

NATURE-BASED SOLUTIONS

Evidence-based research findings from Tour du Valat

FACT SHEET 3

WISE WATER MANAGEMENT IN MEDITERRANEAN MARSHES

#management #ecosystemfunctioning
#climatesresilience #conservation #biodiversity

📍 Location: Mediterranean Basin
🌿 Habitat: Temporary and semi-permanent marshes



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MANAGEMENT OF MEDITERRANEAN MARSHES

Mediterranean wetlands are dominated by temporary, semi-permanent marshes that naturally dry up during the summer. This pattern, which is due to the high temperatures that increase the evaporation and evapotranspiration (by plants), is not compensated by precipitation and gives Mediterranean wetlands their specificity. Because of changing catchment basins, water resource allocation, and climate, these wetlands are increasingly confronted with the need for proactive and adaptive management to maintain their functions and services.

MAR-O-SEL

Mar-O-Sel is an Open Internet access interface tool designed to promote sustainable water management by multiple users of Mediterranean marshes. This simulator calculates the volumes of water needed to reach a desired water level during the different months of the year, based on past, present, and future climatic conditions. The tool also allows users to visualize the impact of different water management approaches on the evolution of groundwater and surface water salinity as well as the growth of emerging and submerged vegetation in marshes.



THIS PROJECT RESPONDS TO CHALLENGES FACING SOCIETY



» Water security

All the **climate scenarios** for the Mediterranean region foresee a significant decline in both the quantity and quality of **water resources** (salinisation, and higher use of drainage water) at certain times of the year.



» Environmental degradation

The increasing **artificialisation of soils** and containment of **wetlands** make them more and more likely to be **disconnected from the natural water network**. Additional water is often required to **preserve biodiversity and maintain the uses** associated with these environments.



» Human health

This **supply of water** must be **managed wisely and respect natural ecological cycles** so that human activities such as reed cutting, hunting, grazing, and fishing remain sustainable and people have access to high-quality water.



» Mitigating the effects of climate change

The **effects of climate change** make sustainable and coordinated water management imperative.



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ECOSYSTEM-BASED APPROACHES EMPLOYED

» Ecosystem-based management

Ecosystem-based management aims to keep marshes healthy by following natural cycles as much as possible in order to ensure their resilience while enabling shared and sustainable use of resources.

» Ecosystem-based adaptation and mitigation

Enhancing biodiversity makes it possible to capture and store greenhouse gases (in the form of biomass), thereby limiting the effects of climate change.

ADVANTAGES OVER CONVENTIONAL APPROACHES

- ▶ *Water – as a public good – is an increasingly coveted resource for multiple uses.*
- ▶ *Consultation among stakeholders to determine water levels in marshes for productive activities is a complex but essential operation, which enables stakeholders to share*

the same territory and ensure that their activities are compatible.

- ▶ *When marsh stakeholders use a water volume simulator, such as Mar-O-Sel, they can agree on a variety of activities while protecting water and ecosystems.*

HOW CAN MANAGEMENT BE ADAPTED TO CLIMATIC CONDITIONS?

Appropriate hydrological management could help preserve the existing temporary marshes in the context of climate change. This simulation tool estimates the volumes of water that exist and will be needed to maintain biodiversity and the various uses of Mediterranean wetlands.

BENEFITS FOR BIODIVERSITY

- » **Preservation of the Mediterranean wetlands** and in particular the remarkable flora and fauna, while **adapting to natural summer dry-out**.
- » Support the **carrying capacity for nesting birds** (Reed Passerines, (Eurasian) Bittern, Purple Heron, Mallards).
- » Ensuring the supply of water for fresh water or brackish ecosystems.

ECOSYSTEM SERVICES OFFERED BY WISE WATER MANAGEMENT IN MEDITERRANEAN MARSHES

- » **Supporting services**
Water cycle • Habitats for the preservation of biodiversity
- » **Provisioning services**
Food • Water • Fibres • Genetic resources
- » **Regulating services**
Water quality • Water flow
- » **Cultural services**
Spiritual values • Aesthetic values • Recreation • Ecotourism

LESSONS LEARNED

- » *Modelling is a support tool for identifying less expensive management choices. It estimates in a simple way the volumes of water needed to maintain biodiversity and the various uses of Mediterranean wetlands.*
- » *Tools like Mar-O-Sel contribute to the sustainable management of Mediterranean marshes and their heritage.*
- » *This free software helps users think and act from the perspective of climate change.*



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TARGETED SUSTAINABLE DEVELOPMENT GOALS

6 CLEAN WATER AND SANITATION



13 CLIMATE ACTION



15 LIFE ON LAND



INFORMATIONS

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WHAT ARE NATURE-BASED SOLUTIONS?

Nature-based Solutions (NbS) are "actions to **protect, sustainably manage, and restore natural and modified ecosystems** that address **societal challenges** effectively and adaptively, simultaneously providing **human well-being and biodiversity benefits**". They also provide ecosystem services and contribute to achieving sustainable development goals by enhancing biodiversity. NbS are effective, flexible, technologically diverse, and economically viable. They provide an opportunity to increase the resilience of societies to climate change and will facilitate our transition toward a more sustainable and inclusive economy.



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