clearly, this performance is correlated with the low population density (45 pers./Km^2) combined with a high proportion of global bio-productive land in the country (Global Footprint Network, 2010).

The analysis at the Mediterranean scale shows that the development models adopted since 1960 are not environmentally sustainable overall. Poor countries may not be in the position to import the resources and services necessary to avoid ecological overshooting. Rich and emerging countries (oil and gas producers such as Libya, Algeria, and Egypt) are currently able to reduce or avoid somehow their national ecological overshooting by importing the resources and ecological services from outside the region. In the short-term and rather vulnerable situations, natural and semi-natural ecosystems, including wetlands, may be further overexploited if there is reduced financial capacity to import resources and services from outside the region due to financial and economic crises, increased debt and increasing prices of resources. In the medium and long-term, there is a serious need to embark upon a more sustainable development model, including the adoption of water, energy, and waste saving techniques. However, further actions must be taken now.

III.1.4. DEMOGRAPHY

Demographic pattern in the Mediterranean is characterized by a relatively high density variation within territories and important seasonal fluctuations.

In 2010, the total population in the region was estimated at 505 million (7% of the global population), ranging from 33,000 inhabitants (Monaco) to 80 million (Egypt). The 27 Medwet countries and Kosovo cover 8,728,860 km^2, ranging from 1.95 km^2 (Monaco) to 2,381,740 km^2 (Algeria). The average regional population density (57.9 pers./km^2) is above the world average (49 pers./km^2). The density ranges from 4 pers./km^2 in Libya to almost 17,000 pers./km^2 in Monaco. European countries have a population density of about 120 pers./km^2, Balkan countries about 80pers./km^2, Middle-Eastern ones about 177 pers./km^2, and the greater Maghreb about 24 pers./km^2.


Annaba, Algeria


Budva, Monténégro

Excluding the vast uninhabited desert areas of Algeria, Egypt and Libya, the density is estimated to be 100 pers./km² in the 27 countries considered. In North African countries, the national density hides an important divide between the coastal fringe where more than 70% of the population lives (density above 200 pers./km²), and The southern desert part with a density below 3 pers/Km².

It is worth noting that in developed countries featured with high national and per capita GDP and high labor productivity, population density is not a primary factor of pressure on water and wetlands. On the contrary, it is a key factor in developing countries with medium/low national and per capita GDP and lower labor productivity, because of a greater ecological footprint to produce a GDP unit. Ecological overshooting is especially strong when population density is over the carrying capacity of a given development model.

It should be noted that economic migration is an important dimension of the regional economy, with financial transfer (remittance) working indirectly as a regulatory mechanism and buffer against natural resource over-exploitation (logging, construction material, hunting, fishing, and commercial gathering). This is particularly the case in some developing countries such as Bosnia and Herzegovina, Albania, Serbia, FYR of Macedonia, the Palestinian territories, Lebanon, and Jordan, which have an emigration rate exceeding 10% of the population.

III.1.5. CLIMATE CHANGE AND THE RISING SEA LEVEL

The natural environment in the Mediterranean is already significantly marked by pressures from societies. These may be exacerbated by climate change and major impacts are expected on water availability and biodiversity, as well as the human activities that depend on them.

The IPCC's 4th report predicts a spatial and temporal change in rainfall by 2050 and 2100: reduced annual precipitation, fewer rainy days, increased droughts and increased rain intensity. As shown by the use of hydrological models in river basins, climate change will impact the water cycle: the decreasing total rainfall combined with increasing rainfall variability will reduce water resources (both surface runoff and recharge of water tables) and their exploitability. The water-poorest territories may be the most heavily affected: by 2100, precipitation is predicted to diminish by 20 to 30% in Southern countries and by 10% in Northern countries. The other main physical consequence of climate change is the rise in sea level. The global sea level was already rising at an average rate of 1.7 mm per year during the 20th century. A rise of 35 cm is expected by the turn of the 21st century, more marked in the Eastern Mediterranean. A rapid alteration in the water cycle is expected due to increased evaporation and decreased rainfall, with lower water availability, and a change in river flows, (IPCC, 2007).

Mediterranean regions will also be exposed to increased risks of submersion and erosion. The expected phenomena are: increased flooding along the low-lying coastline, especially deltas, lagoons, tidelands, and some islands; acceleration of coastal erosion; increased salinity in the estuaries. As a consequence of both sea-level rise and changes in rainfall and associated water regime, water tables are expected to experience shrinkage, with salt water infiltration and groundwater salinization in the coastal areas.

Flood, Gallician, Camargue, France

As far as wetland biodiversity is concerned, coastal wetlands will be exposed to a risk of submersion with some ecosystems particularly threatened: delta, lagoons, tidelands (IPCC, 2007). Ecosystems will be modified by the increasing in temperatures, changes that will lead to the local extinction of some species. As many Mediterranean species are endemic to a small geographic area, hundreds of them could be lost at the global scale.

The increase in extreme events, and especially droughts and floods, will impact human vulnerabilities and livelihood. Delta areas are particularly concerned: most of them are already undergoing natural subsidence, which results in accelerated rates of relative sea-level rise, above the global average. Many are impacted by the effects of water extraction and diversion, as well as declining sediment input as a consequence of entrapment in dams.

Flood, Arles, France


Old salinas, Camargue, France

III.2. DIRECT PRESSURES ON WETLANDS

Direct pressures are often labelled 'intermediate causes' among developers. The dynamics of main anthropogenic pressures on wetlands is greatly influenced by upstream causes such as political agendas, national socio-economic plans, the development models adopted, governance and national policies. As described below, while agriculture is the main land and water consumer, construction (urbanization, public infrastructure, and tourism development), and industries account for the highest development intensity impacting wetlands. These economic activities, besides the effects of pollution, require more and more energy, including hydropower using dams, which have a significant impact on river fragmentation increasing the stress put on natural wetland ecosystems. These trends especially impact wetlands in populated coastal areas of the Southern and Eastern Mediterranean. Insufficiently controlled and managed hunting and fishing are also important pressures in several countries

Agriculture

Agriculture - including cropping and livestock rearing - is an important economic sector in most Mediterranean countries. As mentioned earlier, the development of agriculture is a political priority in all countries, for national food security, rural employment, income, export revenue, and to provide raw materials to agro-industries.

Agriculture also puts the main pressure on land and water in rural areas, and as a result, it is probably the economic sector most impacting natural and semi-natural wetlands. Historically, fighting against water-borne diseases such as malaria, and extending farmland were the main reasons for draining wetlands. Even today, Egypt, Syria, Morocco, Algeria, and Libya are still continuing to expand their agricultural land into fragile ecosystems, including wetlands, whereas most EU countries seem to have stabilized the surface area under cultivation. However, the pressure on water has increased in countries like Spain and Portugal, where new areas of irrigated agriculture have been developed.

Agriculture is the highest water demanding sector (64% of all water consumed in the region), followed by industry and energy (22%), and domestic consumption (14%). Overall water demand has doubled since 1960. Irrigated surfaces doubled in just forty years, and covered over 20% of all cultivated land in 2005. This trend was very strong between 1981 and 2001 in Syria, Algeria, Jordan, and Libya (109% to 124% increase). Conversely, it is now stabilizing in European countries (due to limits inherent to intensive agriculture), Israel, and Egypt (for political and technological reasons). The overexploitation of groundwater (both renewable and fossil aquifers) for agricultural development is usually underestimated, but is of real concern in countries such as Libya, Algeria, Egypt, Syria, Jordan, Morocco, and the Palestinian territories (Box 4). In North African and Middle-East countries, the development of ground-water pumping for agriculture accelerated in the 1970s due to three main strategic orientations: extension of urban settlements into dry areas, oil prospection (use of abandoned deep-wells where water was found, for irrigation and domestic water supply) and the development of national commercial crop programmes, especially date palm groves, cereals, and vegetables.


Salinas, San Pedro del Pinastar, Spain


Irrigation by pumping, Sidi Khaled, Algeria

Urbanization


Marseille, France

The coastline and large river valleys have always been attractive areas for human settlements. Early Mediterranean civilizations and cities already settled preferably in these areas. Being largely located along the coast or in river valleys, wetlands have naturally suffered from these trends. Today, about 65% of the Mediterranean population lives in urban areas. This ratio is still increasing, due to the demographic growth and to rural-to-urban and international migrations, especially concerning southern and eastern Mediterranean countries. The region hosts over 30 cities of more than one million inhabitants. Urban development and housing is currently developing fast in countries such as Algeria, Egypt, and Tunisia, impacting wetlands in coastal areas, along river beds (marshes and swamps), and in desert areas where settlement takes place (chotts and oases).

Urbanization impacts wetlands in various ways: net land consumption (loss of surface), water abstraction for urban needs, which deprives wetlands of water, degradation by pollution, use as dumping grounds for waste, and disturbances. However, urbanization also provides opportunities for urban wetland development, creation and management for recreational, production and water regulation purposes. The Ramsar Convention has recently decided to strengthen its focus on urban wetlands.

Industry

In the north-western part of the Mediterranean, industry has been gradually replacing agriculture as the primary economic sector since the 19th century. Today, all this part of the basin is largely industrialized, and the trend has extended to North Africa, the Balkans and the Middle East, where industrialization is proceeding at various rates - depending on countries. In these countries, the current important share of industrial GDP in their global GDP should be maintained or increased in the near future until the service economy provides a better comparative advantage. Although in north-western Mediterranean countries industry has already been replaced by services (including tourism) as the main economic sector, its presence in the landscape remains well established (e.g. around the harbour in the big cities like Marseille, Barcelona, and Genova).

Industries impact wetlands in three major ways, wetland conversion, pollution and extraction of materials:


Cadaques, Spain

• Being located on flat land and often close to the sea or large rivers, wetlands offer attractive locations for industrial development. Consequently, wetland drainage is practised on a large scale to build industrial polygons.

• Pollution results from chemicals emitted into both air and water. Airborne pollutants often disperse over large areas before falling onto the land, including wetlands. Solid waste disposal is also a common practice.

• Large-scale extraction of materials (e.g., sand and gravel) from riparian wetlands can impact wetlands directly or indirectly through their effects on rivers and groundwater.

Tourism

Tourism is a very dynamic sector in the Mediterranean region, generating economic growth, income, and employment. The region is the leading destination worldwide for international tourism: in 2007, it received 275 million international tourists (i.e., about 30% of the world total). The Plan Bleu estimates that the number could reach 637 million tourists by 2025, including 312 million in coastal areas alone.

When well managed and environmentally sensitive, tourism may be one of the best development options around wetlands. Sustainable tourism including eco-tourism or well-controlled mass tourism (such as in Dalyan in Turkey or Hula in Israel) can bring significant benefits to local communities, with a limited impact on wetlands.

However, mass tourism has a multi-faceted impact on wetlands: natural and semi-natural land conversion into tourist infrastructure and services, water withdrawal for human consumption, disturbances affecting wildlife and fragile habitats, and pollution.


The Languedoc coastline, France

4. Algerian case study, 2008

Deep wells in fragile Saharan steppe: a short-living new oasis history

In 2008, a 15-year local development plan vision was prepared in the commune of Besbes, Wilaya of Biskra, in the southern part of the Sahara atlas. The area is a dry pastoral Saharan steppe with a long history of nomadic pastoral economy, mostly based on sheep production. In the early 80s, irrigated vegetable production started with the introduction of deep wells, financed by both the government and private livestock owners. In less than 30 years, the commune switched from less than 10 traditional shallow wells to 180 deep and shallow wells, from a 90% nomadic way of life to a 77% rate of permanent settlements, from an economy mostly based on livestock to an economy mostly based on irrigated agriculture, from no permanent crops to 356 ha of date palms and about 50 ha of commercial irrigated vegetable production. TheThe oases created small wetlands by means of canals and basins, allowing the survival of wildlife, the settlement of permanent birds, and the transit of some migratory birds. However, the overexploitation of water, already identified in 2002, has obliged farmers and the government to dig from 7 - 15 meters in 1980, to 40 meters in the 90s and to 90 meters in 2008. Furthermore, without agricultural extension services, new croppers without sufficient technical knowledge continue to exceed irrigation crop requirement by 60%, and some by up to 300%.

The inappropriate management of natural resources (especially water and pasture land) was identified as the key problem to solve in the commune in order to ensure sustainable development. Their overexploitation was increasing poverty in local communities. Among the six environmental problems reported by the communities in 2008, water overexploitation was the top concern in all seven hamlets. Almost all open wells have dried up, and 8 deep wells have been abandoned, together with several thousand date palm trees. Water abstraction from deeper water tables has brought salt and sulphur to the surface, which has accumulated on the topsoil. In these areas, agricultural yields are decreasing, date palms are dying, and wild flora patterns are affected. Young generations cannot even go back to the pastoral economy due to the high rate of steppe degradation by overgrazing, also resulting from the development of deep wells: the limiting factor for sheep carrying capacity has changed from water to fodder.

Energy

Virtually every main way of producing, transporting, and consuming energy has a potential impact on wetlands. For wetlands, energy from hydropower source involves dams impacting the fragmentation of river flows and wetland ecosystems due to the artificial control and release of water. Nuclear and thermal plant cooling modify the water temperature downstream impacting local species. There are also other negative impacts of energy production non-specific to wetlands, such as pollution from fossil fuel burning, and effects of wind turbines and electric lines on birds and bats.

Solar panels, La Palissade, France

On the other hand, unlike in many African and Asian countries, firewood and charcoal are not important domestic sources of energy in the Mediterranean, which therefore does not cause the same levels of deforestation, desertification, and watershed degradation.

Transport

In the Mediterranean, the transport sector is developing fast, in line with national and international trade development. It accounts for c. 30% of energy consumption in the Mediterranean region. Transport impacts wetlands in many ways, such as land conversion to infrastructure (e.g. roads and airports); sea, soil, and air pollution, disturbance of wildlife by traffic, fragmentation of natural habitats, and/or alteration of their hydrology, due to the various networks (roads, rails, canals, and dykes), and the introduction of numerous exotic species, some of which eventually become pests in wetlands, like the Louisiana crayfish in the north-western Mediterranean.

However, in some cases, improved transport facilities can also represent an opportunity for raising awareness about the need to conserve wetlands, sharing conservation experiences, and connecting people with additional means of information.

Hunting

In the Mediterranean, hunting in wetlands was initially a traditional subsistence activity. With increasing economic development, it gradually became a recreational activity instead. Monitoring of biodiversity suggests that uncontrolled hunting and poor habitat protection is probably affecting water birds

Anjar marsh, Lebanon

in the Eastern Mediterranean. Hunting and poaching pressure is still high in many countries such as Albania, Bosnia and Herzegovina, Croatia, Lebanon, Syria, Egypt, and Cyprus partly due to the weak legislation and/or poor law enforcement there.

On the other hand, hunting can also be a powerful tool for wetland conservation. For instance in the Camargue (France) large shooting estates make a living from leasing wildfowling rights. This financial incentive promotes the conservation of marshes by their owners for that purpose - instead of draining them for agriculture, urbanization, or other purposes.

.Fishing and aquaculture

Fishing is an ancestral economic activity in the Mediterranean, performed both for subsistence and commercial purpose. Most available information and statistics focus on marine fisheries (often including coastal lagoons), whilst fisheries in wetlands do not receive much attention, except in a few key sites. One reason is probably that unlike sea fisheries, they usually occur on a subsistence and local trade rather than large commercial/industrial scale. Therefore, despite being a very valuable activity in many Mediterranean wetlands, only fragmentary and local data exist. Aquaculture is a fast developing activity, which is gradually replacing the depleted wild fish stocks in Mediterranean markets.

Like any other exploitation of natural wetland resources, fishing and aquaculture can be either sustainable or non-sustainable. The identified negative impacts are the over-fishing that can cause the local extinction of some species, the introduction of alien fish species, including for aquaculture, can have detrimental impacts on wetlands, inappropriate fishing techniques can be a cause of high mortality for other animals. Intensive aquaculture may also provoke the fragmentation of wetlands and the pollution of water (nutrients and antibiotics).

Finally, fish-eating animals (e.g., pelicans, cormorants, otters and herons) are still sometimes seen as competitors and illegally killed, although this practice is tending to disappear in the Mediterranean. However, recent increases in cormorant populations have revived tensions with fishermen and fish farm managers (e.g., in Israel and Albania).


Souk, Rabat, Morocco

PART IV.
IMPACT OF CHANGES IN WETLANDS

Gediz Delta, Turkey

While wetland conservation networks are mostly concerned by the ecological impacts of changes (mainly biodiversity-, habitat-, and water-related ones), development stakeholders measure socio-economic and sustainable development impacts such as income, employment, social enhancement, and environmental mitigation measures. The evolving ecosystem services[9] impact assessments integrate both considerations (value, integrity, and functions of ecosystem services, and advantages and benefits they procure for people). However, the international development network uses different impact assessment methods compared to conservation stakeholders such as the logical framework analysis, livelihood method, and impact pathway analysis. At this stage, impact of changes on wetlands and associated human well-being are not easy to evaluate, since current national wetland monitoring systems do not measure impact. At the Mediterranean level, the following six types of ecological and human impacts, either positive or negative, have been identified so far.

IV.1. IMPACT OF CHANGES ON WETLAND BIODIVERSITY

Mediterranean freshwater ecosystems have been irreversibly modified

The surface loss, degradation, and fragmentation experienced by Mediterranean wetlands in the past centuries has had irreversible consequences on biodiversity. The lower amount of water available for wetlands and the conversion of natural habitats into agricultural and urban lands took place at such a large scale that large intact freshwater ecosystems have simply disappeared from the Mediterranean. Other major causes include the significant drainage of wetlands for sanitary reasons, re-profiling and embankment of rivers for communication and urbanization, and fragmentation of ecosystems with dams. For most species, it is unlikely that original abundance levels (before the modern industrial era) will ever be reached again. Moreover, dozens of freshwater species unique to this part of the world, restricted to one lake, river system or pond have already gone extinct.

Pristine wetland ecosystems are thus impossible to restore. However, some positive signs are perceptible. The rate of conversion of wetlands and surrounding natural habitats into agricultural and urban land has slowed down in European countries in the last decades while the coverage of protected wetlands has increased. These are positive signs suggesting the possible long-term preservation of the last extensive wetland areas where the ecosystem functioning is still relatively intact (e.g., Donana, Spain). We also observe a decrease in the eutrophication of rivers and some wetlands in the EU.


Gulls in a rice field


Green frog

Loss of the 'Mediterranean' nature of our wetlands biodiversity

The unfavourable conservation status of amphibians and freshwater fishes in the Mediterranean is extremely preoccupying as a large proportion of these species is endemic to the region i.e. not found anywhere else in the world. The status of freshwater invertebrates and aquatic plants - rich in endemic species too - might not be more favourable according to the IUCN Red List. Their decline might be related to the loss of smaller wetland as well as natural habitats peripheral to water bodies. These biotopes were seldom considered by protection measures that primarily focused on the core wetland and larger water bodies attracting a large number of waterbirds. However, these neglected habitats are home to a rare and endemic flora and fauna that contribute to the originality and richness of Mediterranean wetlands biodiversity. Furthermore, amphibians

9 / The concept of 'ecosystem services' is being increasingly adopted by conservation stakeholders in EU countries. In non-EU countries, this concept is still poorly known in the policy and socio-economic arena. The process enabling the progressive adoption and utilisation of the concept is not sufficiently shared outside the scientific conservation networks, with the risk of maintaining the institutional, individual, and territorial divide and understanding over the concept of 'ecosystem services' between conservation and development networks, meaning that common action towards impact may be delayed.

and freshwater fishes, along with other groups unable to disperse over large distances, will have to face the on-going global warming that will provoke the short-term modification of their habitats. They represent one of the main challenges to biological conservation in the Mediterranean.

Another trend concerning the loss of Mediterranean nature of wetlands, measured on birds, is the increase of generalist species that are more resistant to anthropogenic pressures, to the detriment of specialist species. In other words, common and largely distributed species are increasing in number while the proportion of rare and endemic species is decreasing. This result may be correlated to the homogenisation of water management practices around the basin. Natural wetlands are increasingly managed in order to favour human activities like hunting, fishing, and reed cutting. Other wetlands are used to collect drained water from agriculture, industry, and urban areas. Such management does not reproduce the original hydrological functioning of Mediterranean wetlands, which are characterised by more ecological variability. Similarly, the creation of artificial wetlands does not compensate for the loss of natural wetlands as their standardised water management is to the advantage of generalist species. The "globalisation" of Mediterranean freshwater biodiversity is also helped by the introduction of a number of invasive species that out-compete native species. Some non-native introduced species represent a major threat for endemic freshwater fishes in the Mediterranean, and have already caused the extinction of four species.

The recovery of 'emblematic' wetland-dependent biodiversity

New legislation and effective conservation programmes in Europe have allowed many waterbird species to recover from depleted levels. The listing of a large number of species on the protected species list brought an end to persecution campaigns targeting fish-eating birds, such as herons, cormorants, pelicans, and grebes. Likewise, the demand for more rational hunting practices - no hunting during the pre-breeding migration and nesting periods - together with the adoption of specific management measures have enabled large populations of game birds (ducks and coots) to be maintained and even increase in numbers. Wetlands supporting many birds of many species are obviously healthier ecosystems. The improvement of water quality, notably in Europe, also enables us to envisage the natural come back or reintroduction of species that went extinct locally due to pollution and the eutrophication of their biotopes (e.g., migratory fishes and the otter).

However, the increase of some species is independent of any protection measure but the result of their adaptation to new food resources, including rubbish dumps, trawling discards, crop seeds, and newly introduced prey species. In this case, these species have sometimes reached unprecedented high population levels that may provoke a disequilibrium in the ecosystem. For instance, the yellow-legged gull has now become one of the most abundant waterbird species in the Mediterranean whereas it used to be patchily distributed. As it is an opportunistic and willingly predatory birds, in many sites it is now the main cause behind the reproductive failure of other waterbird species (e.g. terns and avocets).

IV.2. I. IMPACT OF CHANGES ON SOCIO-ECONOMIC DEVELOPMENT

Social and human enhancement through environmental awareness and education

During the last two decades, social and human capitals have been enhanced in line with environmental awareness and education programmes. While not quantifiable, all Mediterranean countries recognize that, from politicians to the general public, environmental sensitivity has improved. The efforts in developing environmental awareness, performed by international, national, and local organizations, NGOs and volunteers, especially after the Rio de Janeiro summit in 1992, has had a result. This process entails important changes in attitude, and ongoing changes in practices towards the environment and wetlands in particular. The sharing of information, adoption of new environmental messages, and operational involvement through emerging NGOs and associations, have clearly increased the social enhancement of these people (i.e., social capital, as defined in the Livelihood human development method). The main impacts are: social recognition strengthened through networking, partnership and access to national and international spheres (Ramsar and Medwet specifically for wetlands),

Wetland center, San Pedro del Pinastar, Spain

Education tools, Aammiq, Lebanon

improved environmental education through school programme at wetland sites (i.e., Sidi Boughaba, Prespa, El Kala, and Aammiq), and economic returns through employment and funds raised (NGOs and Associations) to operate environmental awareness and education programmes.

Sustainable tourism: an economic activity that benefits attractive wetlands

In attractive protected wetlands where communities lives (i.e. the Camargue in France, Prespa (Greece, Albania, FYR of Macedonia), Aiguamolls de l'Empordà (Spain), Köycegiz-Dalyan (Turkey), sustainable tourism including eco-tourism is considered to be a beneficial option by the communities and local governments. If well managed, it combines environmental protection, cultural enhancement, and economic returns along the tourism value chain (guides, restaurants, hotels, agencies, car rental, etc.). Through economic returns, people realise the value of wetland services, and become the best defenders of their environmental capital. When sustainable tourism in wetlands becomes beneficial, this service economy is perceived to be an appropriate alternative and compromise between conservation and development, impacting less negatively land, water, and biodiversity compared to agricultural, industrial, and urbanization options.

Lonjsko Park, Croatia


Bird Discovery Centre, Pont de Gau Camargue, France

Social tensions and economic losses as the consequences of unharmonized territorial planning and implementation between protected and non-protected areas

Environmental training, Morocco

The institutional, methodological, and individual divide between protected and non-protected areas in terms of carrying out territorial diagnoses and planning often results in local social tensions and economic losses. The natural and human divide may also exist within a protected area (Box 5). Communes and communities historically manage their territory as a whole, and the segmentation of protected and non-protected territorial planning with diverging objectives is not easy to reconcile at their level. Often, if a site becomes protected without enough consultation and shared agreements, historical human activities such as cropping, livestock husbandry, gathering, fishing, and hunting may continue, illegally. Case studies show that social solidarity, integrity, and relationships may be affected in the process. Some cultural values may also be affected such as seasonal community hunting, fishing, and reed cutting, without compensation and alternatives.

Economic livelihood may also be affected directly and indirectly when:

1) The increase in fish-eating birds (especially cormorants) in protected areas increases the economic threat to local fishermen and fish farmers;

(2) Wild boar, deer, flamingo and crane taking refuge in protected areas during the day damage crops during the night in adjacent non-protected areas, then decreasing food security and income;

(3) The local socio-economic dynamic is weak due to a strict conservation approach, which leads to migration of the labour force (including youth) outside their areas; poaching in the territory by outsiders is then less well-controlled.

5. Albania, Prespa, 2010

Unbalanced conservation-development

In Albania, the National Park of Prespa created in 2001 has the assets needed to attract visitors, mostly through its natural and cultural capital. These assets combine biodiversity including emblematic and endemic species, landscape and aesthetic values including mountains, lakes and other wetlands, cultural and local food traditions, skilled craftsmen, and architectural and archaeological sites.

Several international organizations and NGOs have supported the government in studying the Park's ecosystems, biodiversity, and cultural heritage, and an impressive number of documents has been produced.

Sustainable tourism has been identified as a strategy for promoting this natural and cultural heritage since 2002, However, in September 2010, the tourism sector is still not providing adequate returns or benefits for either the Prespa communities or ecosystems. Most of the local communities continue to rely on economic migration to Greece and FYR of Macedonia, for activities related to agriculture, fisheries, and construction. Private investment in the tourism sector started in 2002, but has declined from 2005 until the present day. The communities of farmers, fishermen, restaurant and hotel owners reported that the creation of the Park did not provide the expected socio-economic, infrastructure and service development, and the area was still not very attractive for tourists. In addition, Prespa was poorly marketed and promoted nationally and internationally. The general opinion among the Liqenas communities is that with the protection of Prespa, a great deal of effort and money was spent by the government and international organizations on the environmental side through a conservation approach, which included research, biodiversity inventories, a legal protection framework, and monitoring. On the other hand, socio-economic needs expressed by the communities through the different planning exercises have not really been budgeted for and implemented.

Liqenas, Prespa, Albania

PART V. RESPONSES

Several conservation activities take place in protected wetlands, as documented in Ramsar national reports and at the site level. At the Mediterranean level, monitoring of responses toward wetlands conservation is still not common, or poorly analized and disseminated. MWO has monitored some responses at the Mediterranean level, three of them through its indicators, the remaining ones by using other sources of information.

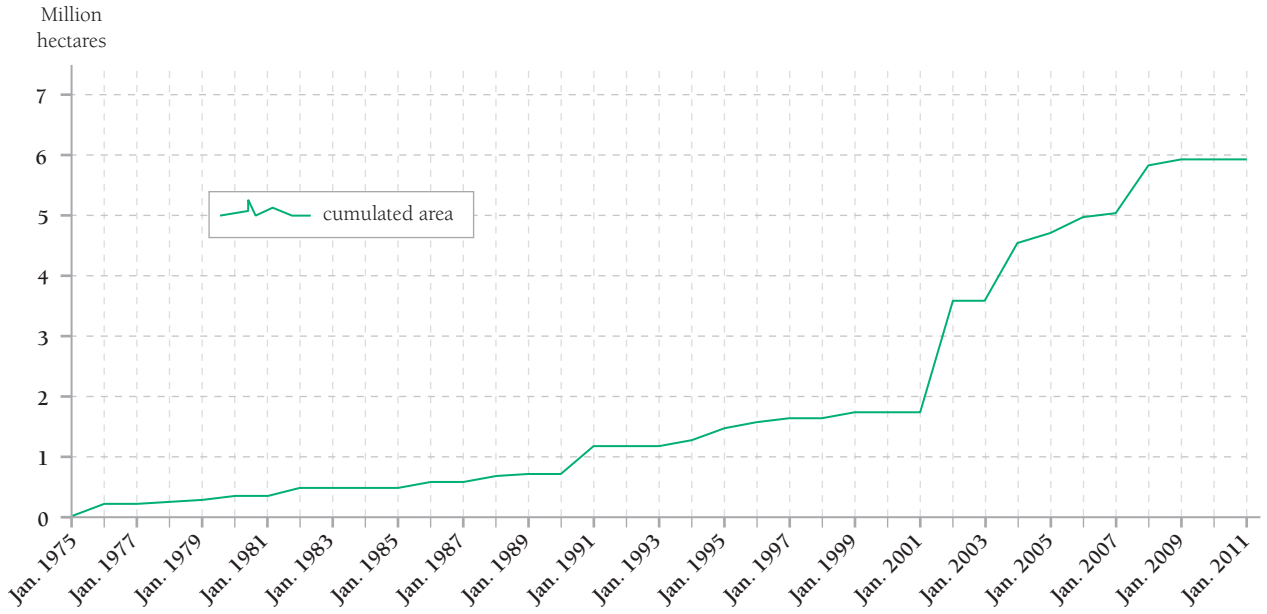


Fig. 11. ***Total surface area of designated Ramsar sites in Mediterranean countries (in millions of ha)***

Increase in surface area of protected wetlands

Since its signature in 1971, the Ramsar Convention has prompted the designation of 344 Ramsar sites in the 27 Mediterranean countries, now totalling 6 million ha (Fig 11). This can be compared to the c. 15-22 million ha. of extant wetlands in the basin.

In the Mediterranean, the surface area designated first grew modestly but regularly until 2000, with the support of the MedWet Initiative. Then Algeria designated numerous very large Ramsar sites in two waves, encouraged by WWF International, and was soon followed by Morocco and Tunisia. In the meantime, most other countries have continued their designations as well. This emulation raised the total number of designated sites to the current high level

A real will to designate Mediterranean wetlands as "protected" is obvious in the region: both the surface of Ramsar sites and of wetlands protected by national laws are increasing in most countries. This trend, which has been sustained since 1975, is encouraging, and the increase in surface area of protected wetlands has probably played a role in the positive trend of the Waterbirds LPI during the same period. It has also possibly limited attempts to expand urbanization and agriculture into large Ramsar sites - although not everywhere (e.g., the Sultan marshes in Turkey). However, an assessment would be needed to measure to what extend Ramsar designation has played a role in improved conservation.

National wetland policy and committee

The government response to protect wetlands through an appropriate policy and legal framework, and the national capacity to enforce environmental laws are key determinants for operational wetlands protection. Ramsar recommends the establishment of a national wetland policy and a national Ramsar or cross-sector committee in order to influence cross-sector decision-making and planning for wetlands, as well as to make policy implementation more efficient.

Eight countries (30%-France, Italy, Slovenia, Israel, Spain, Turkey, Monaco, and Egypt) have established both a wetland policy framework and a wetland committee. Eight countries (30%-Greece, Tunisia, Morocco, Algeria[10], Albania,

10 / In 2011, Algeria has established a cross-sector wetland committee formalized at the end of the year.

Qarum Lake, Egypt

Croatia, Jordan, and the Palestinian Authority) have established a wetland policy framework without a wetland cross-sector committee, potentially limiting the policy influence and its implementation efficiency across sectors. Three countries (11%-FYR of Macedonia, Syria, and Portugal) have established a cross-sector wetland committee with no wetland policy framework. Six countries (22%-Bulgaria, Cyprus, Malta, Lebanon, Bosnia and Herzegovina, and Montenegro) have not, or not yet developed a wetlands policy and strategy framework or an operational cross-sector wetland committee.

Efforts to develop a wetland policy framework are noticeable in most MedWet countries, but the institutional mechanisms (wetland committee) to influence policy implementation across sectors have been established in less than 50% of the countries. In fact, none of these committees are officially formalized by higher authorities, and most of them meet only for the preparation of Ramsar national reports before each conference of Parties (COP).

It is difficult to assess the impact of policy and institutional instruments on the wetlands, their biodiversity, and human well-being. The current bottleneck in terms of a positive impact seems to be the poor degree of implementation of these instruments in the field. At the Mediterranean level, less than 15% of protected wetlands have an operational management plan. Outside protected wetlands, there is almost no influence of policy and institutional instruments to implement it.

Wetlands and Millennium Development Goals (MDGs)

The link between socio-economic development, poverty, and natural assets has been recognized by the Convention of Biological Diversity and the Ramsar Convention, and evidenced in several studies. Since 1990, the MDGs have provided a harmonized and institutionalized monitoring system covering almost all countries, with monitoring focus on developing countries representing 44% of MedWet countries. This international agreement to which all the 27 Medwet entities are committed is using a monitoring framework at the interface between conservation and development.

Under the MDGs, there are 8 goals with associated targets, whose degree of achievement is measured through a set of indicators. Under goal 7 "Ensuring environmental sustainability", the following indicators having a potential link with wetlands and for which enough data was collected have been considered: Indicator 7.1. "*Proportion of land area covered by forest*"; Indicator; 7.8 "*Proportion of population using an improved drinking water source*"; 7.9 "*Proportion of population using an improved sanitation facility*", 7.10. "*Proportion of urban population living in slums*".

Rate of achievement	MDG Objective 7
	Albania
	Algeria
	Bosnia H.
	Bulgaria
	Croatia
	Egypt
	F.Y.R. Macedonia
	Jordan
	Lebanon
	Libya
	Montenegro
	Morocco
	Palestinian A.
	Serbia
	Syria
	Tunisia
	Turkey

Table 2. : ***Rate of achievement of water and wetland related MDG environmental targets***

How to interpret this indicator: *5 countries in green have achieved or are likely to achieve by 2015 the 4 selected (wetland-related) environmental targets. Seven countries in orange could potentially achieve the targets, if they enhanced their efforts. Four countries in red are very probably not going to achieve the targets. Data for Turkey are not sufficient for an evaluation.*

As shown in Table 2, the majority of the countries (75%) have achieved significant results towards these targets, even though seven of them (44%) need to strengthen their efforts. In the four countries that may not achieve their targets by 2015, there is a high correlation with the level of poverty, since they all have a poverty rate over 10%.

During the 1990-2011 period, the indicators for Goal 7 "Ensuring environmental sustainability" showed the following trends that may potentially impact wetlands:

On the negative side

• Increased efforts in drinking water supply in countries that have a deficit of access to water has further created water abstraction (through pumping and water transfer). The outcome of the efforts to reduce slums and to provide proper lodging is the conversion and destruction of natural or semi-natural habitats, especially along the coasts of Algeria, Egypt, Libya, and Morocco.

On the positive side

• On the positive side, the important efforts in providing proper sanitation facilities to households and communities reduce soil and water pollution. Increased efforts in terms of water supply have also been made by means of a sea water desalination system that has decreased pressure on freshwater sources and ecosystems in Algeria, Libya, Israel, Spain, Cyprus, and Malta. Stabilising or even increasing the forest cover in some countries is likely to have positive impacts on watershed protection and water retention.

Other responses identified

• **Supra-national agreements, conventions, and protocols** are influential mechanisms for environmental protection, harmonisation and coordination in the Mediterranean. EU, CBD, Ramsar Convention, Barcelona Convention and associated protocols, the World Heritage Convention, MDGs and Man and Biosphere programme are mutually reinforcing their effects, locally and nationally.

• **EU framework and operational tools** (i.e., Habitat, Birds and Water Directives, Natura 2000 network) are the most efficient driving forces benefiting wetlands in the Northern Mediterranean. They speed up the designation of protected areas including wetlands and push states towards more sustainable water management.

• **Political responses towards wetlands are taking place slowly, usually motivated by the international environmental context**.

• There is a **progressive harmonisation of** coordination between regional, national, and international levels, **limiting duplication and inconsistency** in activities. However, environmental (and wetland) institutions are usually not key players.

• The environmental **awareness and education** efforts have been sustained and diversified, encouraging a wide range

of people, from politicians to civil society, to progressively **adopt a more environmentally-friendly behaviour.**

• There is a slow **improvement in monitoring wetlands** that should be further developed and institutionalized beyond biodiversity and water.

• The evolving development **of the Local Development Planning** systems in southern and eastern Mediterranean countries tends to better **mainstream social, economic, and environmental considerations into territorial development.**

• **Participation of the civil society in wetland issues: ministries and civil society work trustfully together only in sufficiently decentralized governance situations**, while in other countries, NGOs are left out of the national programmes and strategic discussions, and are mostly active through internationally-funded projects.

• The work on ecosystem services has been progressively developed as a method to help politicians and other stakeholders take sound and sustainable development decisions.

The MWO analysis shows that some of these responses may be reinforced, as indicated below in the perspectives for action.

Ramsar Conference of parties, Korea

PART VI.
PERSPECTIVES FOR ACTION BY DECISION MAKERS

Gediz Delta, Turkey

Saving wetlands and sustaining the benefits generated by wetlands for people and future generations would require the commitment of all: policy-makers, civil society, the private sector, international conservation and development organizations and networks, including MedWet, and funding agencies. Several possible operational actions are possible. We indicate here the identified perspectives that are relevant for decision makers. Actions at their level are key for a conducive policy, strategy, and institutional environment that is favourable to wetlands, and also to facilitate the work of operational stakeholders sharing the same goals.

VI.1. ACTIONS AT POLICY AND STRATEGY LEVELS

Better harmonise national and international conservation objectives and targets by sharing more widely linkages with supra-national conventions and agreements

Supra-national agreements and conventions greatly influence national policies and legal frameworks, conservation initiatives and improved national institutional arrangements. However, gaps between international commitments at policy level and at the operational level are still common. This is partly explained by the loss of information in the top-down and bottom-up communication and feedback systems between international, national, and local levels. To reduce this loss and to bring greater value from the international experience into their countries, decision-makers involved in wetlands should be more proactive in sharing information from supra-national agreements and instruments towards lower levels (local administration, site managers, etc.). In the 17 northern Mediterranean countries, information related to EU policy and legal frameworks is of most value for wetlands. In the developing countries, the Barcelona Convention and associated protocols, MDGs, CBD, World Heritage/MAB and Ramsar frameworks may procure mutually reinforcing effects useful for further wetland protection. In Israel, the OECD environmental and biodiversity directives may also help local governments and operational stakeholders to better harmonise their work with international targets.

MedWet meeting, Corsica, France

The implementation of the Specially Protected Areas/Biodiversity (SPA/BD) protocol of the Barcelona Convention should enable stakeholders to better cope with terrestrial coastal ecosystems, especially coastal wetlands connected to the sea (lagoons). In a near future, the SPA/BD protocol should probably be revised and updated so as to reflect the new developments of CBD after the Nagoya Conference of Parties and the coming Rio+20 conference.

The MedWet Initiative, which has been recognized as a model of regional collaboration under the Ramsar Convention, is a unique forum where governments, supra-national organizations and NGOs can agree and act together for effective wetland conservation and wise use. MedWet should engage more pro-actively with key national stakeholders and NGOs, outside the wetland community (e.g., water sector and territorial planning).

Use efficient regional coordination and harmonisation mechanisms

Efficient coordination, either at policy, institutional, territorial or operational levels, improves broader consensus and decision-making, and integration and sequence of actions, while limiting cases of duplication and conflicting options. It also saves time, money, and human energy. The MWO has identified several efficient coordination and harmonisation mechanisms that may help wetland stakeholders for this purpose, as presented below.

In non-EU Mediterranean countries, there are several national and regional coordination mechanisms per sector and between sectors. In Balkan countries, the most efficient coordination and harmonisation mechanism for driving ecosystem and biodiversity protection, is the EU pre-accession Ecological Network instrument to prepare for Natura 2000 sites. A second efficient platform for coordination in developing countries is the national environmental working group and the donor group on the environment (created in line with the Paris declaration), when these groups are operational. Members of these groups are also usually involved in inter-sectoral committees, round-table meetings, and the elaboration of country strategies with donors such as the EU (European Neighbourhood Policy), UNDP, and World Bank.

In EU and OECD countries, coordination between sectoral ministries, local authorities and the civil society is improving. While decision-making processes may be lengthy, the participatory method ensures at least a partly concerted decision among key stakeholders. For wetlands, the Natura 2000 process, but also the national and regional parks coordination

mechanisms (Israel), and the national wetland groups involved in wetland strategy cycles have been identified as the most efficient mechanisms for wetlands.

Develop and implement inter-sectoral national wetland policies and action plans

While political responses are already taking place, further efforts are needed to ensure more effective protection of wetlands.

The national wetlands policy or related policies can be efficient instruments for making changes towards wetlands under the four following conditions:

1. The policy is translated into practical guidelines and assessments incorporated into the strategic documents of other sectors impacting wetlands;

2. An operational wetland inter-sectoral committee is established and recognized at a high level, with the participation of all key representatives having authority or an impact on the environmental planning process including wetlands;

3. Wetland management plans are established and implemented, and integrated as much as possible into national and local development planning in and outside protected areas;

4. A specific budget line in the development planning document, as well as human and financial resources are available for implementing wetland strategies.

Involve more wetland-related decision makers and scientists in sustainable development initiatives

The Barcelona convention is the main regional agreement fostering the sustainable development concept through its Mediterranean Action Plan (MAP), protocols, the Mediterranean Commission on Sustainable Development (MCSD), the Plan Bleu and regional activity centres (RAC). This concept is also supported by MDGs, EU, CBD and Ramsar/MedWet, and at national level in the Mediterranean countries. However, the current direct impact of the various sustainable development initiatives on Mediterranean wetlands is poor due to institutional divide and insufficient commitment of wetland stakeholders. Besides, wetlands being addressed within one unit of one department of one Ministry, these ecosystems have little influence in overall sustainable development issues. Furthermore, the 'ecosystem' approach used for protected areas where most known wetlands are monitored have no equivalent in sector ministries dealing with non protected areas, which represent 70 to 95% of the national territories. It was also found that the Ramsar Convention, due to the fact that it is a pre-Rio convention when several countries did not have a Ministry of Environment, is still represented by the ministries of Agriculture and Irrigation in some developing countries (i.e., Algeria, Morocco, Tunisia, and Syria), and are then relatively isolated from other conventions such as the CBD, EU/Natura 2000, and Climate, which usually fall under the Ministry of the Environment (MWO, 2011). On top of it, the interpretation of the concept, methodology, and objectives of 'sustainable development' between conservation and development institutions and individuals often diverge, keeping the divide and 'territorial monopolies' between protected and unprotected areas.

For more efficient impact of sustainable development initiatives on wetlands, national decision-makers involved in sustainable development and inter-sector committees should encourage the participation and involvement of conservation people in national and local decision-making and planning process, and benefit from their expertise. On the other hand, a more pro-active attitude is needed from wetland stakeholders in: 1) sharing information with Barcelona Convention and PAM representatives and national focal points; 2) being involved or provide input within the national planning process through wetland committee; 3) being more inclined to join development teams at the planning stage of sustainable development projects outside protected areas; 4) participate in the elaboration of the local development plans with other sector planners.

Zoning of El Kala park , Algeria

Boost the participation of the civil society

Following the institutionalization of wetland conservation through the Ramsar Convention, the civil society has continued to play a very important role. In the EU, the increasing demand by the society at large for a better environment has prompted the European Commission to adopt successive "Directives"[11] that directly or indirectly protect wetlands. With funds set up by the EU for implementing these policies, hundreds of organizations from the civil society have run since the 1980s local conservation projects for saving, managing, and restoring wetlands, throughout the Mediterranean.

Outside the framework of the EU and its directives, the role of civil society is less easy, and quite variable between countries. In EU candidate countries with a strong NGO network such as Turkey, Croatia, and Montenegro, NGOs have a role similar to their counterparts in the EU a few decades ago, and are doing their best to convince their decision makers to take their signed commitments seriously.

Outside Europe, the civil society is generally weaker, with differences according to the countries. It is now really emerging, with some very active NGOs in countries like Jordan, Israel,

11 / i.e., trans-national laws, applicable in all EU states


Bou Hedma National Park, Tunisia

Tunisia, Lebanon, and Morocco. On the other hand, few active NGOs exist in others (e.g., Algeria, Libya, Syria, and Egypt) where the engagement of the civil society towards wetlands mainly relies on scientists and universities. They are still not really involved in the national conservation programmes and strategies. In centralised countries, NGOs are still considered by civil servants as an obstacle to government development and conservation programmes.

The first regional wetland initiative-MedWet - started as a project supported by the EU launched in the early 1990s. In 1991, key NGOs (Wetlands International, Tour du Valat, WWF…) and scientists joined forces with national authorities from most Mediterranean countries and supra-national institutions (EU, Ramsar Convention). Together they launched a series of projects, including a basin-wise approach to wetlands conservation. At the end of this project, based on the positive results and demands from Mediterranean countries, MedWet shifted from an EU-funded project to a long term initiative gathering key stakeholders, including civil society representatives.

In France, an NGO called "Ramsar France" has recently been launched with the aim of promoting the "Ramsar brand" and fostering the exchange of knowledge and experiences at national and international level.


Oudjana, Algeria

Lessons learned in Europe and the positive role that the civil society is efficiently playing in the implementation of environmental programmes may encourage other Mediterranean countries to better associate the civil society in the decision-making and implementation process. In these countries, most civil societies, including NGOs, associations, community-based organizations and other environmental groups express their interest to be more recognized and involved in national environment initiatives. This trend is now observed in some Balkan countries, as well as in Israel, Tunisia, and Morocco. This development should be further encouraged in other countries.

Mainstream environmental considerations with socio-economic development into non protected areas

Many wetlands occur in the 80-90% of Mediterranean land that is unprotected. Since the last two decades, a new planning tool intends to integrate environmental issues from the planning stage onwards. Known as local development planning (LDP), it is coming up in use in non-EU Mediterranean countries. This is a decentralized and ascendant planning process with a 5 - to 15 - year vision. Economic, social, and environmental assets are analyzed to set up priorities toward sustainable development objectives. The link between biodiversity and local planning was officially made in the 2011-20 CBD biodiversity objectives (Objective 1, target 2). Almost all North African, Middle-Eastern, and Balkan countries are testing and developing this concept, supported by international agencies such as the European Commission, World Bank, AFD, USAID, UNDP and German, Japanese and Canadian governments. Morocco, Albania, and the FYR of Macedonia have formalized this local planning process, and are already preparing several 'communal plans' (Box 6). Tunisia and Algeria are still at the testing and project stage under the coordination of a sector ministry. In Lebanon, several initiatives of local development plans have started, mostly guided by international funding projects. Croatia and Turkey have their own way of preparing local development plans, using the Local Action Group (LAG) instrument introduced by the EU.


Wetland and urbanization, Marjal de Gandia, Valencia, Spain

Public institutions in charge of elaborating development plans should include ecological expertise in the process, or provide ecological/conservation training for their field team in charge of elaborating the planning. On the other hand, wetland stakeholders should be more pro-active[12] in joining economists, agronomists, and social scientists involved in local development planning, especially in non-protected areas, and to share their professional expertise and knowledge for more balanced and environmentally-friendly development options.

O Encourage, in wetland monitoring systems, a more holistic approach to data collection and interpretation targeting decision makers

Whilst wetlands monitoring is slowly improving, additional urgent efforts are needed to help decision makers to plan and select sustainable development options.

Most data are collected in the important wetlands, usually National Parks and Ramsar sites, especially in non-EU countries. Most monitoring schemes are conceived for sharing information, and sometimes conducted as a mechanical exercise, not for wetland management. This limits their use and efficiency for decision-making. Data collection often focuses on birds and water, and to some extent on soil, fish, and flora. There is a deficit in monitoring data on habitat and ecosystem dynamics. When data are collected, they are usually not analyzed in a broader context aiming at targeted actions. While monitoring institutions recognize that human- related development is the main factor of change in wetlands, they recognise the lack of monitoring of socio-economic data integrated into the wetland monitoring framework.

To enhance the monitoring efficiency towards improved wetland planning and decision-making, current data collected should be much more analyzed and its value promoted through better adapted and targeted communication, feedback, and dissemination. At the national level, there is a need to adapt an impact-based monitoring and wetland assessment monitoring framework with a limited and relevant number of indicators (including wetlands). Data needed to calculate indicators go beyond birds and water, and include ecosystem dimensions as well as socio-economic data. This broader monitoring intends to allow broad and robust diagnosis and interpretation, including cause-consequence relationships, on which decisions can be facilitated. Most urgent monitoring efforts are especially needed in coastal zones, river valleys, and in inhabited arid areas where wetlands are most threatened.

O Sustained awareness and education

Environmental awareness activities and education of both citizens and decision-makers have been one of the main successes achieved in the Mediterranean region during the last two decades. This result has progressively boosted change of attitude and behavior towards nature and environmental concerns.

6. Development Plans, an appropriate tool for improving wetland protection and management

Albania, 2010

In 2010, the MWO Coordination Unit conducted a study in Albania to assess the relevance of current socio-economic development mechanisms useful for environmental integration and mainstreaming into sustainable development. The Prespa Lakes and Vlora Bay wetlands were taken as field case studies. Out of the four mechanisms studied, the Local Development Plan (LDP) was identified as a useful tool for more effective wetland protection and management. This ascendant and participatory planning process at the communal level requires a sufficient level of decentralised governance, democracy, and human resources, which is the case in Albania. The LDP has also been formalized as an official planning document on which annual state budgets can be applied for implementation. Its medium-term vision (10 to 15 years) encompasses economic, social, and environmental considerations. Thus, it potentially allows for balanced and sustainable development processes endorsed by local, sector, and central stakeholders, beyond the electoral cycle. It also enables the current multiple sectoral planning to be integrated within a single plan and for the entire communal territory including protected areas. Environmental issues are no longer cross-sectoral concerns, but rather a full-fledged component with its own targets.

However, the lessons learned from Albania indicate that to further promote the potential of Local Development Planning for enhanced wetland protection, the following efforts are needed: adequate capacity building of local planners in terms of their environmental knowledge, as well as for ecosystems management and biodiversity; incorporation of conservation specialists in the LDP planning team; the involvement, at an early stage in the planning process, of the main stakeholders (institutions and individuals) involved in the territory, including those in protected and non protected areas; vertical linkages and a correspondence between people needs, regional and national agendas, and international commitments (e.g., Ramsar); and finally, the financial and human resources to implement and monitor the activities.

12 / *The institutional and territorial segmentation between protected and non-protected areas is a key difficulty in scaling-up wetlands protection, starting at the planning stage. This lack of participation by conservation agents is considered to be a missed opportunity to influence environmental and wetlands considerations at the territorial planning stage in non-protected areas.*

Environmental awareness and education are conducted through regular national, international, and local programmes, and special events such as Wetlands day, Tree day, Migratory Bird day, Environment Day, seminars, and workshops. The Ramsar Secretariat and its CEPA programme (Communication, Education, and Public Awareness), MedWet, WWF Med-po, IUCN, Tour du Valat, and the "Pôles relais Zones humides" in France have contributed specifically on Mediterranean wetlands. Ramsar site managers have been active in promoting wetland values and services during the World Wetlands Day and through their educational programmes. Several site managers and NGOs are also involved in regular school education programmes in wetlands such as in Prespa, Aammiq, Hula, El Kala, Hutovo Blato, Lonjsko Polje, and Sidi Boughaba (Box 7).

It is important to sustain this effort in view of the development and conservation challenge ahead. It is equally important to further develop early education on sustainable development and ecology at school to teach the new generations to behave in an environmentally-friendly way at an early age. A regional (Mediterranean) university on sustainable development and local development[13] may also prepare the next generation of decisionmakers in acquiring knowledge on the different dimensions of the regional development challenges, on which future decisions should be based.

O Encourage more involvement of the development sector and key local operational stakeholders in the recognition of ecosystem services and their assessment

Human society and its economic system ultimately depend on natural ecosystems both as sources of energy, food, and raw materials, and for waste processing and/or dispersion. The fact that standard economic theory neglects this reality has been identified as one of the main causes of current environmental degradation. Reconnecting economic systems with underlying ecological systems has been one of the main aims of environmental economists. For this purpose, they started to develop the concept of ecosystem services in the 1970s.


School, Sidi Fredj, Algeria

Ecosystem services, including provisioning, regulating, cultural and supporting services, are broadly defined as the "benefits people obtain from ecosystems". For instance, local communities use wetlands for fishing and hunting, many rural households collect fodder and reed for thatch roofs, urban families frequently spend a week-end in front of aesthetically valuable wetland landscapes. Wetlands also help to purify contaminated water as they trap and process water-borne pollutants. They mitigate flood and drought risks by regulating the flows in streams. These goods and services are only a small fraction of all ecosystem services.

7. Educational programmes developed through wetland visitor centres

The Sidi Boughaba wetland in Morocco is a good example where various institutions, both international and national have joined forces by contributing to the creation of a National Centre of Environmental Education (CNEE) on the site. The educational programme is divided into activities undertaken by school groups, university students, and the general public, and the quality of its service is used as an example for the establishment of many similar environmental centres in the country. In addition, teachers use its publications as teaching materials.

At the Prespa National Park, the Greek part of the Ramsar transboundary site shared by Greece, FYR of Macedonia, and Albania, more than 50,000 students nationwide have participated in the educational programmes organised since 1992 by the Society for the Protection of Prespa (SPP), a local NGO. The Park is one of the best sites in Greece for environmental education, due to its easily observable biodiversity and educational infrastructure. Apart from schools, all Prespa visitors can benefit from eco-tours organised by the SPP. Emphasis is also placed on raising the awareness of the local population regarding issues related to the need for cooperation among people sharing the lake watershed.

In Israel, the number of visitors to the Hula wetland has increased since the opening of two visitor centres. In 2009, the Natural Reserve (which opened in 1964), received more than 120,000 visitors and the Agamon centre (which opened in 1994) received 320,000. Tourism and environmental education programmes thus provide significant income in this rural region.

13 /There are already several master's degree and training courses proposed by European Universities and institutions on Mediterranean Development topics: Euromed programme, CIHEAM, IUCN.


Environemental center, Sidi Boughaba, Morocco

Despite the increasing importance of this concept in recent years, especially in developed countries, at this stage no indicator has been defined at the international level to monitor ecosystem services. Since 2010, the Ramsar Convention has started to develop an integrated framework for linking the conservation and wise use of wetlands with poverty reduction, linking wetland ecosystem services to livelihood capitals.

In order to help people involved in wetlands to address continuous wetland loss and degradation, and to identify sustainable development options, it is important to involve them more actively in the ecosystem service assessment and initiatives. This is especially important in non-EU countries, within developer networks, and among local government and field conservation and development managers who still have limited knowledge and understanding of this concept and the related assessment methods.


Ghar el Melah, Tunisia


Skadar lake , Monténégro


M'Chouneche Oasis, Algéria

Promote the value of wetlands through sustainable tourism

Among development and conservation options, well-managed tourism, including ecotourism and cultural tourism, can contribute to protecting wetlands, improve their image, and generate employment and income. The tourism sector has no doubt benefited from the increased media attention received by at least some high-profile wetlands such as the Camargue, Guadalquivir, and the Po delta. The response has generally been to take stock of this increased interest from the society, and to offer a wider range of "tourist products", some of them directly related to wetlands.

As mentioned earlier, the sustainable tourism value chain can generate significant employment and income opportunities that can benefit local communities. The sustainable tourism perspective usually enhances local communities' interest in becoming the best defenders of their own territory and biodiversity, promoting at the same time the sustainable management of the wetlands concerned. It has become obvious from several case studies that through eco-tourism, wetland protection is no longer seen as a burden, an obligation or a less preferred development choice by the local communities, but as a means of developing a local independent economy, and preserving the social life and traditions there. These are very important indirect benefits for traditional communities, which otherwise would have abandoned the area to seek employment in


El Rocio, Andalusia, Spain

8. The Natura 2000 instrument

To reach the CBD target, in 1992 the EU established a Natura 2000 network aiming to protect natural habitats and species. Implementation started in 1995, and in less than 15 years, the proportion of terrestrial protected areas in Mediterranean EU countries has gone from less than 10% to about 20%. A similar process was started in 1998 in seven Mediterranean Balkan countries (Albania, Bosnia-Herzegovina, Croatia, Montenegro, FYR of Macedonia, Serbia, and Turkey), all members of the Emerald Network under the Bern Convention. Many wetlands are included in these areas, and financial resources for further implementation are incorporated in both national and EU budgets. Since 2003, in line with future EU accession, these seven countries have also been conducting surveys (Ecological Network instrument) to propose future Natura 2000 sites based on Habitats and Birds directives. Based on the MWO survey in 2010 and 2011, this is a powerful instrument for nature protection: in March 2011, Croatia had about 12-13% of protected inland areas, and about 8-9% if we include its marine areas. With the survey conducted through the Ecological Network, 47% of Croatia has been proposed for protection, including 35% for Natura 2000.

urban centres. A growing interest in developing sustainable/eco-tourism in wetland areas (Prespa, Lonjsko Polje, Hula, etc.) or in a tour package including wetlands (Hutovo Blato, Camargue, Sidi Boughaba, Aammiq, Doñana, etc.) is noticeable. Another positive outcome of the presence of visitors close to remote wetlands is the discouragement of poachers and the prevention of illegal use and trade of wetland products.

Finally, it should be stressed that sustainable tourism including eco-tourism requires professionalism, and that there are examples of ill-conceived, so-called "ecotourism" projects, which are not respectful of the environment, even though wildlife-watching is included as part of their key elements.

VI.2. OPERATIONAL PRIORITIES

Speed up the protection of wetlands and ensure their effective management

One of the first mechanisms to protect wetlands is - like for other habitats - to designate protected areas of sufficient size, which brings the higher level of protection. Many countries have defined targets in terms of % of national territory to be protected - although not for wetlands specifically. For 2020, the Convention on Biological Diversity has also defined global conservation targets of 17% for terrestrial and inland water ecosystems and 10% of coastal and marine areas.

At least 2,275 nationally and/or internationally protected areas are recognized, covering at least 8.7 million hectares in the Mediterranean hotspot (CEPF, 2010). In addition to these, the EU countries host a further 4,055 Natura 2000 sites (Box 8). Since its signature in 1971, the Ramsar Convention has prompted the designation of 344 Ramsar sites in the Mediterranean (MedWet) countries, now totalling c. 6 million ha.

The challenge between designating protected sites and implementing protection measures in these sites remains unresolved in several countries. Beside political willingness, financial and human resources are the main bottleneck in implementing protection actions and in enforcing laws and regulations. As mentioned earlier, designating sites without implementation may also provoke the opposite effect. However, given the increasing intensity of investment in socio-economic development initiatives, services and infrastructures, it is important to speed-up the protection of the natural and semi-natural wetlands before they are further converted or artificialized. The protection status of additional areas encourages - though legal instruments and participatory management processes-a wider public to address environmental issues in sustainable development options. There are several opportunities relevant for wetlands protection such as the Natura 2000 process, Ecological Network instrument/N2000, National and regional parks, World Heritage, MAB and Ramsar labels, and the use of international and national events.

Improve sustainable freshwater management

Monitoring results from MWO have highlighted the key role of freshwater in wetland conservation and management, and the pressure over water along socio-economic development. The main suggestions for decision makers are as follows:

- Develop a national, cross-sector strategy for water management, taking into account water needs for the ecosystems and the hydrological services provided by wetlands (flood and drought regulation, water depuration, etc.);
- Closely involve the civil society in the elaboration of the water strategy;
- Conserve and restore (Box 9) well functioning wetlands including floodplains, in order to maintain their major hydrological roles, e.g., for water supply (especially water-table recharge) and for attenuating floods and droughts;
- Continue improving water quality through the implementation of the existing agreements/legislation, whether international (EU, Barcelona Convention) or national (especially in non-EU countries);
- In water-poor countries, water is the most sensitive component of wetlands on which decision makers usually take decisions, often at the last moment or when problems

arise. It is important that Institutions, NGOs, and individuals working on wetlands maintain regular contact and working relations with water authorities for early decisions.

O Enlarge and activate the "Pan-Mediterranean wetland community"

The MedWet Initiative has demonstrated its pioneering capacity, gathering key stakeholders from governmental, supra-governmental, and non-governmental organizations for encouraging and supporting the implementation of wetland conservation and wise use throughout the Mediterranean. As such, it has been recognized by the Ramsar Convention and Parties as a model for regional collaboration, and has inspired various initiatives globally. Twenty years after the launch of the MedWet initiative, a key challenge is to adapt its governance scheme and strategy to the evolving regional context, based on an updated and scientifically sound assessment. This requires reinforcing the links between the organizations and ministerial departments dealing with, or impacting wetlands, beyond those involved in their conservation. It also requires finding the most efficient and strategic entry to protect wetlands, that would boost interest and participation of other key development sectors, and develop a communication strategy targeting key decision-makers and planners.

9 . The restoration of a wetland as a way to restore groundwater recharge and water availability (Tunisia)

In eastern Tunisia, close to the Cap Bon, the 3,600 ha freshwater marsh and seasonal Lake of Garaet El Haouaria were drained in the 1950s and 1960s. Farmers were settled on the reclaimed land, and began to grow rain-fed wheat crops in winter and summer using groundwater for irrigation. Since the early 1970s, the water table has dropped by about 9 m, and salt intrusion and soil salinisation have progressively occurred and become widespread. Consequently, the poor agricultural conditions have not encouraged young people to take over this activity, and some have preferred to migrate for economic reasons, abandoning the household well and farm. People asked for the wetland to be restored so as to facilitate groundwater recharge to both the surface and deep aquifers and prevent the "wasteful" drainage of freshwater directly into the sea (Hollis, 1990). The wetland was therefore restored, providing water security.

In Tunisia, the creation of small reservoirs in the hills-artificial wetlands-is currently being used as a solution to retain water during heavy rain and thus to avoid erosion and recharge the groundwater. These aquifers then provide water during the dry season (Mediterra, 2009). Imitating the natural functioning of wetlands is thus being promoted as a solution for improving water recharge and ensuring water security in dry countries.

Traditional cattle keepers, Camargue, France

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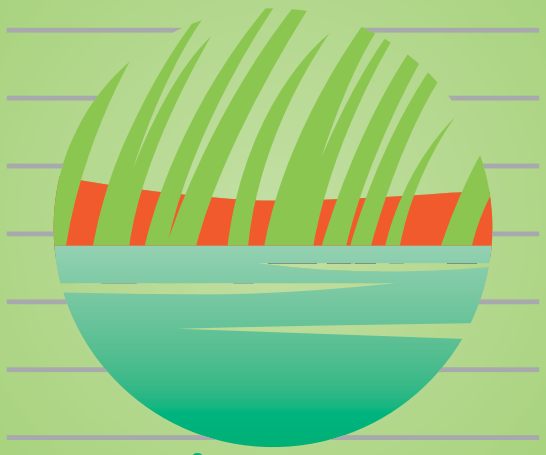

Mediterranean
Wetlands
Observatory

Mediterranean Wetlands Observatory

Tour du Valat - Le Sambuc - 13200 Arles
Téléphone : +33 (0)4 90 97 20 13
Fax : +33 (0)4 90 97 20 19
secretariat@tourduvalat.org
www.medwetlands-obs.org

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