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Nature-Based Solutions (NbS) in Mediterranean Coastal Zones

LIST OF ACRONYMS

AbC - Area-based Conservation
CAS - Climate Adaptation Services
CBD - Convention on Biological Diversity
CLR - Coastal Landscape and Seascape Restoration
CSIRO - Commonwealth Scientific and Industrial Research Organisation
EbA - Ecosystem-based Adaptation
EbM - Ecosystem-based management
EbMi - Ecosystem-based Mitigation
EBSA - Ecologically or Biologically Significant Areas
Eco-DRR - Ecosystem-based Disaster Risk Reduction
EE - Ecological engineering
EEA - European Environment Agency - European Union
ER - Ecological Restoration
ETC/CCP - European Topic Centre on Climate Change impacts, Vulnerability and Adaptation
FAO - Food and Agriculture Organization
FLAG(s) - Fisheries Local Action Group(s)
FP7 - European Commission 7th Framework Programme for Research and Technical Development
GI - Green infrastructure
ICZM - Integrated Coastal Zone Management
IUCN - International Union for Conservation of Nature
MAES - Mapping and Assessment of Ecosystems and their Services
MBPC - Mediterranean Biodiversity Protection Community
MPA(s) - Marine Protected Area(s)
NOAA - National Oceanic and Atmospheric Administration
MSP - Marine Spatial Planning
NbS - Nature-based Solution(s)
NI - Natural Infrastructure
OECMs - Other Effective Area-Based Conservation Measures
TESSA - Toolkit for Ecosystem Service Site-based Assessment
UK - United Kingdom
UNEP - United Nations Environment Programme
UNEP-WCMC - UN Environment Programme World Conservation Monitoring Centre
WWF - World Wildlife Fund

Nature-based solutions: definition and associated concepts

Mediterranean marine and coastal zones host some of the ecosystems most vulnerable to the impacts of **climate change and human activities such as unsustainable tourism, fishing, and pollution** (Canals Ventín and Lázaro Marín, 2019). A wide range of nature-based actions, commonly referred to as 'Nature-based Solutions' (NbS), play an important role in conserving and restoring such ecosystems, which in turn contribute to climate change adaptation and mitigation, as well as improving the resilience of exposed coastal communities.

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NbS is a relatively new term that has gained momentum in recent years. IUCN defines NbS as "actions to protect, sustainably manage, and restore natural or modified ecosystems that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits" (Cohen-Shacham et al., 2016 ; Figure 1).

About **one third of the Mediterranean population** is concentrated along its coastal regions (EEA, 2015), resulting in more than 250 million people being particularly exposed to the effects of climate change that include sea level and temperature rise, sea acidification and increased frequency of extreme weather events. Although examples of NbS in the Mediterranean coastal and marine environment are limited, there has been increasing interest in their application over the past decade among political and scientific decision-makers. Nature-based solutions can combine **climate change mitigation and adaptation, biodiversity conservation and sustainable resource management**, for the benefit of coastal communities and can be applied at a landscape or seascape level, and can be implemented alone or in an integrated manner with other solutions (IUCN, 2019). As an umbrella concept, NbS cover a range of ecosystem-related approaches. For coastal and marine contexts, NbS can be grouped into five broad categories or types, as shown in Table 1.

NbS focus type and definition	Examples
Ecosystem restoration: Ecosystem restoration is defined as "*a process of reversing the degradation of ecosystems, such as landscapes, lakes and oceans to regain their ecological functionality; in other words, to improve the productivity and capacity of ecosystems to meet the needs of society. This can be done by allowing the natural regeneration of overexploited ecosystems or by planting trees and other plants*" (UNEP, 2019).	**EE** - Ecological Engineering **ER** - Ecological Restoration **CLR** - Coastal Landscape and Seascape Restoration
Ecosystem-based management (**EbM**): "*In ecosystem-based management, the associated human population and economic/social systems are seen as integral parts of the ecosystem. Most importantly, EbM is concerned with the processes of change within living systems and sustaining the services that healthy ecosystems produce. EbM is therefore designed and executed as an adaptive, learning-based process that applies the principles of the scientific method to the processes of management*" (UNEP, 2006).	**ICZM** - Integrated Coastal Zone Management **MSP** - Marine Spatial Planning
Natural Infrastructure (**NI**): Natural infrastructure provides effective solutions for minimising coastal flooding, erosion, and runoff, as do man-made systems that mimic natural processes. Such an approach represents a successful and cost-efficient way to protect coastal communities (Office for Coastal Management, NOAA). The European Commission defines Green Infrastructure (**GI**) as "*a strategically planned network of natural and semi-natural areas with other environmental features designed and managed so as to deliver a wide range of ecosystem services*" (European Commission, 2015).	**NI** - Natural Infrastructure (eg. mangroves, oyster reefs, wetlands, sand dunes) **GI** - Green infrastructure
Issue-specific ecosystem-improvement: This refers to the use of biodiversity and ecosystem services as part of an overall adaptation strategy to help people to adapt to, mitigate or reduce the adverse effects of climate change (CBD, 2009). It encompasses policies and measures that consider the role of ecosystem services in reducing the vulnerability of society to climate change, in a multi-sectoral and multi-scale approach (Andrade Pérez et al., 2010).	**EbA** - Ecosystem-based Adaptation **EbMi** - Ecosystem-based Mitigation **Eco-DRR** - Ecosystem-based Disaster Risk Reduction **CAS** - Climate Adaptation Services
Area-based Conservation (**AbC**): AbC approaches are considered as important elements to address conservation, sustainable use as well as equitable benefit-sharing objectives, bearing in mind that all ecosystems need management strategies to secure biodiversity (UNEP-WCMC, 2019).	**OECMs** - Other Effective Area-Based Conservation Measures **MPAs** - Marine Protected Areas **EBSA** - Ecologically or Biologically Significant Area

Table 1: Types of Nature-based Solutions for the coastal and marine environments (adapted from Cohen-Shacham et al., 2016)

Using NbS to conserve vulnerable coastal and marine ecosystems in the Mediterranean

NbS are typically robust, flexible, cost-efficient, inclusive and long-term oriented solutions (Cohen-Shacham et al., 2016; Plan Bleu, 2019; Chausson et al., 2020). Whether stand-alone or combined with engineered solutions (known as "green-grey infrastructure"), NbS offer co-benefits related to **food security, livelihoods, improved health and well-being, water regulation and disaster risk reduction**, while contributing to **nature conservation and restoration** (Plan Bleu, 2019). The main NbS contributions to addressing societal challenges across Mediterranean coastal zones are briefly outlined in Figure 2.

Human well-being / Economic and social development

Coastal and marine NbS are profitable and welfare-enhancing for humans, as they support livelihoods, health, well-being, food systems, and the creation of jobs among others. NbS aimed at securing coastal setback zones (e.g. wetlands) contribute directly to increasing the safety of people and property along the coastlines from marine flooding during extreme weather events, as well as mitigating sea level rise and erosion. NbS also support the sustainable development of communities that benefit from and depend on coastal and marine ecosystem services for their work (e.g. fishing, aquaculture, tourism), recreation and education.

Disaster risk reduction / Climate change mitigation and adaptation

Restoring and preserving ecosystems such as wetlands, sand dunes and blue carbon sinks (marshes, seagrass) can help Mediterranean communities to better adapt and become more resilient to the adverse effects of climate change. These ecosystems can reduce physical exposure to disasters by serving as protective barriers or buffers, provide carbon sequestration for climate mitigation, and therefore increase the resilience of coastal zones.

Food and water security / Environmental degradation and biodiversity loss

NBS can be of great benefit to local biodiversity and ecosystems by improving water quality, acting as a nursery for marine species, and thus improving fisheries productivity (Lecerf et al., 2021). NbS such as well-managed MPAs can also help preserve healthy coastal and marine ecosystems that provide effective natural buffers against the effects of climate change. Nature-based approaches can be more robust than mainstream engineered solutions in increasing both resiliency and sustainability of food production systems while limiting negative impacts on the environment.

Figure 2: NbS contributions to addressing societal challenges in the Mediterranean coastal zones (badges from Cohen-Shacham et al., 2016)

NbS-type actions can also play a key role in supporting coastal ecosystem conservation strategies. As stated in the key policy recommendation n°5 of the Plan Bleu 2019 policy paper on NbS (Plan Bleu, 2019), four categories of NbS-type actions could contribute to protecting, restoring and adapting Mediterranean coastal ecosystems vulnerable to climate change and overexploitation:

CATEGORY 1: Actions to protect and/or restore "blue carbon" sinks

Habitats that sequester and store blue carbon, like salt marshes and seagrass beds, have been dubbed "carbon sinks" and their health and presence are essential for mitigating other effects of climate change (Climate Action Tool, University of Massachusetts Amherst). These habitats found in the Mediterranean, have been shown to have high rates of carbon sequestration and offer a colossal CO_2 storage capacity (IUCN, 2019; Abdul Malak et al., 2021; Table 2). Posidonia meadows in particular cover only a tiny fraction of the Mediterranean but are estimated to have stored between 11-42% of the total CO_2 emissions from Mediterranean countries since the Industrial Revolution (Pergent et al., 2014).

Blue carbon ecosystems	*Carbon sequestration rate (gC m-2 yr-1)*	*Carbon stock (MgC ha-1)*
Salt marshes	*166*	*200 to 400*
Seagrass meadows	*52*	*380*

Table 2: Average sequestration and carbon sink capacity of blue carbon ecosystems in the Mediterranean (from Abdul Malak et al., 2021)

In addition to carbon sequestration for climate mitigation, restoring, conserving and maintaining the good ecological status of these blue carbon sinks also provides a wide range of ecological and human co-benefits. They provide **natural defences against coastal storms, aid sediment stabilisation** (preventive buffers against erosion exacerbated by sea level rise), **enhance nitrogen fixation and net oxygen production** (essential for marine life), **house a diversity of species and support recreational opportunities** (e.g. underwater tourism), among other ecosystem services. It is also well known that many marine species depend on these coastal habitats as spawning and breeding grounds, with Posidonia meadows providing a vital habitat for some 20% of marine species in the Mediterranean (WWF, 2021). Mediterranean salt marshes are also important feeding and breeding habitats for millions of wetland birds and other unique and diverse flora and fauna.

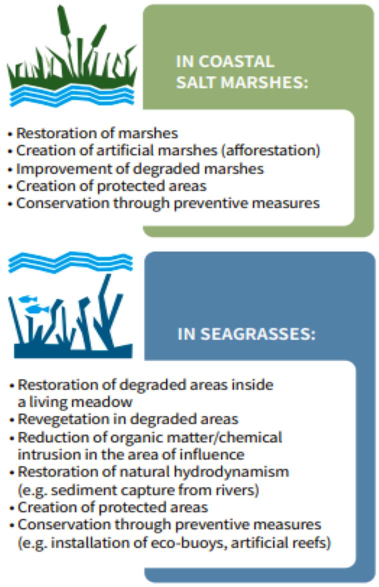


Figure 3: Examples of intervention to preserve, restore or protect blue carbon sinks (from IUCN.a. 2021).

Banquettes of Posidonia are considered nature-based coastal defences that enhance dune formation and stabilisation, support biodiversity and minimise beach erosion. However, they are often perceived as a nuisance and therefore negatively affected by mismanagement practices and removed from beaches for aesthetic and/or beach user access reasons (Mossone et al., 2018).

It is clear that blue carbon sinks play a vital role in the health and sustainability of coastal ecosystems and provide key services for many species as well as co-benefits to coastal communities. It is important therefore, to implement NbS interventions to conserve, restore or protect these habitats in Mediterranean coastal areas. In its Manual for the creation of Blue Carbon projects in Europe and the Mediterranean, the IUCN Centre for Mediterranean Cooperation provides knowledge-based guidance for developing such NbS interventions (IUCN.a., 2021; Figure 3).

CATEGORY 2: Actions to strengthen ecosystems resilience

In its paper "Coastal Development: Resilience, Restoration and Infrastructure Requirements" (Steven et al., 2020), the High Level Panel for a Sustainable Ocean Economy highlights four main management strategies that can be used to strengthen the integrity and resilience of coastal ecosystems and secure their contributions to people:

1. **Protection strategies** - These use regulations and area-based management (such as area-based conservation approaches), to designate where and how much of specified activities can occur in coastal environments and adjacent catchments, to legislate areas for conservation such as marine protected areas (MPAs; see Box 1) or to implement area-, habitat- and species-specific conservation plans (e.g. OECMs).

2. **Mitigation strategies** - These aim to reduce local stressors caused by human action through technology, and the regulation and promotion of stewardship to minimise the introduction of pollutants (e.g. marine litter) and the overexploitation of marine resources or activities that will otherwise harm coastal environments.

3. **Adaptation strategies** - These consider the overall coastal social-ecological system and are implicitly related to resilience. Their underlying principles include: Ecosystem-based Adaptation and Ecological Engineering to incorporate Nature Infrastructure into existing grey infrastructure, relocation of at-risk activities and populations away from the coast and incentives to change behaviours and

practices. Adaptation strategies strengthen the functional relationships within the land-sea ecosystems and between species to increase their resilience.

4. **Repair strategies** - These seek to restore damaged ecosystems by restoring the composition and/or function of lost or fragmented habitats; reinstating the natural hydrology, sediment and nutrient balance entering and cycling through coastal ecosystems, or by assisted evolution.

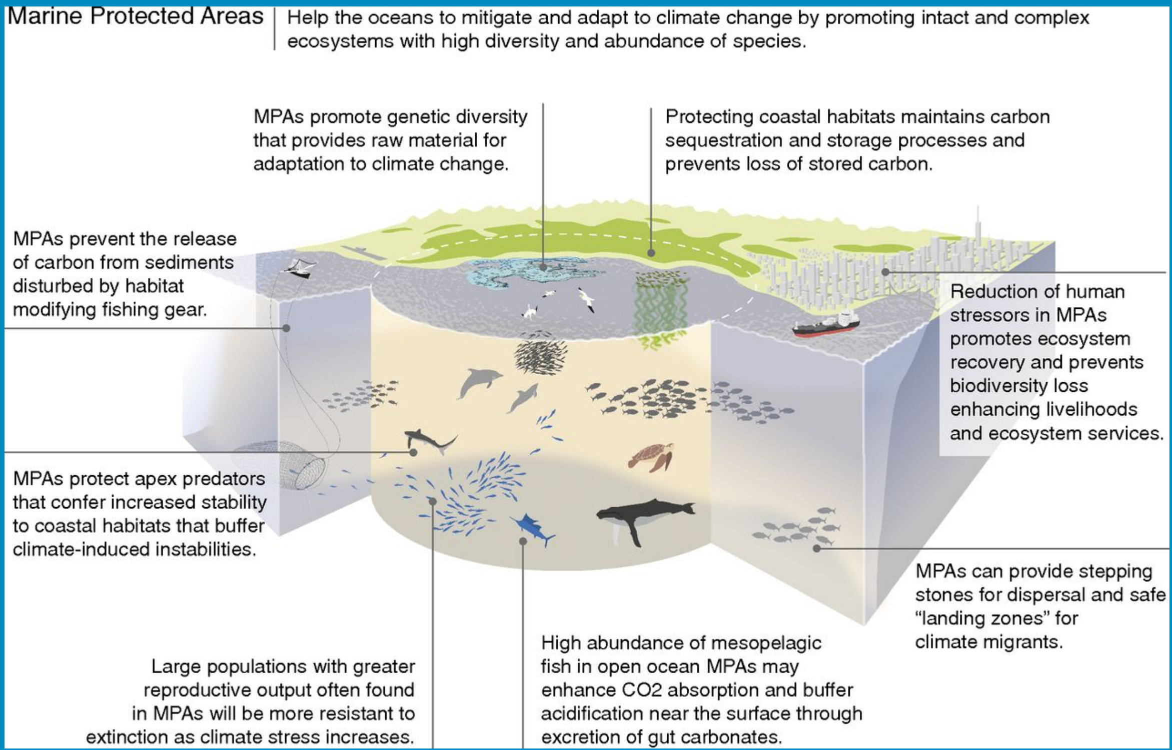
All four strategies fall broadly under the umbrella framework of NbS. Figure 4 summarises this global vision for building coastal resilience and lists some actions in that regard. The success of these strategies relies on a number of enabling factors that encompass the dimensions of technical readiness, social equity, economic viability and environmental sustainability (shown in the outer blue ring of Figure 4 ; Steven et al., 2020).

Figure 4: Four strategies and actions for building coastal resilience and the enabling conditions required to achieve them (from Steven et al., 2020, source: CSIRO).

BOX 1: Mediterranean Marine Protected Areas as nature-based solutions to climate change

MPAs support global efforts to address climate change because of their important role in maintaining healthy marine and coastal ecosystems that provide sustainable ecosystem services and increase the ecological, social and economic resilience of coastal communities (Roberts et al., 2017). When well managed and integrated, MPAs can contribute to building resilience in both coastal communities and marine biodiversity. Promoting the development of NbS through the existence of MPAs and implementing specific ecosystem improvements will reinforce the value of Mediterranean MPAs in mitigating some of the impacts of storm surges, flooding, wave-related damage, erosion, shoreline retreat, and sea level rise, in addition to providing multiple co-benefits for coastal communities (IUCN, 2019 ; Lecerf et al., 2021). Furthermore, MPAs where stressors are monitored, can be used as sentinel research sites to help track the effects of climate change at a local level (IUCN, 2017). The networking and close collaboration of MPAs and their close collaboration are key.

More information is available in this **video.**



(Figure from Roberts et al., 2017)

CATEGORY 3: Actions to implement and/or foster sustainable fishing practices

In its report "Adaptive management of fisheries in response to climate change" (Bahri et al., 2021), the FAO describes the four foundations of climate-resilient fisheries as follows: (1) establishing effective fisheries management systems, (2) setting participatory fisheries' management systems, (3) apply precautionary systems to deal with uncertainty and risks, and (4) adaptive fisheries management systems.

One approach that has been successful in supporting the implementation of sustainable fishing, is the empowerment of relevant stakeholders through co-management and their continuous involvement in decision-making and management processes. Co-management can help strengthen relationships and trust among fisheries' stakeholders, e.g. between fishers and MPA managers, and hence fosters greater collective actions for sustainable fisheries and effective adaptation options to climate change (Jentoft, 2005; Pittman et al., 2019). Participatory approaches are especially successful when used to set up and manage MPAs or local management plans. There are numerous examples that demonstrate the sustainable benefits of involving fisheries representatives in the different stages of the implementation of an MPA and in its decision-making committees. Platforms such as Fisheries Local Action Groups (FLAGs) based on a bottom-up approach can also play a vital role in setting up local fisheries co-management arrangements (Rigaud et al., 2018).

Lastly, it is essential to promote sustainable fishing by introducing incentive measures that financially support and reward fishers in transition towards more environmentally friendly fishing techniques (e.g. use of more selective gear, reduce the fishing industry's carbon footprint). Climate-smart fisheries management frameworks will help futureproof fisheries and allow them to play their role in combating climate change (e.g. the UK Fisheries Act 2020; Stephenson and Johnson, 2021). Further, supporting collaboration between scientists and fishers and sharing knowledge, is undoubtedly the most efficient way of finding innovative solutions to sustainably adapt fishing practices to the effects of climate change in the Mediterranean. Once again, it can be seen that MPAs can play an important role, in this instance as experimental laboratories by catalysing the development of such cooperation programmes between scientists and fishers. The networking of MPAs can also broaden the scope for collaboration, comparison and the replication of good practices.

BOX 2: RISC-KIT project: Resilience-Increasing Strategies for Coasts – toolKIT

The FP7-funded "*Resilience-Increasing Strategies for Coasts*" **RISC-KIT** project (2013-2017) developed a toolkit to reduce risk and increase resilience to low-frequency, high-impact hydro-meteorological events in the coastal zone. More information is available **here**.

CATEGORY 4: Actions to establish and/or conserve coastal setback zones

A coastal setback zone is a buffer area where some or all types of development are prohibited or significantly restricted (Zhu, Linham and Nicholls, 2010). One of the main functions of coastal setback zones is to provide **coastal protection for residents against coastal flooding and erosion**. Coastal setbacks can also have multiple environmental, economic and cultural co-benefits. For example, improved water quality, by filtering chemicals and sediments from the water; preserving biodiversity; maintaining the natural functions of habitats at the land-sea interface, including sedimentary and hydrological connectivity; and supporting the coastal economy, such as the beach economy, tourism and recreation, fishery and aquaculture. Additionally, coastal setbacks are considered low cost and less intrusive than seawalls and dikes and other solid barriers since they allow the natural dynamics and rhythms of the shoreline to exist and are therefore considered an environmentally sustainable measure for this reason (NOAA, 2010). Setbacks are complementary measures, meaning that their benefits are enhanced when implemented in combination with other measures such as sand dune reconstruction or wetland restoration. Combinations of natural infrastructures and structural engineering are often named “hybrid solutions” or “green-grey infrastructures” (Powell et al., 2019).

Coastal wetlands that encompass **salt marshes, salines, intertidal flats, coastal lagoons, and estuaries** can also play a setback zone role. Although wetlands cover only 2-3% of the total area of the Mediterranean region, one fourth of its species depend on these habitats for their survival, making them a true biodiversity hotspot (Mediterranean Wetlands Observatory, 2012 ; Tour du Valat, 2018). Regrettably, almost half of wetland areas in the Mediterranean basin have disappeared since 1970, as a result of both human activity and natural processes exacerbated by climate change (Tour du Valat, 2018). Developing an integrated and transboundary basin management plan is therefore a necessary conservation action to stop the degradation of Mediterranean wetlands (MBPC report, forthcoming). The urgent consideration of wetlands as NbS for their role as setback zones has been emphasised on numerous occasions by the partners of the Mediterranean Wetlands Initiative MedWet, notably through the recent Wetland-based Solutions project (Box 3).

BOX 3: Pooling efforts to sustainably manage Mediterranean wetlands and promote them as NbS

Using wetlands as nature-based solutions to some of the Mediterranean's most pressing issues will benefit society just as much as the environment. This is why the **Wetland-based Solutions project** was created, with the financial support of the MAVA Foundation. It gathers a powerful network of 13 expert organisations working to conserve and restore Mediterranean wetlands, by pooling their expertise and experiences to hone skills, identify successful solutions, raise awareness, and spread best practices across the basin. The pilot **Maristanis project** (Sardinia, Italy, 2017-2020) works in the Gulf of Oristano, which is home to 85,000 people and six Ramsar Sites comprising 7,700 hectares of wetlands. It is thought that significant parts of this area could be flooded by 2100 due to climate change. In response to this threat, 13 local municipalities and two regional authorities signed the Oristano Coastal Marine Contract in February 2021 to implement a multidisciplinary and concerted policy action, based on an ICZM approach. This contract, involving mayors, citizens and business leaders of the region, recognises the multiple goods and services of high economic value provided by coastal wetlands and sets the basis for effective management and sustainable development of the Gulf of Oristano wetlands. Find out more about the project **here.**

Assessing NBS effectiveness: environmental, economic and social benefits

Since the early 2010s, with the increasing use of NbS, many methodologies to assess the effectiveness or impact of this type of intervention have emerged. These methodologies often use a mixture of different approaches such as ecosystem services assessment, cost-benefit assessments, human well-being assessments, risk assessments and trade-offs assessments.

Traditional ecosystem service assessments, such as the Mapping and Assessment of Ecosystems and their Services (MAES) framework developed by the European Commission (2013), mainly focus on the linkages between stocks and flows of ecosystem services and their benefit to humans. The NbS impact assessment framework developed by the EKLIPSE Expert Working Group on Nature-based Solutions to Promote Climate Resilience in Urban Areas (EWG) however, recognises the potential for a range of other social, economic and environmental impacts - also known as "co-benefits" (Raymond et al., 2017 ; Figure 5). The EWG aims to provide guidance to practitioners in moving from the assessment and valuation of ecosystem services to a wider assessment of the co-benefits (and costs) of NbS through the lens of the co-production of ecosystem services. It also underlines the importance of both monetary and non-monetary valuation techniques to assess NbS impacts (Raymond et al., 2017).

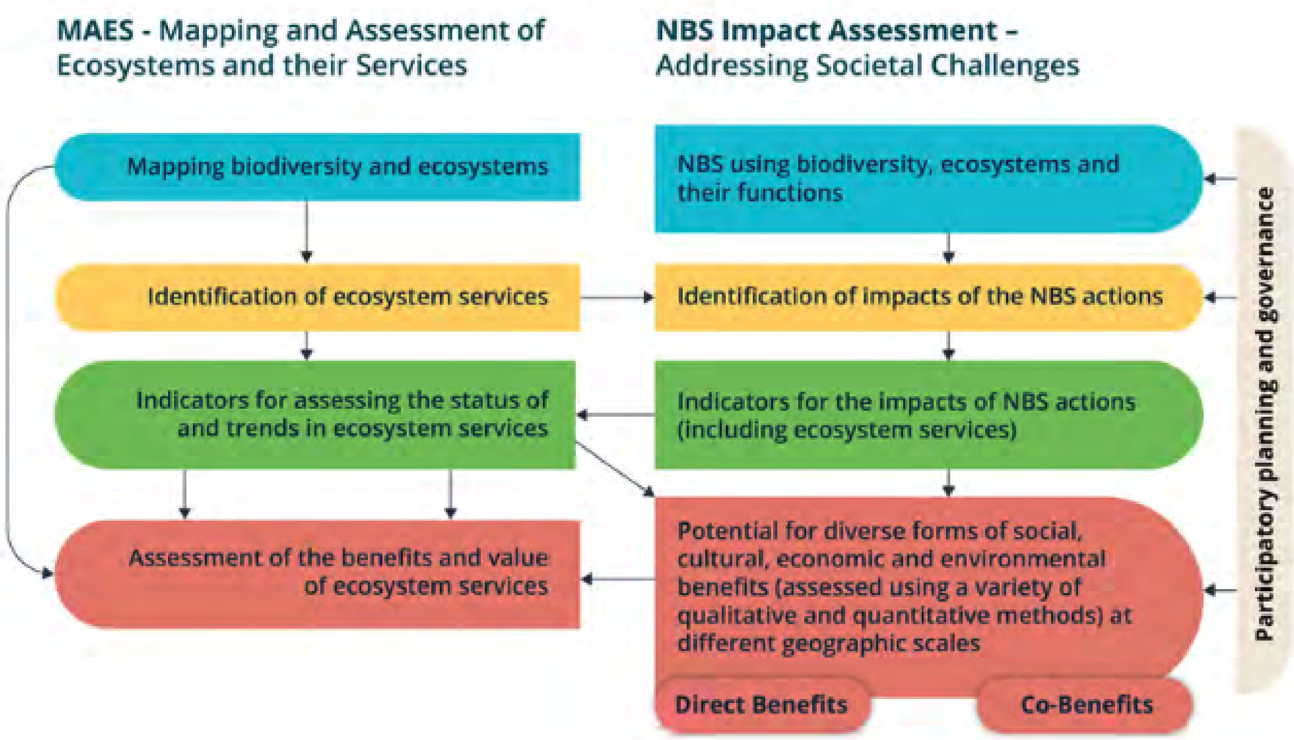


Figure 5: Flow diagram showing the relationships between the NbS impact assessment framework (EU-guideline EKLIPSE) and MAES framework (from Raymond et al., 2017).

The Tour du Valat's project, aiming to restore the Camargue's former saltworks, is an excellent example to illustrate the assessment of NbS effectiveness in a coastal area. The project assessed the environmental, economic and social aspects of their project according to the challenges, actions and associated impacts identified using the EKLIPSE guidelines for NbS Impact Assessment described above (Segura et al., 2018). Table 3 provides an example extract of the evaluation used.

Evaluation type	Challenge	Action	Impact	Indicators (unit of measurement)
Environmental	Coastal erosion and loss of beach ecosystems	No longer maintaining and restoring the dikes along the coastline	Restoration of a sandy coastline behind the abandoned dikes	Beach topography; coastline retreat (metre)
Social	Protection of people and properties in surrounding areas	Establishment of a buffer zone to mitigate disaster risk between the sea and the inner protection dike	The project addresses the issue of protecting people and properties	Insurance values (€)
Economic	Coastal erosion	Defence infrastructures located along the seafront are no longer maintained (9 km)	Savings in public funds: €13 to 17 million investment for the reconstruction of dikes, €7 to 24 million for the construction of groynes, at least €800 000 in annual maintenance	Savings due to the absence of maintenance work on seafront dikes (€)

Table 3: Extract from the evaluation of NbS effectiveness for the restoration of the former Camargue's saltworks project in France (evaluation based on EU EKLIPSE guidelines - the table below is adapted from Segura et al., 2018)

In July 2020, the IUCN released its Global Standard on Nature-based Solutions. This Standard aims to equip practitioners with a robust framework for designing and verifying NbS that yield desired outcomes that solve one or several societal challenge(s) (see Box 4). A self-assessment tool has been also developed to enable users of the Standard to calculate a percentage match of their intervention against the eight Criteria and identify whether their NbS intervention adheres to the IUCN Global Standard (IUCN, 2020).

BOX 4: The IUCN Global Standard for Nature-based Solutions (IUCN, 2020)

The IUCN standard is designed to support users to apply, learn and continuously strengthen and improve the effectiveness, sustainability and adaptability of their NbS interventions. It consists of 8 Criteria (listed below) and 28 Indicators.

Criterion 1 - NbS effectively address societal challenges

Criterion 2 - Design of NbS is informed by scale

Criterion 3 - NbS result in a net gain to biodiversity and ecosystem integrity

Criterion 4 - NbS are economically viable

Criterion 5 - NbS are based on inclusive, transparent and empowering governance processes

Criterion 6 - NbS equitably balance trade-offs between achievement of their primary goal(s) and the continued provision of multiple benefits

Criterion 7 - NbS are managed adaptively, based on evidence

Criterion 8 - NbS are sustainable and mainstreamed within an appropriate jurisdictional context

More recently, the European Topic Centre on Climate Change Impacts, Vulnerability and Adaptation (ETC/CCA) also published a comprehensive report on "Assessment Frameworks of Nature-based Solutions for Climate Change Adaptation and Disaster Risk Reduction"(Veerkamp et al., 2021), that aims to provide a concise overview of available NbS assessment approaches in the context of climate change adaptation and disaster risk reduction. The various assessment methods/approaches identified in the report were mapped according to whether they are primarily data-driven or stakeholder-driven, and according to the assessment elements on which they most often focus, their technical, economic or environmental and social impacts (Figure 6). In its conclusion, the report stresses the importance of NbS evaluations in providing evidence of technical, environmental, social and economic performance, essential for replication in similar contexts and for scaling up.

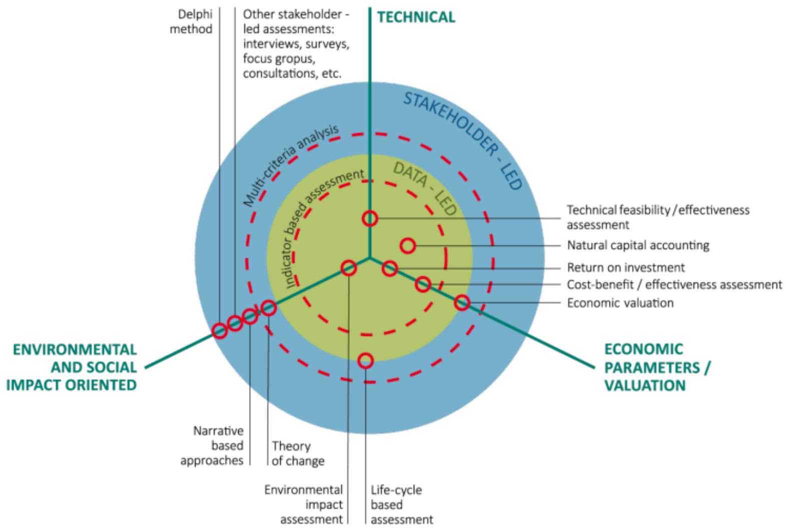


Figure 6: Mapping of NbS assessment approaches based on the elements they focus on and whether they are data- or stakeholder-driven (from Veerkamp et al., 2021).

Although the overall evaluation of NbS intervention is recommended to improve their planning and scaling-up, this can be a time-consuming and costly process. However, integrated, toolkit-type approaches are available that can greatly assist in a cost-efficient assessment of the benefits generated by ecosystem services at a site. For example, the Toolkit for Ecosystem Service Site-based Assessment (TESSA) developed in 2019 by collaborators from seven renowned organisations and universities. TESSA provides accessible guidance on low-cost methods for assessing the benefits people derive from nature, so that information can be gathered and used to influence decision making at a local level (see Box 5).

Box 5. TESSA – Toolkit for Ecosystem Service Site-Based Assessment

In order to understand and quantify the real value of nature-based solutions at particular locations, detailed site-specific information is needed, which can often be costly to collect. TESSA provides practical guidance on low-cost methods for evaluating the benefits people receive from nature by identifying, measuring and putting a meaningful value on ecosystem services in assessed locations. The toolkit includes methods ranging from household surveys and participatory mapping to quantitative biophysical assessments. The methods are designed to be applicable across all terrestrial and wetland habitats, but not marine areas. Current ecosystem services included in the toolkit are: global climate regulation, water services (supply, quality, flood reduction), harvested wild goods, cultivated goods, nature-based recreation, cultural services, pollination services and coastal protection. Find out more about TESSA **here**.

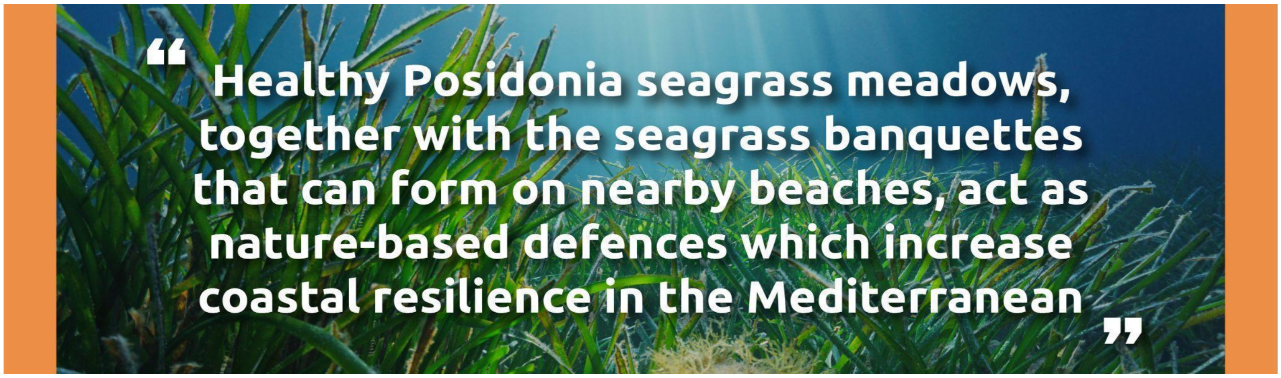
Implementing NbS for Mediterranean coastal zones

There are a significant number of existing projects in the Mediterranean that use NbS to address the societal and environmental challenges facing coastal and marine areas. Improved knowledge, understanding and promotion of the various successful replication of NbS interventions in other sites. In this regard, and as highlighted in Section 3, the assessment and communication of the environmental, social and economic impacts of NbS therefore plays a highly important role.

Over the last decade, several public-private funding programmes have supported the development of NbS-type projects in the Mediterranean, for example EU-Life (e.g. LIFE Blue Natura and LIFE Ebro - Admiclim), EU-Horizon 2020 (e.g. Future Mares and AQUACROSS) and EU-Interreg MED (see examples in tables below). From 2016 and 2019, the EU-Interreg MED PANACeA project was implemented in the Mediterranean to streamline management efforts in Protected Areas for enhanced biodiversity conservation in the Mediterranean. The second phase of this project (2019-2022), the Mediterranean Biodiversity Protection Community (MBPC) is building on PANACeA's achievements to increase the impact of its modular projects. Both phases have contributed to unlocking the deployment of NbS in Mediterranean coastal zones. A selection of thematic projects demonstrating the relevance of using a NbS to conserve coastal and marine ecosystems while addressing societal challenges of Mediterranean coastal communities, are provided below. A more exhaustive and detailed list of NbS projects implemented in the Mediterranean coastal zones is available in the Annex.

1) Project examples for the protection and/or restoration of "blue carbon" sinks in the Mediterranean

Project	**POSBEMED** (2016-2019)	**POSBEMED2** (2019-2022)
Lead Partner	Entente Interdépartementale de Démoustication Méditerranée (EID-MED, France)	Autonomous Region of Sardinia – Department of the Environment – Nature Conservation and Forestry Policies Office (RAS, Italy)
Societal challenges	- Climate change mitigation and adaptation - Disaster risk reduction - Human well-being - Endangered biodiversity and habitat loss	
NbS concepts	Ecosystem-based management of the Posidonia-beach-dune system **NI, EbA, ICZM, Eco-DRR, Area-based conservation / MPAs**	
Socio-economic contributions	- Establishment of a transnational integrated strategy and action plan to implement sustainable beach and coastal management practices across Mediterranean areas - Contribution to risk mitigation of climate change impacts (carbon sequestration, nature-based coastal defences minimising beach erosion and stabilising sand dunes). - Promoting and testing new approaches for the sustainable management of Posidonia landscape and beaches with Posidonia banquettes in seven coastal protected area sites in Spain, Cyprus, Greece, France, Italy and Croatia. - Capacity training for key stakeholders to promote dialogue processes, engagement and recognition of the role of banquettes in beach ecosystems.	
Environmental benefits	- Conservation of the Posidonia littoral zone habitats resiliency (biodiversity, ecosystem services). - Creation of a baseline for a common transnational monitoring programme of Posidonia littoral zone habitats in Mediterranean MPAs.	
Conditions of replicability	- Production and dissemination of a guide on existing methods and tools for the sustainable use of seagrass banquettes and associated dune systems. - Production and dissemination of a toolkit with recommendations for the sound management of Posidonia and dune systems.	
More information	https://posbemed.interreg-med.eu/	https://posbemed2.interreg-med.eu/



2) Project examples for strengthening the resilience of coastal and marine ecosystems in the Mediterranean

Project	**MPA Adapt** (2016-2019)	**MPA Engage** (2019-2022)
Lead Partner	Institute of Marine Sciences of the Spanish National Research Council (Spain)	
Societal challenges	- Climate change mitigation and adaptation - Disaster risk reduction - Economic and social development - Endangered biodiversity and habitat loss	
NbS concepts	**EbM, EbA, EcoDRR, Area-based conservation / MPAs**	
Socio-economic contributions	- Improving the dialogue and coordination between MPA managers and scientists. - Development of toolkits and protocols to support harmonised approaches on risk assessment and monitoring of climate change effects within MPAs. - Creation of training/tutorial modules for practitioners.	- Risk assessment of how climate change affects or will affect the socio-economic components of MPAs. - Cost-effectiveness analysis - Promotion of citizen science to increase monitoring capacity on site (eg. partnership with PADI to involve recreational diving centres in monitoring activities) - Raising awareness to support the adoption of new monitoring protocols into regional or local regulation measures. Developing adaptation activities with a participatory approach.
Environmental benefits	- Increasing connectivity between MPAs. - A better understanding of how MPA ecosystems are changing in response to climate change. - Coordinated data collection and scientific monitoring within partner MPAs will help define and implement adaptation actions to strengthen the resilience of MPA ecosystems.	
Conditions of replicability	- Foster the transfer of knowledge, data and tools already developed through live and online seminars with local and regional partners. - Support MPAs in integrating the tools and protocols developed into their operational frameworks. - Build a network of scientific experts on issues related to climate change adaptation in MPAs.	
More information	https://mpa-adapt.interreg-med.eu/	https://mpa-engage.interreg-med.eu/

3) Project examples for the implementation and/or promotion of sustainable fishing practices in the Mediterranean

Project	**FISHMPABLUE2** (2016-2019) Interreg Mediterranean FishMPABlue 2 FishMPABlue 2 PLUS	**FISHMPABLUE2+** (2019-2022)
Lead Partner	Federparchi – Europarc Italy	
Societal challenges	- Climate change mitigation and adaptation - Food security - Economic and social development - Endangered biodiversity and habitat loss	
NbS concepts	**EbM, EbMi, EbA, Area-based Conservation / MPAs**	
Socio-economic contributions	- Small Scale Fishers (SSF) Governance Toolkit : 12 management measures subdivided into 5 "enabling conditions" for a successful governance system of SSF: MPA enforcement (surveillance and monitoring), fishers engagement in MPA decision making, knowledge and ownership, sustainable and profitable fishing. - SSF Local Governance Cluster (LGC) established in the 11 pilot MPAs (consisting of an MPA managing body and SSF-related fishers). - Tools from the "SSF Governance toolkit" implemented in each of the 11 MPAs through the Pilot Project Implementation Plan (PPIP) adoption by each SSF LGC. - Monitoring campaigns of environmental-socio-economic features of SSF in each pilot MPA carried out before and after the PPIP implementation.	
Environmental benefits	- Creation of an overall roadmap for the sustainable management of marine ecosystems, based on the Social-Ecological Systems approach. - Increasing cooperation between MPAs and fishers, thus increasing the effectiveness of conservation measures. - Improving the capacities of the MPAs staff members in regulating SSF and monitoring its impacts on the environment.	
Conditions of replicability	- Presentation of the Toolkit during workshops, webinars and press releases to a vast number of stakeholders (MPAs managers, fishers associations, local and national policymakers, practitioners, scholars, etc.). - Transfer of the integrated SSF monitoring methodology to eight additional MPAs managers and one national (Montenegro) MPA-related Agency. - Ad hoc and field training activities (eg. summer school) organised to assure a reliable monitoring system while applying the Toolkit.	
More information	https://fishmpablue-2.interreg-med.eu/	

4) Project examples for establishing and/or conserving Mediterranean coastal setback areas

Project	**WETNET** (2016-2019)	**TUNE UP** (2019-2022)
Lead Partner	Veneto Region (Italy)	ANATOLIKI SA (Greece)
Societal challenges	- Climate change mitigation and adaptation - Disaster risk reduction - Economic and social development / human well-being - Endangered biodiversity and habitat loss	
NbS concepts	**EbM, EbA, EbMi, Eco-DRR, Area-based Conservation / MPAs**	
Socio-economic contributions	- Formal adoption of the "Wetland Contract" (a voluntary based governance process where public and private stakeholders can participate in the sustainable management of protected wetlands) in 9 pilot areas. - The Wetland contract helps limit or solve conflicts between conservation issues and socio-economic issues (eg. small-scale fisheries). - Program of 55 actions related to the management of water resources implemented, which outlines the responsibilities for the implementation of actions aimed at protecting wetland areas, supporting sustainable socio-economic development and effective governance.	- Improved MPA management effectiveness through the integration of multilevel governance tools into national and regional policy instruments. - Production of the "Joint methodology for MPA Contracts implementation" to mainstream the Contract tool into the local/regional regulatory framework. - More intensive transnational cooperation and networking between stakeholders from Mediterranean wetland protected areas.
Environmental benefits	- Higher coordination between different levels of spatial planners and authorities in charge of wetland management, thereby improving wetland conservation and resilience. - Greater awareness in local stakeholders of the fragility of wetland ecosystems and pressures on them. - Empowerment of local stakeholders to better monitor the quality of the Mediterranean wetlands and to identify the biodiversity hotspots most exposed to human and climate impacts.	
Conditions of replicability	- Disseminate WETNET/TUNE-UP experiences implementing the Wetlands Contracts in other Mediterranean areas (e.g. organisation of capitalization seminars). - Develop a Good Practice Database for Mediterranean wetland areas. - Promote the embedding of MPA Contracts at Mediterranean level, through a set of political recommendations to be delivered to the EC and to Regional Authorities.	
More information	https://wetnet.interreg-med.eu/	https://tune-up.interreg-med.eu/

Key factors for mainstreaming NbS in Mediterranean coastal zones

Nature-based Solutions have become a key priority for mainstreaming environmental protection and the sustainable use of biodiversity in the Mediterranean (Canals Ventin and Lazaro, 2019). However, their uptake and application are still insufficient, largely due to their dependence on decisions taken at the country level. Several factors can facilitate the mainstreaming of NbS and their integration into regional, national and local funding schemes. The experience gained from the implementation of existing NbS in the Mediterranean coastal zones, including the Interreg Med PANACeA/MBPC modular projects, demonstrates the importance of documenting and sharing lessons learnt at each stage of the NbS implementation cycle through communication, awareness raising and capacity building activities. Outlining NbS socio-economic-environmental performances, as well as key factors for transferability, are also critical to replicate successful NbS to other areas facing similar issues. Local cooperation and partnerships can foster this replication but this must go hand in hand with broad and strong political commitment and societal support (IUCN, 2020). In other words, mainstreaming NbS in Mediterranean coastal zones cannot be achieved without supporting local practitioners like MPA managers to integrate and adapt the tools already developed by other NbS projects to their local contexts. This also means securing dedicated funding and human resources to ensure the efficient transfer and adoption of NbS outcomes to other coastal and marine areas. Finally, the networking of NbS projects, through relevant actors, will strengthen the integration and use of NbS at the Mediterranean basin level and ensure an even more substantial impact.

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REFERENCES

Abdul Malak, D., Marin, A.I., Trombetti, M., San Roman, S. 2021 Carbon pools and sequestration potential of wetlands in the European Union, European Topic Centre on Urban, Land and Soil Systems, Vienna and Malaga. ISBN 978-3-200-07433-0.

Andrade Pérez, A., Herrera Fernández, B., Cazzolla Gatti, R. (Eds.). 2010. Building Resilience to Climate Change: Ecosystem-Based Adaptation and Lessons from the Field; IUCN: Gland, Switzerland.

Bahri, T., Vasconcellos, M., Welch, D.J., Johnson, J., Perry, R.I., Ma, X. & Sharma, R. (Eds.). 2021. Adaptive management of fisheries in response to climate change. FAO Fisheries and Aquaculture Technical Paper No. 667. Rome, FAO. https://doi.org/10.4060/cb3095en.

CBD (Convention of Biological Diversity). 2009. Connecting Biodiversity and Climate Change Mitigation and Adaptation: Report of the Second Ad Hoc Technical Expert Group on Biodiversity and Climate Change. CBD Technical Series 41. Montreal, Canada

Canals Ventín, P. and Lázaro Marín, L. 2019. Towards Nature-based Solutions in the Mediterranean. IUCN Centre for Mediterranean Cooperation, Spain.

Cohen-Shacham, E., Walters, G., Janzen, C. and Maginnis, S. (eds.). 2016. Nature-based Solutions to address global societal challenges. Gland, Switzerland: IUCN. xiii + 97 pp.

European Commission, 2013. Mapping and assessment of ecosystems and their services. An analytical framework for ecosystem assessments under action 5 of the EU biodiversity strategy to 2020. Technical Report - 2013 – 067. Publications Office of the European Union, Luxembourg.

European Commission. 2015. Towards an EU Research and Innovation policy agenda for Nature-Based Solutions & Re-Naturing Cities. https://doi.org/10.2777/765301

IUCN. 2017. Issues brief: Marine Protected Areas and Climate Change.

IUCN. 2020. Global Standard for Nature-based Solutions. A user-friendly framework for the verification, design and scaling up of NbS. First edition. Gland, Switzerland: IUCN.

IUCN.a. 2021. Manual for the creation of Blue Carbon projects in Europe and the Mediterranean, Otero, M. (Ed)., 144 pp.

IUCN.b. 2021. Feasibility study the preparation of Blue Carbon offsetting projects in Andalucía, Spain. Otero, M (Ed). Pages 180.

Jentoft, Svein. 2005. Fisheries co-management as empowerment. Marine Policy, Elsevier. 29. 1–7. 10.1016/j.marpol.2004.01.003.

Lecerf, M., Herr D., Thomas, T., Elverum, C., Delrieu, E. and Picourt, L. 2021. Coastal and marine ecosystems as Nature-based Solutions in new or updated Nationally Determined Contributions, Ocean & Climate Platform, Conservation International, IUCN, GIZ, Rare, The Nature Conservancy and WWF.

Mediterranean Wetlands Observatory, 2012. Biodiversity – Status and trends of species in Mediterranean wetlands. Thematic collection, issue # 1. Tour du Valat, France. 52 pages. ISBN: 2-910368-58-0.

Mossone P., Guala I., Heurtefeux H., Giunta Fornasin M.E., Issaris Y., Gerakaris V., Salomidi M., Milano P., Guido M., Marciano V., Otero M.M., Aljinovic B., Simeone S., 2018. POSBEMED: Posidonia beach/dunes socio- economic evaluation. Final Report. IMC Foundation - International Marine Centre, Technical report 2:2018, 70 pp. + Annexes.

Pergent, G., Bazairi, H., Bianchi, C., Boudouresque, C., Buia, M., Calvo, S., Clabaut, P., Harmelin-Vivien, M., Mateo, M., Montefalcone, M., Morri, C., Orfanidis, S., Pergent-Martini, C., Semroud, R., Serrano, O., Thibaut, T., Tomasello, A., & Verlaque, M. 2014. Climate change and Mediterranean seagrass meadows: a synopsis for environmental managers. Mediterranean Marine Science, 15(2), 462-473.

Pittman, J., Gianelli, I., Trinchín, R., Gutiérrez, N., de la Rosa, A., Martínez, G., Masello, A. and Defeo, O. 2019. Securing sustainable small-scale fisheries through comanagement: the yellow clam fishery in Uruguay. In Westlund, L. & Zelasney, J., eds. Securing sustainable small-scale fisheries: sharing good practices from around the world, pp. 9–37. FAO Fisheries and Aquaculture Technical Paper No. 644. FAO, Rome.

Plan Bleu. 2019. Outsmart climate change: work with nature! Enhancing the Mediterranean's climate resilience through Nature-based Solutions. Policy paper. 24pp.

Powell, E. J., Tyrrell, M. C., Milliken, A., Tirpak, J. M., and Staudinger, M. D. 2019. A review of coastal management approaches to support the integration of ecological and human community planning for climate change. J. Coast. Conserv. 23, 1–18. doi: 10.1007/s11852-018-0632-y

Raymond, C.M., Berry, P., Breil, M., Nita, M.R., Kabisch, N., de Bel, M., Enzi, V., Frantzeskaki, N., Geneletti, D., Cardinaletti, M., Lovinger, L., Basnou, C., Monteiro, A., Robrecht, H., Sgrigna, G., Munari, L. and Calfapietra, C. 2017. An Impact Evaluation Framework to Support Planning and Evaluation of Nature-based Solutions Projects. Report prepared by the EKLIPSE Expert Working Group on Nature-based Solutions to Promote Climate Resilience in Urban Areas. Centre for Ecology & Hydrology, Wallingford, United Kingdom. ISBN: 978-1-906698-62-1

Rigaud, A., Van De Walle, G., Guérin, B., Binet, T. 2018. FARNET Guide 16: Strengthening local resource management. European Commission, Directorate-General for Maritime Affairs and Fisheries, Director-General. ISBN 978-92-79-90707-4.

Roberts, C.M., O'Leary, B.C., McCauley, D.J, Cury, P.M., Duarte, C.M., Lubchenco, J., Pauly, D., Sáenz-Arroyo, A., Sumaila, U.R., Wilson, R.W., Worm, B., and Castilla, J.C. 2017. Marine reserves can mitigate and promote adaptation to climate change. PNAS June 13, 2017 114 (24) 6167-6175; first published June 5, 2017; https://doi.org/10.1073/pnas.1701262114.

Segura L., M. Thibault & B. Poulin. 2018. Nature based Solutions: Lessons learned from the restoration of the former saltworks in southern France. Tour du Valat. France.

Stephenson, S. and Johnson, A.F. 2021. Shifting gears: achieving climate smart fisheries. Published by WWF, RSPB and Marine Conservation Society.

Steven, A.D.L., Appeaning Addo, K., Llewellyn, G., Vu, T.C. et al. 2020. Coastal Development: Resilience, Restoration and Infrastructure Requirements. Washington, DC: World Resources Institute.

Tour du Valat. 2018. Mediterranean Wetlands Outlook 2: Solutions for sustainable Mediterranean Wetlands, 2018, Tour du Valat, France.

UNEP. 2006. Ecosystem-based management : markers for assessing progress. ISBN: 92-807-2707-9.

UNEP. 2011. Taking Steps toward Marine and Coastal Ecosystem-Based Management - An Introductory Guide. ISBN: 978-92-807-3173-6

UNEP. 2016. Options for Ecosystem-based Adaptation (EBA) in Coastal Environments: A Guide for environmental managers and planners. UNEP, Nairobi.

UNEP. 2019. New UN Decade on Ecosystem Restoration offers unparalleled opportunity for job creation, food security and addressing climate change opportunity. Press release - 01 March 2019, New York.

UNEP-WCMC. 2019. Clarifying terms used in "area-based conservation":
A contribution to the post-2020 global biodiversity framework. Discussion document.

Veerkamp, C., Ramieri, E., Romanovska, L., Zandersen, M., Förster, J., Rogger, M., Martinsen, L. 2021. "Assessment Frameworks of Nature-based Solutions for Climate Change Adaptation and Disaster Risk Reduction". European Topic Centre on Climate Change impacts, Vulnerability and Adaptation (ETC/CCA) Technical Paper 2021/3. DOI: https://doi.org/10.25424/cmcc/NBS_assessment_approaches

WWF. 2021. The climate change effect in the Mediterranean. Six stories from an overheating sea. WWF Mediterranean Marine Initiative, Rome, Italy, 2021

Zhu, X., Linham, M. M., & Nicholls, R. J. 2010. Technologies for Climate Change Adaptation - Coastal Erosion and Flooding. Danmarks Tekniske Universitet, Risø Nationallaboratoriet for Bæredygtig Energi. TNA Guidebook Series. ISBN: 978-87-550-3855-4.

ANNEX - DETAILED LIST OF NBS PROJECTS IMPLEMENTED IN MEDITERRANEAN COASTAL ZONES

Category of actions:
1. Protect/restore "blue carbon" sinks
2. Strengthen coastal/marine ecosystems resilience
3. Implement / foster sustainable fishing practices
4. Establish / conserve coastal setback zones

POSBEMED				CATEGORY OF ACTIONS: **1** (highlighted) · 2 · 3 · 4
Countries	Cyprus, Greece, France, Italy, Spain	**Goal/ objectives**	POSBEMED looked at management, conflicts and opportunities of the Mediterranean, in coastal protected and Natura 2000 areas where interdependence between seagrass meadows, dunes and beaches occurs, to provide a strategy and governance model for enhancing the management of these areas and beyond. The project objectives were to: • Identify and analyse the current management practices of Posidonia beaches/dunes systems and banquettes in Mediterranean countries and provide a socioeconomic evaluation synthesis of its ecosystem services. • Integrate and adapt tools for management of Posidonia beach/dunes in local sustainable growth and good practice guidelines for a holistic and integrated approach in conservation and management efforts. • Propose a model of governance and a common strategy for the management of Posidonia beach/dune systems in the Mediterranean Natura 2000 sites and other coastal protected areas.	
Duration	From November 2016 until April 2018 (18 months)			
NbS concepts	EbM of Posidonia - beach - dune system NI, EbA, ICZM, Eco-DRR			
Main Partner	This project was led by the Entente Interdépartementale de Démoustication Méditerranée and involved 5 other partners	**Key results**	A socioeconomic evaluation study was performed with a view to examining beach users' and managers perceptions and expectations. Existing management practices for Posidonia oceanica banquettes were also surveyed. A series of operational recommendations for Beach Managers were formulated to encourage better management practices on Posidonia oceanica banquettes, along with displacement options. A transnational integrated strategy and action plan was established to guide regional and national policies, funding bodies and research institutions towards creating suitable conditions for implementing sustainable beach and coastal management practices across Mediterranean areas.	
Resources	https://posbemed.interreg-med.eu/			
Budget	596 750 €			

POSBEMED 2				CATEGORY OF ACTIONS: **1** (highlighted), 2, 3, 4
Countries	Cyprus, Spain, Macedonia and Attika (Greece), Provence-Alpes-Côte d'Azur (France), Zadar (Croatia), Sardinia (Italy)	**Goal/ objectives**	The POSBEMED2 project has a vision of promoting new approaches and solutions for a sustainable management of Posidonia landscape and beaches with Posidonia banquettes in Protected Areas across the Mediterranean, by implementing and testing intervention measures, as well as preparing monitoring protocols and management interventions in at least 11 coastal PA sites in Spain, Cyprus, Greece, France, Italy and Croatia.	
Duration	Nov. 2019 ending in June 2022			
NbS concepts	EbM of Posidonia - beach - dune system, NI, EbA, ICZM, Eco-DRR			
Main Partner	This project is led by the Autonomous Region of Sardinia (RAS, Italy), and involves 7 other partners	**Key results**	Create the baseline for a common transnational monitoring programme that will further explore the use of advanced technologies. The broad set of tools and approaches with local stakeholder involvement and capacity training for key groups will promote dialogue processes, engagement and recognition of the role of banquettes in beach ecosystems. Tasks currently ongoing: • Promote and test new approaches for the sustainable management of Posidonia landscape and beaches with Posidonia banquettes in 7 coastal protected area sites in Spain, Cyprus, Greece, France, Italy and Croatia. • Provide capacity training for key stakeholders to promote dialogue processes, engagement and recognition of the role of banquettes in beach ecosystems.	
Resources	https://posbemed2.interreg-med.eu/			
Budget	2 767 717 €			

LIFE Blue Natura

CATEGORY OF ACTIONS			
1	2	3	4

Countries	Spain	**Goal/ objectives**	Andalusian blue carbon for climate change mitigation: quantification and valorisation mechanisms for marine and coastal habitats.The project contributed towards a better understanding of the carbon stocks and flows of the Posidonia oceanica sinks in the Andalusian Mediterranean, the seagrass beds in the Bay of Cádiz, the salt marsh sinks in the Bay of Cádiz and the Odiel salt marshes. The main objectives were: 1. Filling knowledge gaps on blue carbon ecosystems along the coast of Andalucía 2. Incorporating blue carbon ecosystems into climate strategies 3. Addressing existing policies and requirements to maintain healthy ecosystems
Duration	August 2015 and will finish by March 2020		
NbS concepts	AbC / EbM Ecosystem-based mitigation / Area-based conservation.		
Main Partner	Ministry of Agriculture, Fishery, and Sustainable Development of the Junta de Andalucía (Regional Government of Andalucía)	**Key results**	From 2016 to 2018 the team measured carbon stocks and fluxes in the designated areas. During implementation phase (March 2020) the project: • Defined and prioritised criteria for the definition of Blue Carbon projects and selection of specific criteria for wetlands and Posidonia; • Developed a catalogue of projects for restoring coastal and marine habitats that can be offered within the Andalusian Emission Offsets System (SACE). It provides decision-makers with turnkey elements to help finance conservation projects and the restoration of habitats of blue carbon sinks in Andalusia. This catalogue includes NbS based on carbon offset projects (additions + avoided emissions). This could potentially help the conservation of blue carbon ecosystems, particularly if included in national carbon offset inventories and/or strategies with private industries.
Resources	http://life-bluenatura.eu/en/home/ https://www.iucn.org/sites/dev/files/content/documents/towards_nature-based_solutions_in_the_mediterranean.pdf		
Budget	2.513.792 €		

Marine forest project

CATEGORY OF ACTIONS			
1	2	3	4

Countries	Spain	**Goal/ objectives**	The Red Eléctrica Marine Forest is a pioneering project worldwide for the recovery of Posidonia oceanica seagrass meadows in Majorca. The main objective of the Red Eléctrica Marine Forest is the recovery of the marine habitat of Posidonia oceanica seagrass meadows to offset the loss of this marine environment. Together with this, this project pursues three general objectives: i) to promote the conservation of biological diversity, protecting an essential species for the sustainability of the Mediterranean's marine ecosystems; ii) to promote research and development and the use of new technologies and processes, in order to avoid or minimise environmental impacts; and iii) to adopt a commitment to the fight against climate change. All of these are in line with the Company's 2030 Sustainability Commitment.
Duration	2017 - ongoing		
NbS concepts	Ecosystem restoration / EbM / Area-based conservation /		
Main Partner	Red Eléctrica de España	**Key results**	• After one year of planting, the survival rate was over 60%; 51% of the fragments planted in 2016 had generated new shoots after 6 months, 18% of the fragments had generated new shoots after 1 year. • A review in 2020 showed a confirmed survival rate of >90%. • REE has published a methodological guide on developing an open seagrass meadow recovery method including technical, material and economic viability. Find it here. • A separate research project from 2020-21 also showed that Posidonia has considerable positive effects for combatting ocean plastic, as it filters these and fuses them with natural fibre bundles called 'Neptune Balls' • In 2021, REE announced that they would, together with the Regional Ministry of the Environment and Territory of the Balearic Islands and the Mediterranean Institute for Advanced Studies (IMEDEA), carry out a four-year long planned control and monitoring programme - read more here. • In 2021, a virtual exhibition was launched, which is available on REE's website in Spanish and allows interested readers to learn much more about the project and value of Posidonia Oceanica
Resources	https://www.ree.es/en/sustainability/noteworthy-projects/environmental-projects/posidonia-oceanica		
Budget			

MPA Engage				CATEGORY OF ACTIONS: 1 / **2** / 3 / 4
Countries	Albania, Croatia, France, Greece, Italy, Malta, Spain	**Goal/ objectives**	MPA-ENGAGE is Engaging key Mediterranean actors in an ecosystem approach to manage Marine Protected Areas for Climate Change. The project aims to support Mediterranean MPAs in adapting to and mitigating climate change effects in the Mediterranean Sea. Its main goal is to put Mediterranean Marine Protected Areas in the frontline of climate change adaptation. Using a participatory approach, MPA-Engage will: • Monitor climate change impacts in a harmonised way. • Elaborate vulnerability assessments. • Develop climate change adaptation action plans in 8 Marine Protected Areas located in 6 Mediterranean countries.	
Duration	11/2019 – 06/2022 (32 months)			
NbS concepts	Increasing connectivity of MPAs EbM EbA			
Main Partner	15 project partners, led by the Institute of Marine Sciences of the Spanish National Research Council (CSIC)	**Key results**	• Engage local communities, small-scale fishers and citizen scientists in monitoring climate change impacts • Promote MPAs as nature-based solutions for climate change adaptation • Facilitate Mediterranean policy dialogue with scientists, MPA managers, decision-makers, environmental NGOs and socio-economic stakeholders on climate change adaptation strategies. The Project outcomes will provide a framework for guiding regional climate change adaptation and mitigation actions.	
Resources	https://mpa-engage.interreg-med.eu/			
Budget	3 000 000 €			

MPA ADAPT

CATEGORY OF ACTIONS			
1	**2**	3	4

Countries	Spain, France, Italy, Croatie, Malta	**Goal/ objectives**	The MPA-Adapt project was developed to tackle those challenges through a multi-level approach. Five marine protected areas from three Mediterranean countries were chosen to act as pilot sites for the development of climate change adaptation action plans and their integration into existing management frameworks. The specific objectives of the MPA-Adapt are: • To raise awareness of the role of effective MPAs for enhancing resilience to Climate change and safeguarding ecosystem services as well as contributing to adaptation measures. • To strengthen the capacity of MPAs to plan for and respond to climate change impacts based on a better understanding of climate risk and vulnerability. • To showcase how climate change can be integrated into planning and management of Mediterranean MPAs.
Duration	01/2016 - 04/2019		
NbS concepts	Increasing connectivity of MPAs EbM EbA Eco-DRR		
Main Partner	15 project partners, led by the Institute of Marine Sciences of the Spanish National Research Council (CSIC)	**Key results**	The inclusion of key coastal actors in the project (such as local administrations, fishermen and divers) contributed to linking MPA management to integrated coastal management and provided information about the impact of climate change on biodiversity and ecosystem services justifying investment in further mitigation and adaptation measures. The main activities focused on: • Engaging local communities, small-scale fishers and citizen scientists in monitoring climate change impacts • Promoting MPAs as nature-based solutions for climate change adaptation • Facilitating Mediterranean policy dialogue with scientists, MPA managers, decision-makers, environmental NGOs and socio-economic stakeholders on climate change adaptation strategies.
Resources	https://mpa-adapt.interreg-med.eu/		
Budget	1 904 257 €		

<table>
<tr><th colspan="3">AMAre / AMAre PLUS</th><th>CATEGORY OF ACTIONS
1 | 2 | 3 | 4</th></tr>
<tr><td>Countries</td><td>Spain, Italy, Greece, Malta, France</td><td rowspan="3">Goal/ objectives</td><td rowspan="3">The AMAre project – Actions for Marine Protected Areas – aimed to improve the efficiency of MPAs by studying the distribution and the effects of human threats using shared and coordinated methodologies developed together with local stakeholders. The main objectives of AMAre project were:

• To develop shared methodologies and geospatial tools for multiple stressors assessment, coordinated environmental monitoring, multi-criteria analyses and stakeholder engagement;
• To develop concrete pilot actions and coordinated strategies in selected Marine Protected Areas (MPAs) to solve hot spots of conflicts affecting marine biodiversity and the services it provides.</td></tr>
<tr><td>Duration</td><td>Nov. 2016- Oct. 2019 (36 months) 2021-2022</td></tr>
<tr><td>NbS concepts</td><td>Increasing connectivity of MPAs EbM</td></tr>
<tr><td>Main Partner</td><td>10 project partners, led by CONISMA (Italy)</td><td rowspan="3">Key results</td><td rowspan="3">The final aim was to scale up strategies and recommendations at transnational level adopting an ecosystem-based approach while also considering the goals of the Marine Strategy Framework Directive across MPAs.

• Developed geospatial tools for marine ecosystem management (https://amare.interregmed.eu/toolbox/geoportal)
• Produced maps to display conflicts of interest within the selected MPA sampling activities to assess the ecological status of vulnerable habitats and coralligenous formations)</td></tr>
<tr><td>Resources</td><td>https://amare.interreg-med.eu/</td></tr>
<tr><td>Budget</td><td>2 700 000 €</td></tr>
</table>

COGITO				CATEGORY OF ACTIONS: 1 / **2** / 3 / 4
Countries	Maroc, Algérie, Tunisie, Albanie, Turquie, Liban	**Goal/ objectives**	The overall aim of the project is to enhance the integrated and sustainable management of coastal, insular and marine protected areas in the Mediterranean (COGITO).The overall objective is to contribute to the support and consolidation of integrated management and resilience processes of Mediterranean coastal, island and marine areas, for the benefit of ecosystems and local communities, while at the same time integrating the challenges of co-management of targeted territories, in order to reproduce them in the long term, on a larger scale.	
Duration	2018-2022			
NbS concepts	Increasing connectivity of MPAs EbM. Area-based conservation EbA			
Main Partner	MedPAN, l'initiative pour les Petites Îles de Méditerranée (PIM), WWF Med Initiative, le Conservatoire du Littoral	**Key results**	• Consolidate the pilot initiatives of the previous project and support new pilot sites for the co-management of coastal, island and marine territories. • Strengthen the capacities of institutions, site managers and their partners. • Develop advocacy and awareness for integrated co-management of territories at the national, regional and international levels. • Develop and enhance scientific knowledge for management and policy. • Concrete results have already been obtained on pilot sites in terms of effective co-management of natural areas and financing mechanisms.	
Resources	http://medpan.org/main_activities/projects/cogito-project/			
Budget	1 000 000 €			

Plastic Busters MPAs				CATEGORY OF ACTIONS: 1 · **2** · 3 · 4
Countries	Italy, France, Spain, Greece, Albania, Croatia (Montenegro and Slovenia in 2021)	**Goal/ objectives**	Plastic Busters MPAs provides a comprehensive, multifaceted and coordinated approach for healthy marine ecosystems by fighting marine litter in Mediterranean coastal and marine protected areas.	
Duration	Feb 2018 to Jan 2022 (48 months)			
NbS concepts	Reducing pollution and other anthropogenic pressures			
Main Partner	15 implementing partners, led by Italian National Institute for Environmental Protection and Research (ISPRA)	**Key results**	Throughout its lifespan, Plastic Busters MPAs contributed to both policy and scientific advances with regard to marine litter in the Mediterranean, and provided an opportunity for creating synergies and fostering exchanges. The main achievements are: • A harmonised approach for monitoring macro- and microliter in Mediterranean pelagic and coastal MPAs. • Assess the marine litter impacts on biota dwelling in MPAs. • Develop a forecasting model to identify marine litter hotspots in Mediterranean MPAs. • Set-up and implement at least 10 marine litter demonstration projects in pilot MPAs. • Implement fit-for-purpose knowledge transfer, capitalisation and replication mechanisms to create a truly enabling environment for concrete, effective and continuous actions against marine litter in a network of Mediterranean MPAs • Set up a joint governance plan for managing marine litter in pelagic and coastal MPAs	
Resources	https://plasticbustersmpas.interreg-med.eu/			
Budget	5 055 000 €			

ACT4LITTER				CATEGORY OF ACTIONS: 1 / **2** / 3 / 4
Countries	Albania, Belgium, Croatia, Cyprus, France, Greece, Italy, Montenegro, Slovenia, Spain	**Goal/ objectives**	ACT4LITTER reviewed the most promising proposed measures to effectively tackle the issue of Marine Litter and selected those that could be implemented in MPAs, particularly the ecosystem services.	
Duration	Feb 2017 to Jul 2018 (18 m.)			
NbS concepts	Reducing pollution and other anthropogenic pressures			
Main Partner	4 partners, led by Catalan Waste Agency – Regional Activity Centre for Sustainable Consumption and Production	**Key results**	• Identified potential measures to address marine litter issues in Mediterranean MPAs in particular those that promote prevention upstream. • Conducted a feasibility assessment of the identified measures to be implemented in MPAs through the development of an appropriate decision-making model. • Developed 10 MPA-specific action plans for preventing and mitigating marine litter through a participatory approach. • Elaborated a joint governance plan for improving marine litter management in Mediterranean MPAs through the integration of relevant lessons learnt.	
Resources	https://act4litter.interreg-med.eu/			
Budget	599 496 €			

<table>
<tr><td colspan="4">Corso Commune coastal dune ecosystem rehabilitation project</td><td>CATEGORY OF ACTIONS
1 | 2 | 3 | 4</td></tr>
<tr><td>Countries</td><td>Algeria</td><td rowspan="3">Goal/ objectives</td><td colspan="2" rowspan="3">Diagnosis of the coastal dune ecosystem, identification of the causes and pressures suffered and the deterioration observed in biodiversity and rehabilitation of the ecosystem and the site.</td></tr>
<tr><td>Duration</td><td>2012- 2014</td></tr>
<tr><td>NbS concepts</td><td>Ecological restoration</td></tr>
<tr><td>Main Partner</td><td>Algerian Ministry of Foreign Affairs (MAE), UNDP, Wilaya de Boumerdes, Corso Commune</td><td rowspan="3">Key results</td><td colspan="2" rowspan="3">To allow restoration and rehabilitation of the dunes, the Ecological Association of Boumerdes, in agreement and cooperation with the local public authorities concerned, took urgent protective measures for: - The defence of certain lithological formations which undergo intense natural erosion due to the insufficiency of the vegetation cover in place, rare biotopes and the cyclic human-made deterioration.
The revegetation with native species that anchor dunes such as marram grass (Ammophila arenaria)
The rehabilitation and protection of the site against human action by implementation of actions for cleaning and development of spaces.</td></tr>
<tr><td>Resources</td><td>Towards Nature-based Solutions in the Mediterranean</td></tr>
<tr><td>Budget</td><td>3 361 275 $</td></tr>
</table>

AQUACROSS - Case study #2

CATEGORY OF ACTIONS			
1	2	3	4

Countries	Spain, Morocco	**Goal/ objectives**	AQUACROSS (Knowledge, Assessment, and Management for AQUAtic Biodiversity and Ecosystem Services aCROSS EU policies) is a Horizon 2020 project which aims to support EU efforts to protect aquatic biodiversity and ensure the provision of aquatic ecosystem services. Its Case Study #2 is particularly relevant for this factsheet: Analysis of transboundary water ecosystems and green/blue infrastructures in the Intercontinental Biosphere Reserve of the Mediterranean Andalusia (Spain) – Morocco. The AQUACROSS Assessment Framework was applied to develop and design a multi-purpose Green and Blue Infrastructure. This included: • Analysing regional activities, pressures, ecosystem condition, biodiversity, and key aquatic ecosystem services; • Identifying stakeholder objectives: synergies, conflicts, and opportunities for improvement; • Green and Blue Infrastructure design based on spatial conservation prioritisation and modelling of biodiversity features and ecosystem services; • Identifying the best spatial allocation for an ecosystem-based management plan for the restoration of degraded ecosystems; • Co-creation with local stakeholders: two rounds of workshops held in Tarifa (Spain, northern section) and Tangier (Morocco, southern section).
Duration	2012- 2014		
NbS concepts	EbM / Ecological restoration / CLR / Hybrid EE / Area-based conservation approaches		
Main Partner	Overall project : 16 partners, led by Ecologic Institute (Germany) For case study #2: lead partner is IOC-UNESCO in cooperation with REDIAM (Spain)	**Key results**	Identified key areas that allow biodiversity conservation, maintaining ecosystem services capacity, and restoring degraded ecosystems, while minimising costs. The results suggest that implementing ecosystem-based management restoration measures when designing Green and Blue Infrastructure may result in greater coverage, while improving connectivity across its core and conservation zones. In one single solution, Green and Blue Infrastructure combines in one single solution an ecosystem-based management outcome that balances conservation, restoration and exploitation objectives. The Green and Blue Infrastructure multi-zoning approach offers co-benefits in terms of ecosystem and biodiversity conservation as well as human well-being, while minimising the potential conflicts between conservation and exploitation goals.
Resources	https://aquacross.eu/content/case-study-2-analysis-transboundary-water-ecosystems-and-greenblue-infrastructures.html		
Budget	6 913 116,25 €		

FutureMARES

CATEGORY OF ACTIONS			
1	2	3	4

Countries	Germany, France, Italy, Greece, Israel, Denmark, Spain, Chile, UK, Portugal, Belize, Netherlands, Norway, Sweden, Finland	**Goal/ objectives**	AQUACROSS (Knowledge, Assessment, and Management for AQUAtic Biodiversity and Ecosystem Services aCROSS EU policies) is a Horizon 2020 project which aims to support EU efforts to protect aquatic biodiversity and ensure the provision of aquatic ecosystem services. Its Case Study #2 is particularly relevant for this factsheet: Analysis of transboundary water ecosystems and green/blue infrastructures in the Intercontinental Biosphere Reserve of the Mediterranean Andalusia (Spain) – Morocco. The AQUACROSS Assessment Framework was applied to develop and design a multi-purpose Green and Blue Infrastructure. This included: • Analysing regional activities, pressures, ecosystem condition, biodiversity, and key aquatic ecosystem services; • Identifying stakeholder objectives: synergies, conflicts, and opportunities for improvement; • Green and Blue Infrastructure design based on spatial conservation prioritisation and modelling of biodiversity features and ecosystem services; • Identifying the best spatial allocation for an ecosystem-based management plan for the restoration of degraded ecosystems; • Co-creation with local stakeholders: two rounds of workshops held in Tarifa (Spain, northern section) and Tangier (Morocco, southern section).
Duration	September 2020- August 2024 (48 months)		
NbS concepts	EbM / ER / CLR / Hybrid EE/ EbM / Eco-DRR / AbC approaches		
Main Partner	33 partners, led by University of Hamburg (UHAM)	**Key results**	Identified key areas that allow biodiversity conservation, maintaining ecosystem services capacity, and restoring degraded ecosystems, while minimising costs. The results suggest that implementing ecosystem-based management restoration measures when designing Green and Blue Infrastructure may result in greater coverage, while improving connectivity across its core and conservation zones. In one single solution, Green and Blue Infrastructure combines in one single solution an ecosystem-based management outcome that balances conservation, restoration and exploitation objectives. The Green and Blue Infrastructure multi-zoning approach offers co-benefits in terms of ecosystem and biodiversity conservation as well as human well-being, while minimising the potential conflicts between conservation and exploitation goals.
Resources	https://www.futuremares.eu/regions-storylines		
Budget	8 555 905 €		

FISHMPABLUE2/ FISHMPABLUE2+				CATEGORY OF ACTIONS: 1, 2, 3, 4
Countries	Spain, France, Italy, Slovenia, Croatia and Greece	**Goal/ objectives**	The overarching vision of this project was to maintain biodiversity and natural ecosystems while increasing sustainability (also socio-economic) of small-scale fisheries, through better managed and connected MPAs and more involved fishers. **Overall goal :** ● To increase the capacities of Mediterranean MPAs to sustainably govern small scale fisheries **Objective :** ● To test the "Governance toolkit for small scale fishery" in different typologies of MPAs, in order to have an upgraded version of it (WP3) ● To disseminate the tested toolkit among the maximum feasible number of Med MPAs (WP4) ● To enhance integration of principles and recommendations in national and international policies to ease informal/formal engagement of stakeholders in small scale fishery management within MPAs	
Duration	Nov 2016 to Nov 2019 (36 months) / June 2021 - 2022			
NbS concepts	Increasing connectivity of MPAs EbM			
Main Partner	8 partners, led by Federparchi (Italy)	**Key results**	Developed a governance Toolkit for managing SSF in Med MPAs (inc. 12 tools, tested in 11 MPAs), addressing five main areas of action: Involvement in decision making, strengthening enforcement, knowledge and ownership, improvement of SSF sustainability and improvement of SSF profitability. Conducted a study on 32 MPAs from 5 Med countries that sorted out the 5 components for a successful governance system of SSF: 1. MPA enforcement; 2. Fisher engagement in MPA activities; 3. and in MPA Board; 4. Incentives for sustainable fishing; 5. management plan. Provided recommendations for international policy makers for a sustainable SSF in the Mediterranean basin	
Resources	https://fishmpablue-2.interreg-med.eu/			
Budget	3 500 000 €			

MPA Networks				CATEGORY OF ACTIONS: 1, 2, 3, 4
Countries	France, Spain, Italy, Albania, Greece, Slovenia, Croatia	**Goal/ objectives**	The MPA NETWORKS project aims at improving marine biodiversity protection by strengthening MPA effective management through networking activities at different levels, and by testing and capitalising solutions, transferring knowledge and building capacities. It will focus on providing sustainable solutions to challenges requiring an approach that goes beyond MPA boundaries. These challenges include the global question of management effectiveness, and more specifically the management of Small scale fisheries in MPAs, the conservation of mobile species and the development of sustainable financing mechanisms for MPAs.	
Duration	Nov 2019 to Apr 2022 (32 months)			
NbS concepts	Increasing connectivity of MPAs EbM EbA			
Main Partner	10 partners	**Key results**	MPA Networks has worked to strengthen networks of professionals dedicated to improving our adaptation to climate change, artisanal fisheries management, mobile species conservation, management effectiveness and sustainable financing of MPAs. Main achievements: • Nine MPA pilot sites, allowing better management and reduction of threats to marine biodiversity, based on the results of previous EU projects. • MPA management capacities in the Mediterranean strengthened through active networking, knowledge sharing and capacity building on key topics. • The networks of MPA managers strengthened and connected at different geographical scales (national, supranational and Mediterranean). • The resources needed for effective MPA management provided in the post-2020 framework and better integrated by decision-makers at different levels.	
Resources	https://mpa-networks.interreg-med.eu/our-story/why-how/			
Budget	2 664 000 €			

Sustainable management of Morocco’s marine resources

CATEGORY OF ACTIONS			
1	2	3	4

<table>
<tr><td>Countries</td><td>Morocco</td><td rowspan="3">Goal/ objectives</td><td rowspan="3">Responsible fishing emerged within the protected marine area of Al Hoceima National Park (ZMPNAH).
Eradicated copper sulphate and dynamite fishing, resulting in a significant reduction in the disturbance of osprey nests and the doubling of the number of Osprey chicks leaving the nest.
Eradicated illegal trawling inside the ZMPNAH.
A new law established in 2013/2014, obliging trawlers to fit devices with Vessel Monitoring Systems (VMS) geolocation as a result of the awareness campaigns used against the fishing of juveniles
An increase in the abundance of marine resources, estimated at 20 to 30% depending on the species and ecosystems
A 30% poverty reduction for approximately 1,200 artisanal fishermen.
Assurance of the project’s financial viability, through participatory planning and the use of a sustainable marketing strategy for fish products emanating from the project’s area of application.</td></tr>
<tr><td>Duration</td><td>2014-2019</td></tr>
<tr><td>NbS concepts</td><td>EbA, Community-based ecosystem management, MPA</td></tr>
<tr><td>Main Partner</td><td>Project led by the Association of Integrated Resource Management (AGIR)</td><td rowspan="3">Key results</td><td rowspan="3">The project implemented a broad programme of participatory planning following an ecosystem approach, for the benefit of 3,000 artisanal fishermen operating in the Moroccan Mediterranean and in the aforementioned areas.
The sustainable management put in place to manage marine resources is a clear example of Nature-based Solutions dealing with food security and disaster risk reduction linked to the potential collapse of fisheries as a consequence of the marine ecosystem mismanagement.</td></tr>
<tr><td>Resources</td><td>https://panorama.solutions/en/solution/sustainable-management-moroccos-marine-resources</td></tr>
<tr><td>Budget</td><td></td></tr>
</table>

Adaptation of the Camargue's former saltworks to climate change				CATEGORY OF ACTIONS: 1 2 3 4
Countries	France	**Goal/ objectives**	The main objective is to restore natural hydrological processes by reconnecting lagoons within the site and with the surrounding aquatic ecosystem and the sea. Specific management objectives are to: • Restore more natural hydrological functioning. • Restore the natural ecosystem characteristics of coastal lagoons and sandy coastlines. • Maintain or increase the carrying capacity for breeding colonial waterbirds. • Implement adaptive management in response to sea level-rise, including controlled coastal retreat in areas affected by erosion. • Contribute to sustainable development, including facilitating the development of green tourism and recreational activities.	
Duration	2011-ongoing			
NbS concepts	Adaptation to climate change using: (EbA),Eco-DRR)			
Main Partner	Conservatoire du littoral, Parc naturel régional de Camargue, Tour du Valat, Société nationale de protection de la nature	**Key results**	• Improve the state of conservation of a significant portion of the region's coastal ecosystems. Beaches are being restored along 4 Km of coastline where this ecosystem had previously completely disappeared because coastal defence infrastructures were impeding the natural retreat of the coastline. This innovative strategy avoids the maintenance and reinforcement of grey infrastructures located along the coastline (investment estimated at c. 30 millions €) but foresees the adaptation of the inner dike (estimated at c. 10 millions €). • Eliminate the ecological impacts related to rock quarry operations and rock transport from the mining area to the saltwork coast. • Restore the former saltworks and generate social benefits such as protection against climate change, the production of scientific knowledge, recreation and tourism opportunities and inspiration for art and design. • Fisheries in the surrounding wetlands benefit from the lagoon restoration process as hydrobiological connections and fish migration between the sea. • Restore the former salt pans and the surrounding wetlands.	
Resources	https://tourduvalat.org/en/newsletter-articles/the-restoration-of-the-former-saltworks-in-the-camargue-a-nature-based-solution-to-adapt-to-sea-level-rise/			
Budget	7 to 13 million €, plus 80 000 € to 140 000 € for annual maintenance 1.5 million € for hydraulic reconnection works			

TUNE UP

CATEGORY OF ACTIONS: 1 | 2 | 3 | 4

Countries	France, Spain, Italy, Greece, Montenegro, Albania, Slovenia	**Goal/ objectives**	The main objective is to tackle the need for a strategic and collaborative approach to Med MPAs management and biodiversity protection, by testing and capitalising a multi-stakeholder/multi-level governance tool based on River/Wetland Contracts experience tested by the INTERREG MED WETNET project. The TUNE UP approach is based on vertical and horizontal subsidiarity in order to achieve effective coordination among institutions at all involved levels by integrating funding, planning tools and human resources while limiting raising conflicts between preservation and economic issues. The core idea is to exploit the feasibility and flexibility of the Environmental Contract methodology in MPAs management with the main goal of biodiversity conservation.
Duration	From November 2019 to June 2022 (32 months)		
NbS concepts	EbA/ EbM		
Main Partner	12 partners lead by ANATOLIKI SA (Greece)	**Key results**	Main achievements: • The Local Environmental Contracts were tested in 10 pilot MPA in 7 countries around the Mediterranean Sea. • Actions at local and regional scale aiming to further promote the Methodology of Environmental Contracts in Marine Protected Areas were among the main outputs of the project. • Identification of governance and stakeholder engagement challenges to Environmental Contracts procedures and design as well and their integration at Regional Policy level, emerged as particularly important, in the framework of the Tune Up project.
Resources	https://tune-up.interreg-med.eu/		
Budget	3 000 000 €		

WETNET				CATEGORY OF ACTIONS: 1 2 3 4
Countries	Slovenia, France, Malta, Portugal, Italy and Spain	**Goal/ objectives**	WETNET tackled the issue of implementing multilevel governance for Mediterranean wetlands in order to achieve an overall and network effect on wetland ecosystems, as well as on connected local systems. By defining common priorities for Mediterranean wetlands conservation, WETNET built a common territorial strategy for their integrated management.	
Duration	Nov 2016 to Apr 2019 (30 months)			
NbS concepts	EbM / AbC			
Main Partner	9 partners, led by Veneto Region	**Key results**	Improved governance - based on a more transparent and inclusive governance model that goes beyond the previous excessively separate governance schemes. • Empowerment of the local community - through the creation of new channels for the exchange of knowledge and the preparation of concrete actions. • A new common vision of the future scenario trend was shared. • Greater awareness of local stakeholders on the fragility of the wetland system and pressures on ecosystems. • Empowerment of local stakeholders to monitor and preserve the quality of the wetland; • Greater awareness of decision-makers on the importance and effectiveness of the governance process. • Wetland Contract of the Caorle Lagoon System - adapted to the Italian national legislation in the form of a negotiated agreement. Digital signing phase started on October 30th, 2019. • Program of actions (Action Plan) - based on a shared vision and operational objectives to improve governance related to the management of water resources, outlining the responsibilities for the implementation of actions aimed at protecting the environment, economic development and governance. It includes 55 actions.	
Resources	https://wetnet.interreg-med.eu/			
Budget	2 520 000 €			

LIFE EBRO - ADMICLIM

CATEGORY OF ACTIONS			
1	2	3	4

Countries	Spain	**Goal/ objectives**	The project LIFE EBRO-ADMICLIM (ENV/ES/001182) put forward pilot actions for climate change adaptation and mitigation in the Ebro Delta (Catalonia, Spain), an area vulnerable to sea level rise and subsidence. It proposed an integrated management of water, sediments and habitats (rice fields and wetlands) with the following multiple objectives to: • Optimise increases in land elevation • Reduce coastal erosion • Increase the accumulation (sequestering) of carbon in the soil • Reduce greenhouse gas (GHG) emissions • improve water quality
Duration	Jun 2014 to May 2018 (48 months)		
NbS concepts	EbM / EbA / Ecosystem-based Mitigation / Climate Adaptation Services		
Main Partner	7 partners, led by Institute of Food and Agriculture Research and Technology (IRTA)	**Key results**	• Optimization of the functioning of the constructed/artificial wetlands (green filters) in order to maximise the rate of carbon sequestration (action B3). • Accurate evaluation of the carbon stock and accretion rates in the fields where the GHG emission experiments are carried out (action B4). • Evaluated the impact on birdlife of changing water management practices during the post-harvest period and its relationship to GHG emissions (action B5). • Evaluated accurately the subsidence affecting the Delta and determine which areas are most vulnerable to a relative rise in sea level (action B6). • Drew up a Climate Action Plan for the Ebro Delta (action B7) with specific and effective measures of adaptation and mitigation for climate change, establishing the directives and actions to be carried out following the finalisation of the project.
Resources	http://www.lifeebroadmiclim.eu/		
Budget	2 260 960 €		

Wetland Based Solutions Project			CATEGORY OF ACTIONS: 1 2 3 4
Countries	Tunisia, Italy, Montenegro & Albania	**Goal/ objectives**	The Wetland-based Solutions project gathers together a powerful network of expert organisations working to conserve and restore Mediterranean wetlands, who pool their expertise and experiences to hone skills, identify successful solutions, raise awareness, and spread best practices across the basin.
Duration	till 2022		
NbS concepts	ER / EbA/EbM/AbC		
Main Partner	15 partners : BirdLife International, Euronatur, IUCN ECARO, IUCN Med, MEDSEA Foundation, Mediterranean Small Islands Initiative (PIM), Tour du Valat, MedWet Initiative, WWF Greece, WWF North Africa, WWF Spain, Wetlands International, Vertigo Lab	**Key results**	An umbrella project: that includes the Saltpans Initiative and MedIsWet – Island wetlands 2 results.
Resources	https://wetlandbasedsolutions.org/		
Budget	14 500 000 € (fully funded - €10.7m: MAVA Foundation; €3.7m: others).		

Overarching activities addressing Wetland Conservation in the Mediterranean Region

CATEGORY OF ACTIONS: 1 | 2 | 3 | 4

Countries	Tunisia, Italy, Montenegro	**Goal/ objectives**	The Project's objectives were to: • Support sharing of best practices and restoration measures applied at the pilot sites and others where appropriate. • Coordinate efforts with other existing saltpan restoration and promotion initiatives. • Create the capacity within the partnership to define a multi-year saltpan recovery project which can be submitted to an external donor during the 2018-2019 period, one which can leverage funds and catalyse further action and cooperation in other Mediterranean priority wetlands/saltpans such as the Gediz Delta (Turkey), Cabo de Gata (Spain) and others. • Support priority Mediterranean wetlands, and especially saltpans, and to develop them as functional natural habitats that support healthy populations of migratory and non-migratory birds in association with responsible economic activities and in a manner that can be replicated throughout the region. • Promote the uptake of best practices through communication actions in the Mediterranean and international targeted advocacy.
Duration	2017 - 2020		
NbS concepts	ER / EbA/EbM/AbC		
Main Partner	BirdLife International	**Key results**	• Identified biodiversity rich and sensitive areas. • Identified environmental impact studies and solutions for mitigating problems. • Developed convincing evidence for the need to take the environment into account in development planning and to communicate this effectively. • Developed the civil society skills and knowledge needed to address wetland conservation issues. • Ensured that traditional resource use and governance of the sites are understood, including access rights. • Raised awareness in local communities and/or farmers about best practices in water management. • Involved relevant stakeholders in decision-making processes. • Implemented effective sustainable development plans. • Supported saltpan restoration actions to improve their functioning and the knowledge about them.
Resources	https://medwet.org/wp-content/uploads/2018/10/saltpans-Initiative-en.pdf		
Budget	513 120 €		

MedIsWet – Island wetlands 2

CATEGORY OF ACTIONS			
1	2	3	4

Countries		**Goal/ objectives**	This joint Mediterranean project aims to replicate the Greek island wetland project to all the islands of the Mediterranean Basin, by establishing a network of NGOs, Institutes, Universities and public authorities. The project's objectives are to: • Complete inventories of all the Mediterranean island wetlands. • Disseminate knowledge and promote certain conservation measures in local, national and Mediterranean scale.
Duration	25 months		
NbS concepts			
Main Partner	WWF Greece (Leader), Terra Cypria, WWF Turkey, Association Hyla, Mediterranean Small Islands Initiative, Nature Trust Malta, MedWet	**Key results**	• This joint Mediterranean project aims to replicate the Greek island wetland project to all the islands of the Mediterranean Basin, by establishing a network of NGOs, Institutes, Universities and public authorities. • The project's objectives are to: • Complete inventories of all the Mediterranean island wetlands. • Disseminate knowledge and promote certain conservation measures in local, national and Mediterranean scale.
Resources	https://sites.google.com/view/mediswet/mediswet-project/about		
Budget	1 097 000 €		

MedIsWet – Island wetlands 2

CATEGORY OF ACTIONS			
1	2	3	4

Countries	Italy	**Goal/ objectives**	An international cooperation project that aimed to define an integrated management model for the coastal wetlands of the Gulf of Oristano by restoring, protecting and connecting the wetlands of the Oristano Gulf in an integrated system of governance and sustainable development. The first goal was to establish an effective governance of the territory, which boasts six Ramsar Sites in 7,700 hectares of wetlands in the Gulf of Oristano. To do this, a Local Consultation Group (LCG) composed of 13 municipalities, the Province of Oristano, and the Sardinia Regional Administration, was established. The projects 8 objectives were to: • Improve knowledge of wetlands. • Achieve integrated coastal wetlands management. -reducing threats on marine ecosystems. • Promote efficient water resource management and use. -reducing the risk from pollution sources. • Improve the conservation of endangered species and habitats. • Enhance cultural and landscape heritage. • Raise awareness on the importance of wetlands.
Duration	2017-2020 (still ongoing)		
NbS concepts	ER / EbA/EbM/AbC, (Eco-DRR)		
Main Partner	MEDSEA Foundation coordinates the activities of all the stakeholders involved in the Maristanis project	**Key results**	• The Oristano Coastal Wetlands Contract signed. The Contract is a voluntary act of shared commitment to improve the protection and implement an integrated management of the wetlands of the Gulf of Oristano (Ramsar and Natura 2000 sites). The Contract was signed on the 5th of February 2021 by 11 local municipalities plus province and regional authorities. • The Contract action program includes: Participatory territorial governance and capacity building; Improvement of the ecological status of water systems; Protection of biodiversity and natural heritage; Landscape requalification and enhancement of cultural heritage; Green economy - towards a sustainable and responsible territorial development model; Strengthening resilience by addressing climate change; Communication and environmental awareness. • Identified biodiversity rich and sensitive areas. • Established relative vulnerability and risk maps that allowed the prioritisation of “hotspots” and coastal ecosystems more at risk to climate-related impacts. • Evaluated ecosystem services, including traditional uses. Designed an Integrated Information System to monitor wetland resources with a uniform data management. • Created the Oristano Wetland Observatory to guarantee a continuous monitoring of the Oristano wetlands.
Resources	http://www.maristanis.org/		
Budget	4 637 499 €		

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