



Mediterranean Biodiversity Protection tools catalogue

Streamlining management
efforts in protected areas for
better nature conservation in
the Mediterranean

Biodiversity Protection Tools Catalogue

Illustrations by Yorgos Konstantinou

ACT4LITTER - AMARE - CONFISH - ECOSUSTAIN- FISHMPABLUE2 - MEDSEALITTER - MPA-ADAPT - PANACeA - PHAROS4MPAS - PLASTICBUSTERS - POSBEMED - WETNET

The project PANACeA

The objective of the project “PANACeA: Streamlining Management Efforts in Protected Areas for an Enhanced Nature Conservation in the Mediterranean Sea” is to streamline networking and management efforts in Mediterranean Marine Protected Areas (MPAs) as a mechanism to enhance nature conservation and protection in the region.

The project aims at building a community of nature conservation stakeholders, including managers, policy-makers, socio-economic actors, civil society, and the scientific community, actively working to protect biodiversity and natural ecosystems in Mediterranean MPAs. The initiative undertakes actions to increase the visibility and impacts of the results of different thematic biodiversity protection projects that are being undertaken by members of its Community, also with the financial support Interreg MED programme, reaching a common and pre-identified strategic target audience.

Several policy aspects are addressed under the umbrella of these thematic projects, covering biodiversity protection, sustainable use of natural resources, ecosystem-based management approaches - including Maritime Spatial Planning (MSP) and Integrated Coastal Zone Management (ICZM) - as well as governance mechanisms. The Community is working to advance more effective biodiversity protection in the Mediterranean through enhanced monitoring and management of coastal and marine ecosystems, specifically targeting more sustainable fisheries, better adaptation to climate change effects, better prevention of marine litter and improved waste management.

The Biodiversity Protection Tools Catalogue

In the framework of the Project PANACeA, the MED Biodiversity Protection Community built the present Catalogue of tools for biodiversity protection in Mediterranean MPAs, covering different needs and requirements for ecosystem-based management.

This Catalogue is an update and extension of a previous report¹ developed in the context of PANACeA, which includes a preliminary version of some of the tools for ecosystem-based management in the Mediterranean, being developed by the Biodiversity Protection Community projects during the year 2018.

¹ The report “Tools for Ecosystem-Based Management - Tools presented during the MED Biodiversity Protection Community Interactive Session” is available here. <http://panaceaweb.adabyron.uma.es/download/66/panacea/658/tools-for-ecosystem-based-management.pdf>

“ The tools included
in this Catalogue are
classified into three
types: monitoring tools;
management tools; and
geospatial tools. ”

“These tools support a shared management of ecosystems based on promoting science and participatory approaches”



photo by: Bruno Glätsch from Pixabay

The tools included in this Catalogue are classified into three types: monitoring tools; management tools; and geospatial tools. Monitoring tools have been developed to support the data collection and monitoring of specific ecological and socio-economic aspects, such as marine litter presence and distribution, and physico-chemical parameters associated with water quality and climate change. Management tools aim to support MPA managers in regulating specific sectors (e.g. small-scale fisheries), ecosystems (e.g. wetlands), or issues (e.g. marine litter, beach management), or in supporting an increased coordination with other maritime socio-economic sectors in the context of the Blue Economy and the Marine Spatial Planning.

Finally, geospatial tools have been developed to foster the access and sharing of spatial data and information, which are essential not only to support the informed management of Mediterranean MPAs, but also to generate new knowledge on ecological and natural resource management aspects, to support sustainable growth in Mediterranean protected areas and beyond.

Overall, each of these tools is specially targeted to satisfy the specific needs and requirements of an ecosystem-based management, in line with the aim and the activities of the Mediterranean Biodiversity Protection Community featured by PANACeA. They may be adopted and implemented by a

wide range of stakeholders, including MPA managers, local authorities, citizens, researchers, and a diverse range of stakeholders (e.g., fishermen, hunters, business sector).

The information provided for each tool includes:

- General information on the target groups of the tool, the theme addressed, the type of tool, the pilot areas where the tools has been, or is planning to be, applied, and a list of five keywords to easily find the tool;
- The main problem that the tool aims to solve;
- The main requirements for the implementation of the tool, in relation to technological infrastructure, training, and investment;
- A brief description on how to use the tool, and the recommended timeline of implementation;
- The main challenges that may arise during the implementation of the tool, and suggestions on how to address them;
- A brief description of the main quantitative results of the tool, and the potential of transfer of this tool into other areas;
- Key numbers that illustrate the need to implement the tool, or its efficiency/effectiveness; and
- Project and pilot areas contacts, including links of interest to platform pages, project results, detailed reports, or any other useful material for further information on the tool.

For further information

Project contact: PANACeA

- Dania Abdul Malak, ETC-UMA

Links of interest:

- [Biodiversity Protection Knowledge Platform](#)
- [Factsheet - Biodiversity Protection Knowledge Platform](#)
- [The Interreg MED Biodiversity Protection Community - A Mediterranean partnership for nature protection](#)
- [Video tutorials](#)



- <https://biodiversity-protection.interreg-med.eu>
- <https://www.facebook.com/PanaceaInterregMed>
- [@MEDCommunity3_2](#)
- panacea-med@uma.es
- <https://www.linkedin.com/groups/13511318/>

This tool is part of a Mediterranean Toolkit for Biodiversity Protection developed by the PANACeA partnership:





Marine Litter Watch Month

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To whom is it addressed?

Marine Protected Area (MPA) managers, environmental NGOs, local authorities, educators, and students

Theme

Marine Litter

Type of tool

Monitoring tool

Key words

Marine litter, participatory-science, beach surveys

Pilot areas



1. What problems would this tool solve?

Marine litter is building up in Mediterranean coastal and marine protected areas. The ACT4LITTER Marine Litter Watch Month (MLWM) aims to gather essential data about the amount, composition, types and sources of marine litter on beaches by engaging MPA managers and other actors in a participatory-science campaign. The ACT4LITTER MLWM may not only provide fit-for-purpose data for the effective management of marine litter in Mediterranean coastal and marine protected areas, but may also enhance managers' skills on how to monitor marine litter by using a standardised beach litter monitoring protocol.

2. What is needed for its implementation?

Technological infrastructure

A hand-held GPS tracker to record the exact location of the survey sites, and a camera to document the physical characteristics of the monitoring sites.

Training

Capacity building, including hands-on training activities, are essential in order to enhance the target groups' skills on how to monitor marine litter on beaches in a harmonised way, in accordance with the EU "Guidance on Monitoring of Marine Litter in European Seas".

Investment

The application of beach litter monitoring is not demanding when it comes to financial and human resources. Assuming that four operators are required for each transect surveillance and about 3-4 hours on average are needed to collect, classify and record the items, about 4-6 man-days per year are needed to monitor one survey site. Assuming that results are reported to the European Environment Agency Marine Litter Watch or the EMODNET platforms, no additional resources are needed to process the results. However, the preparation of MPA-specific marine litter assessment reports requires additional resources for

gathering, validating, and processing the datasets in order to compile an assessment report.

3. How to use it?

Concept

Survey sites are selected following the criteria described by the EU “Guidance on Monitoring of Marine Litter in European Seas”. All litter items larger than 2.5 cm are collected, counted, and categorised in accordance with the ‘Marine Strategy Framework Directive (MSFD) TG10 Master List of Categories of Litter Items’. The macro-litter density, expressed in number of items per square metre and number of items per 100-metre stretch, is calculated. The sources of marine litter are determined using the attribution-by-litter type method, which attributes specific items to a certain source, assuming that these are typically used by specific sectors, or are released into the environment via well-defined pathways.

Recommended implementation frequency

The MLWM campaign should be performed in every season, i.e. in winter (mid-December to mid-January), spring (April), summer (mid-June to mid-July), and autumn (mid-September to mid-October) of each year.

4. What challenges may arise?

MPA managers may have problems initially performing data collection and monitoring activities, due to a lack of experience or expertise. A possible solution to this problem lies in the provision of additional technical support in following the methodology and the standardised protocol provided.

5. What are the expected results?

Quantitative results

Reliable, accurate, and comparable fit-for-purpose data that enhance our knowledge of the amounts, types, composition, and sources of marine litter found on beaches in Mediterranean MPAs.

Transfer potential

The MLWM can be quite easily set up and run in diverse settings, enabling the participation of a wide range of actors such as MPA managers, NGOs, local authorities, and the educational community. Not only does it have the potential to engage MPA managers and other actors in gathering essential data on marine litter throughout the Mediterranean, but it can also act as a vehicle for raising awareness on marine litter and its sources, impacts, and solutions.

Key information

- During the winter edition of the MLWM, performed in December 2017-January 2018 in 16 coastal and marine protected areas of Albania, France, Greece, Italy, Slovenia, Spain and Turkey, a total of 17,334 marine litter items were recorded, with an average litter density of 1,048 items per 100-m stretch and 0.6 items per square metre. More than one-fourth of the 22 beaches surveyed were characterised by high litter densities ranging from 681 to 12,896 items per 100-m stretch.
- Main types of litter – 82% artificial polymer materials, mainly small plastic and polystyrene pieces (21.9%). On aggregate, single-use plastics accounted for about one-fifth (21%) of all the items recorded.
- Litter from shoreline sources, such as tourism and recreational activities and poor waste management practices accounted for 26.5% of all litter collected, while the amount of litter from fisheries and aquaculture was in the range of about 10%.

For further information

Project contact

- Thomais Vlachogianni, MIO-ECSDE Programme Officer, MLWM Leader
- Ignasi Mateo, ARC-SCP/RAC
- MedPAN

Links of interest

- [Marine Litter Watch Month](#)
- [Snapshot Assessment of Marine Litter found on Mediterranean beaches](#)
- [EU Guidance on Monitoring Marine Litter in European seas](#)
- [VIDEO: Guidelines on how to monitor marine litter on beaches](#)
- [Biodiversity Protection Knowledge Platform – Act4Litter project viewer](#)
- [Biodiversity Protection Knowledge Platform – Marine Litter resources](#)
- [Factsheet on Modular Projects on Biodiversity Protection](#)



This tool is part of a Mediterranean Toolkit for Biodiversity Protection developed by the PANACeA partnership:





Marine Litter MPA Action Plans

Photo by: M.Cebolla, Arxiu PNDE

To whom is it addressed?

Marine Protected Area (MPA) managers

Theme

Marine Litter

Type of tool

Management tool

Key words

Marine litter, management plan, MPA

Pilot areas



1. What problems would this tool solve?

The Mediterranean Sea is one of the areas most affected by marine litter worldwide, threatening habitats and species even in pristine coastal and marine environments. MPA managers lack the tools, knowledge, and often the resources to effectively tackle this problem. The purpose of the Marine Litter MPA Action Plans is to support MPA managers in identifying, selecting, and implementing targeted actions to tackle marine litter within the borders of their MPAs, and facilitate their efforts in achieving their conservation goals.

2. What is needed for its implementation?

Technological infrastructure

No particular technological infrastructure is needed; only a PC and an internet connection are required to run the decision-making tool, an innovative system that helps MPA managers to identify the most effective and feasible marine litter measures for their specific context.

Training

The action plans were developed step-by-step, engaging all stakeholders/actors of the area with the aim to reflect

the MPA-specific context and characteristics and define the priority measures for preventing and mitigating marine litter effectively. The action plans can be prepared using a quick guide that has been developed for MPA managers.

Investment

It is not easy to estimate the financial resources needed to develop an action plan, as these depend on the specifics of the MPA and the comprehensiveness of the envisaged action plan.

3. How to use it?

Concept

The key objectives of an MPA-specific Marine Litter MPA Action Plan are to:

- I. Prevent and reduce marine litter entering the coastal and marine environment of Mediterranean MPAs.
- II. Collect and remove marine litter from the coastal and marine environment of Mediterranean MPAs by using sound methods that do not pose any threats to habitats and species, with a specific focus on marine litter hotspots and accumulation areas.

- III. Enhance and deepen our knowledge of the marine litter threat (amounts, composition, sources, pathways and impacts) in Mediterranean MPAs.

The development of the Action Plan should be articulated in 4 phases:

1. Establishment: identification and engagement of stakeholders; establishment of a core team with the mandate to prepare and implement the plan.
2. Analysis and Scenarios: collection of all available information on marine litter, possibly also using the Marine Litter Watch Month (MLWM) tool; initiation of stakeholder engagement; generation of a proposed set of measures for marine litter prevention and mitigation. These measures may be identified via the use of an online decision-making tool, which can facilitate the shortlisting of priority measures by matching the MPA-specific content and its marine litter specifics with the features of a comprehensive list of about 100 showcases of best-practice marine litter measures.
3. Setting the Vision: engagement of stakeholders and the wider community in discussing the findings and building consensus on the final set of measures to be included in the plan.
4. Designing the Future: drafting and adoption of the marine litter Action Plan, which should indicatively include: i) the goals and objectives of the plan, ii) a preamble explaining the scope and process followed for its production and approval, iii) the context derived from the analysis, iv) the governance structure, v) the institutional framework for

implementation, and vi) the priority marine litter measures agreed upon by the different stakeholders, along with a roadmap for their implementation.

Recommended implementation frequency

A timeframe for implementing each measure included in the Action Plan should be provided.

4. What challenges may arise?

The challenges that may arise in the implementation of the Action Plan can be related to aspects such as the lack of relevant data, difficulties establishing effective collaborations with local actors, and the lack of financial resources.

5. What are the expected results?

Quantitative results

The expected result is to develop a Marine Litter Action Plan, including a set of agreed measures to curb marine litter in the MPA.

Transfer potential

Action plans for marine litter may be developed and adopted by all Mediterranean MPAs, following the example set by the 9 pilot MPAs, and building upon the ACT4LITTER Joint Plan for Action entitled “Top 10 Priority Actions to curb marine litter in Mediterranean Marine Protected Areas”. In this way, coordinated approaches and actions can be established on a Mediterranean scale towards tackling marine litter in MPAs, and achieving the conservation objectives set.

Key information

- Possible measures to be included in the Action Plan are: i) setting up adopt-a-beach schemes; ii) establishing passive fishing-for-litter schemes; iii) carrying out clean-up and removal actions; iv) carrying out awareness and educational campaigns; v) promoting bans or levies on single-use items; vi) setting up selected waste reduction measures; vii) improving waste management; viii) promoting extended producer responsibility schemes; ix) and carrying out participatory-science initiatives to collect marine litter data.
- The decision-making tool is an innovative system that provides essential support to MPA managers who want to address marine litter. The decision-making tool was created in close collaboration with MPA managers and marine litter experts, building upon the ACT4LITTER list of some 100 showcases of best practice marine litter measures. The tool gathers information from users by asking questions, it matches this information with the criteria of the mapped best practice marine litter measures and comes up with a short list of measures that are relevant to the MPA special needs.

For further information

Project contact

- Ignasi Mateo, SCP/RAC
- Thomais Vlachogianni, MIO-ECSDE
- Sant’Anna School of Advanced Studies

Links of interest

- [Quick Guide for MPA managers on setting the Action Plan](#)
- [Deliverables page with links to the 9 pilot Action Plans](#)
- [Decision-Making Tool \(DMT\)](#)
- [List of showcases of measures to tackle Marine Litter in MPAs](#)
- [Biodiversity Protection Knowledge Platform – Act4Litter project viewer](#)
- [Biodiversity Protection Knowledge Platform – Marine Litter resources](#)
- [Top 10 Priority Actions to curb marine litter in Mediterranean marine protected areas](#)



This tool is part of a Mediterranean Toolkit for Biodiversity Protection developed by the PANACeA partnership:





Biodiversity Protection Knowledge Platform

biodiversity.uma.es

To whom is it addressed?

Marine Protected Area (MPA) managers, researchers, public authorities, funding programmes, conservationists

Theme

Ecosystem approach

Type of tool

Geospatial Tool

Key words

Biodiversity, protected areas, policy, ecosystem approach, environmental data, Mediterranean

Pilot areas: Interreg MED Biodiversity Protection Horizontal project PANACeA partner institutions 2016-2019



1. What problems would this tool solve?

The objective of the Biodiversity Protection Knowledge Platform is to give visibility to effective methodologies, key project results, and actions towards biodiversity protection performed in the context of the Interreg MED funded Biodiversity Protection Community of projects, as well as to Interreg MED projects and partners. This platform provides a gateway to the spatial data generated by the Interreg MED Biodiversity Protection Community, and a knowledge reference (enriched with relevant external sources) on protected areas, ecoregions, and pressures to support regional environmental policy on biodiversity protection, natural resource management, and sustainable growth in Mediterranean protected areas and beyond.

2. What is needed for its implementation?

Technological infrastructure

A PC/tablet, an Internet browser (Firefox and Google Chrome recommended) and an internet connection are required to access the Biodiversity Protection Knowledge Platform.

Training

No particular training is necessary to access and use the Platform, only basic knowledge as an Internet user. Video tutorials and a guidance document for users are included in the platform.

Investment

No costs are associated with accessing and using the Platform.

3. How to use it?

Concept

The Biodiversity Protection Knowledge Platform has a visual interface giving access to the main components:

- A Library, providing access to relevant project results, products, and available documentation; and
- The geoportal (or map viewer), which can be used to display biodiversity spatial data, and which consists of two main elements:
 1. A map viewer, where geospatial data can be displayed and individual queries can be performed; and
 2. A Catalogue viewer, allowing the user to navigate and discover available geospatial data, through a search engine and filtering tools.

The geoportal allows users to select and combine various data layers, to display and export ad hoc maps, and generate additional knowledge and policy-support. The infrastructure supports the principles of INSPIRE, SEIS, and GEOSS. The Platform uses Metadata standards (such as ISO 19119/115), existing thesauri to choose descriptive keywords (GEMET / INSPIRE / KEEP), and a clear and sound data policy to ensure data ownership and observe OGC web standards (WMS, WFS, WMTS, etc.).

Recommended implementation frequency

The Biodiversity Protection Knowledge Platform is already online at biodiversity.uma.es and can be consulted at any time. Periodic updates will be implemented to integrate relevant external spatial data on biodiversity, update the MedBioLitter database on interactions between biodiversity and litter, and add new materials to the library of resources on project results.

Key information

The Knowledge Platform showcases the results of 12 Interreg MED projects, involving more than 185 Mediterranean partners.

4. What challenges may arise?

The complexity and diversity of data inputs may require additional effort to find a dedicated solution to better represent specific results. The quality and accuracy of the results and messages output, extracted through the viewer interface, are strictly related to the quality and standardisation of the data input.

5. What are the expected results?

Quantitative results

The Platform's map viewer is developed to spatially represent data and information generated by the projects of the Community. The Platform will work in synergy with MED's website, with a strong focus on spatial data and on ensuring service interoperability and integration. Relevant, external data sources include T-MEDNET, Med-IAMER, AWI, and VLIZ, among others.

Transfer potential

The Biodiversity Protection Knowledge Platform can be easily accessed by anyone interested in the themes of biodiversity protection and the implementation of an ecosystem approach to the Mediterranean. Further connections may be developed to ensure a wider spatial, temporal, and thematic coverage of the data.



For further information

Project contact: PANACeA

- Emanuele Mancosu, ETC-UMA

Links of interest:

- [Biodiversity Protection Knowledge Platform](http://biodiversity-protection.interreg-med.eu)
- [Factsheet - Biodiversity Protection Knowledge Platform](https://www.facebook.com/PanaceaInterregMed)
- [The Interreg MED Biodiversity Protection - A Mediterranean partnership for nature protection Community](https://www.facebook.com/PanaceaInterregMed)
- [Video tutorials](https://www.facebook.com/PanaceaInterregMed)



- <https://biodiversity-protection.interreg-med.eu>
- <https://www.facebook.com/PanaceaInterregMed>
- [@MEDCommunity3_2](https://twitter.com/MEDCommunity3_2)
- panacea-med@uma.es
- <https://www.linkedin.com/groups/13511318/>

This tool is part of a Mediterranean Toolkit for Biodiversity Protection developed by the PANACeA partnership:





Monitoring Protocol for Floating and Ingested Marine Litter

Photo by: Asunción Borrell

To whom is it addressed?

Scientists, technicians, Marine protected area (MPA) managers

Theme

Marine Litter

Type of tool

Monitoring tool

Key words

Marine litter, monitoring, protocol

Pilot areas: Capo Carbonara MPA, Italy; Barcelona–Civitavecchia transect; Livorno–Bastia transect; Palermo–Cagliari transect; Palermo–Tunis transect; Ancona–Igoumenitsa–Patras transect



1. What problems would this tool solve?

Currently available data on marine litter in the Mediterranean and in Europe are often insufficient and not comparable across marine regions and surveys. More consistent, coherent, and comparable marine litter data are needed in order to increase our knowledge, implement concrete actions for marine protection, and monitor their effectiveness. To address this issue, two protocols have been developed in the context of the Interreg MED MedSeaLitter project to provide a standard way to collect data on floating marine litter and on marine litter ingestion by sea turtles (*Caretta caretta*), fishes (recommended species: bogue, Boops boops), and polychaeta.

2. What is needed for its implementation?

Technological infrastructure

The technical requirements to apply the protocol are higher in the case of the use of aircrafts and drones, and for the ingestion of micro-litter in biota, while they are lower for the

visual observations from ferries and small-medium boats, and for the ingestion of macro-litter in sea turtles. A detailed description of the technological infrastructure required for each tool is included in the published protocol.

Training

The training and expertise required depend on the technique used (see the published protocol for detailed specifications). Specialised training and expertise are necessary to use aircrafts and drones, and to apply the methods related to the extraction of ingested litter, while the use of ferries or small-medium boats for visual observations has lower training requirements. Specific training for pilot MPAs has been organised in the context of MedSeaLitter in spring and summer 2019.

Investment

Approximate estimations of the cost of each technique in the protocols have been performed; they are included in the published protocol. These range from the lower cost

of visual observations by ferries (in the 1,000-50,000 Euro range) to the higher cost of using aircrafts and monitoring micro-litter ingestion by invertebrates (higher than 50,000 Euro). The exact cost will depend on staff costs, existing equipment, and whether or not the protocol makes use of existing monitoring programmes and/or maritime operations.

3. How to use it?

Concept

The protocol proposes slight modifications to the basic data collection sheet adopted at the European level. Recommendations are also made on using ferries and sailing boats, and on using automatic photography from UAVs and manned aircrafts. In relation to the ingestion of marine litter, the protocol focuses on the loggerhead sea turtle (*Caretta caretta*), fishes (recommended species: bogue, Boops boops), and polychaeta. In relation to the loggerhead sea turtle, the protocol addresses only the necropsy in dead animals, slightly modifying the existing European protocol, considering basic and optional parameters proposed to stakeholders according to their logistics and time constraints, and in coordination with another EU-funded project, INDICIT.

Recommended implementation frequency

Seasonality can play a key role in driving the variability in the amount and distribution of litter, which is linked to seasonal variation in oceanographic and anthropogenic factors. Thus, stratification of surveys for the different seasons is required. For floating marine litter, a minimum sampling frequency of one per year is required, although

seasonal replication is recommended. A frequency of at least 5 surveys per season can be considered adequate to perform seasonal analyses within one year of monitoring.

4. What challenges may arise?

Visual observations and automatic recording through photo/video may be affected by weather/sea conditions. Costs may be high if using dedicated research vessels. Moreover, from large vessels and aircraft it is possible to detect only marine litter that is larger than 20 cm. Finally, the dimension of the objects at sea may be difficult to assess; to overcome this issue, the protocol suggests using a ruler with a string of fixed length, and measuring the apparent length of the object and the degree of distance from the horizon line, in order to have an estimation of the object's real size. The monitoring of ingestion may depend on the geographic coverage of the species and the availability of animals.

5. What are the expected results?

Quantitative results

The application of the protocol allows for the collection of consistent, coherent, and comparable data on floating marine litter on both a large scale (i.e., at the Mediterranean basin level) and local scale (i.e., at an MPA level), and on ingested litter by biota.

Transfer potential

The protocol has been specifically developed for the Mediterranean, but it may be used to collect marine litter data in other marine contexts as well.

Key information

- The protocol developed by MedSeaLitter has been included in the review of the EU Guidance on Monitoring of Marine Litter in European Seas, in 2019.

For further information

Project contact: MEDSEALITTER

- Antonella Arcangeli, ISPRA
- Morgana Vighi, University of Barcelona

Links of interest:

- [MedSeaLitter Final Shared Monitoring Protocol](#)
- [Comprehensive Framework on Existing Marine Litter Monitoring Practices](#)
- [Biodiversity protection Knowledge Platform – MedSeaLitter project viewer](#)
- [Biodiversity Protection Knowledge Platform – Marine Litter resources](#)
- [Campana et al. \(2018\). Seasonal patterns of floating macro-litter across the Western Mediterranean Sea: a potential threat for cetacean species](#)
- [Arcangeli et al. \(2018\). Amount, composition, and spatial distribution of floating macro litter along fixed trans-border transects in the Mediterranean basin](#)





Short-Term Water Monitoring System (STMS)



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To whom is it addressed?

Marine protected area (MPA)
managers, scientists

Theme

Water quality

Type of tool

Monitoring tool

Key words

Water quality, natural park, water pollution, monitoring

Pilot areas



1. What problems would this tool solve?

The effective management of any type of water body requires comprehensive, up-to-date data on its physical, chemical, and biological quality. The Short-Term Water Quality Monitoring System (STMS) can be used in situ to detect an increase of specific pollutants in water. It uses an automatic identification system network that notifies designated recipients in real time. By using the STMS, natural parks can improve their management capacities in relation to biodiversity protection, climate change, and they can also place an economic value on the territory, such as that provided by tourism.

2. What is needed for its implementation?

Technological infrastructure

Availability of electricity and internet connectivity, preferably through mobile networks, in the location chosen to place the sensors.

The hardware components required are the following:

1. Buoy/mast – Available depth/water flow speed. Must be able to hold the multiprobe base unit, battery, solar panels (if used) and the data logger.



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2. Multiprobe base unit – Needs to be able to hold the chosen sensor probes. In the case of optical sensor heads, a wiper is recommended (it also takes up one spot in the multiprobe base unit).
3. Sensors (sensor heads) – The resolution and reliability of the measurements are important, so users must make sure they are getting sufficient accuracy based on their needs. Different sensor types require different maintenance – optical sensors can work for much longer unsupervised and there is not much else to be done for maintenance other than cleaning the sensor heads.
4. Power source – In the case of solar panels, keep in mind that the power needs to be able to charge the battery sufficiently when sunlight is available. The number of solar panels can improve the input power and can also influence the percentage of time the panels are getting sunlight (different orientation configurations are available). Solar panels also require a regulator that can provide a suitable output for the battery.
5. Battery – The battery needs to provide the correct voltage and amperage to power the system. The capacity of the battery should be based on the battery life required and the total power drain of the system (the power drain is mostly affected by how often measurements are taken and then sent to the server).
6. Data logger – Should be compatible with the multiprobe base unit to collect the data from the sensors (compatible connections). Preferably contains local storage for situations when an internet connection might not be available. Should send data to the remote location (server) for storage.
7. Internet connectivity module – GSM (2G/3G/4G) in most cases where there is sufficient GSM coverage. Can be integrated with the data logger.

Dedicated software should be chosen to collect, display, and manage the data collected.

Training

Training is recommended to explain the use of the software to all potential users.

Investment

Installing a network of STMS buoys to detect pollution intake would be cost-effective, and cheaper than traditional sampling and analysis. Some guidelines for the cost-benefit analysis of implementing the STMS have been developed; they suggest the indicators to use to assess impact categories, such as revenues, compliance with regulations, costs of remediation in case of pollution events, daily management costs, and water monitoring effectiveness.

3. How to use it?

Concept

The STMS consists of installing a buoy in the water of the protected areas to be monitored, equipped with a multiprobe base unit with battery-powered sensors for relevant water quality parameters, solar panels for charging the battery, a data logger for all measurement values and a GSM modem to send the measurement values to a server. Data are sent both to the Parks' server and to the EcoSUSTAIN server. Thus, the Parks receive data directly on their computers, displayed in tables and graphs, and if measurements are outside the acceptable ranges, an alarm is sent to selected relevant users. Data are also published on the EcoSUSTAIN open online portal, where authorised users can create periodic reports, which are also publicly available on the portal.

Recommended implementation frequency

The first step is to choose the parameters to monitor, which may include a range of physical (temperature, conductivity, turbidity), chemical (dissolved oxygen, pH), and biotic (blue-green algae and Chlorophyll-a pigments) variables. Factors such as the cost of the probes, their duration and robustness in specific conditions, and the maintenance requirements should be considered.

The second step is the choice of locations for installing the buoys, based on several considerations such as the purpose of monitoring, ease of maintenance, and proximity to navigational routes.

Data are then collected and transmitted at predetermined frequencies, which may be set according to the Water Framework Directive (WFD) minimum requirements. Data are then displayed on the screen in the form of graphs and tables. Statistical values are derived from the raw data (e.g. minimum, maximum and average values from the period). The data are only processed while viewed within the application as live data or through the created reports, but the data itself are valuable and can be further processed outside of the STMS solution by using any desired tool.

4. What challenges may arise?

Visual observations and automatic recording through photo/video may be affected by weather/sea conditions. Costs may be high if using dedicated research vessels. Moreover, from large vessels and aircraft it is possible to detect only marine litter that is larger than 20 cm. Finally, the dimension of the objects at sea may be difficult to assess; to overcome this

issue, the protocol suggests using a ruler with a string of fixed length, and measuring the apparent length of the object and the degree of distance from the horizon line, in order to have an estimation of the object's real size. The monitoring of ingestion may depend on the geographic coverage of the species and the availability of animals.

5. What are the expected results?

Quantitative results

The application of the protocol allows for the collection of consistent, coherent, and comparable data on floating marine litter on both a large scale (i.e., at the Mediterranean basin level) and local scale (i.e., at an MPA level), and on ingested litter by biota.

Transfer potential

The protocol has been specifically developed for the Mediterranean, but it may be used to collect marine litter data in other marine contexts as well.

Key information

- In the Albufera National Park, more than 4,000 measurements of 6 different parameters have been taken in one year. Using these data, researchers are able to study the changes in water parameters in relation to atmospheric conditions.
- Thanks to the implementation of SMTS, the Krka National Park was able to collect for the first time a continuous data series, 24 hours/day, every day, in every season. These series are very useful, not only to the Park, which for the first time owns the water quality monitoring data, but also to other stakeholders that perform research or data sampling in the area.

The data collected for the four pilot sites and associated information can be found in the spatial viewer created by the project: <http://ecosustain.info/>

For further information

Project contact: EcoSUSTAIN

- Communication Manager: Samir Jodanovic

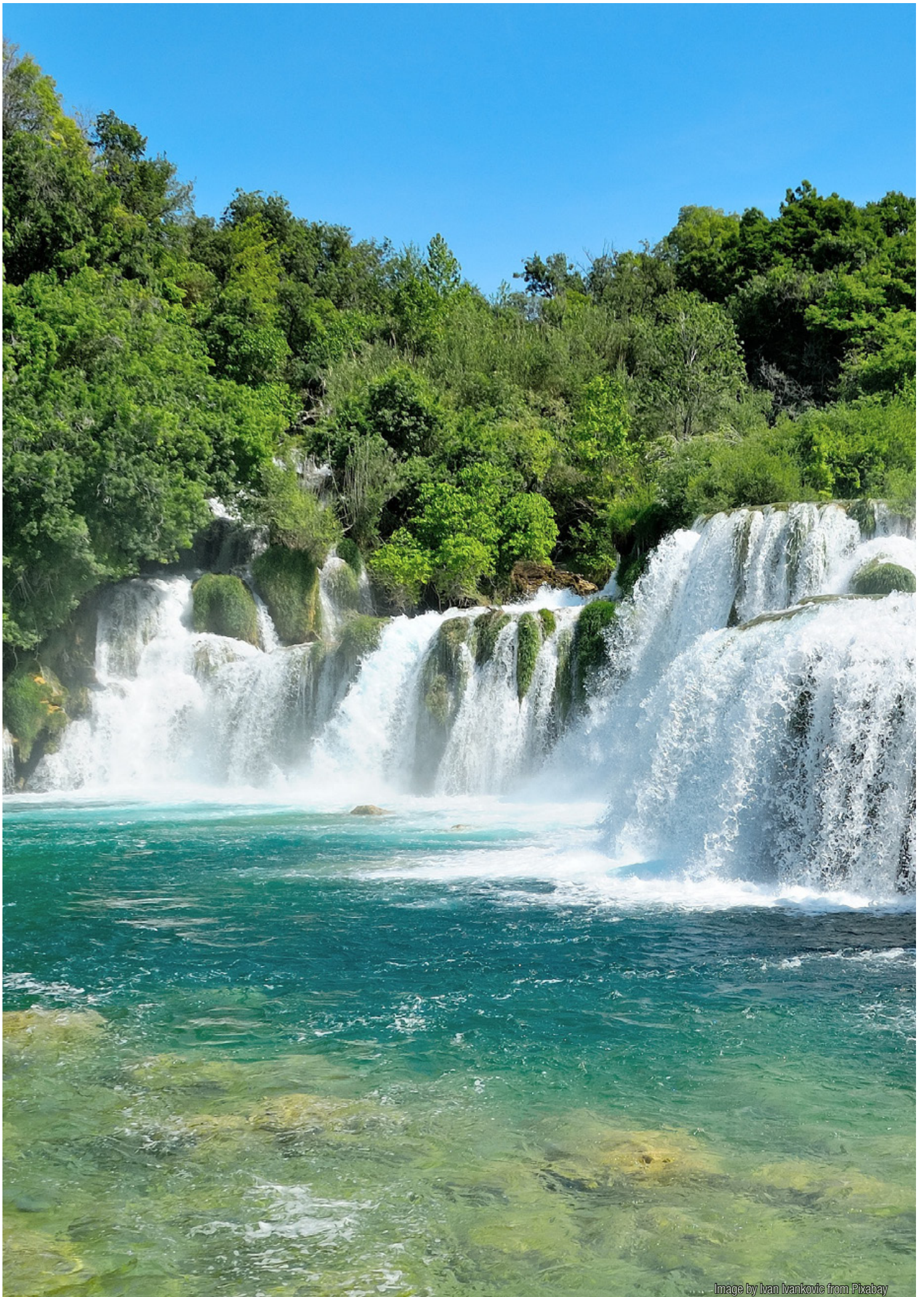
Links of interest:

- [Water Monitoring implementation Manual](#)
- [Costs and Benefits of STMS](#)
- [Lessons learnt during the pilot implementation](#)
- [Biodiversity Protection Knowledge Platform – EcoSUSTAIN project viewer](#)
- <http://ecosustain.info/>



This tool is part of a Mediterranean Toolkit for Biodiversity Protection developed by the PANACeA partnership:







Long-Term Water Monitoring System (LTMS)



To whom is it addressed?

Marine Protected Area (MPA)
managers, scientists

Theme

Water quality

Type of tool

Monitoring tool

Key words

Water quality, natural park, water pollution, monitoring,
Sar sensor imagery

Pilot areas



1. What problems would this tool solve?

The effective management of any type of water body requires comprehensive, up-to-date data on its physical, chemical, and biological quality. The long-term monitoring system (LTMS) is an integrated solution for monitoring environmental indicators via satellite using Earth Observation techniques and relevant satellite imagery processing/classification, and for preparing meta-information, presented on the client's graphical user interface (GUI). It allows for high-frequency (i.e., more than once per month) screening of a water body, without the need for field visits.

2. What is needed for its implementation?

Technological infrastructure

A PC and the LTMS client application software, which can also be installed remotely if necessary.

Training

A basic knowledge of Geographic Information Systems (GIS) is required. A training session may be useful to learn the use of the software, which is very user friendly.

Investment

The system does not require any maintenance.

3. How to use it?

Concept

The LTMS allows measuring environmental indicators of water quality (i.e., Chlorophyll-a, NO₃, NH₄, phosphorus, pH, and dissolved oxygen) by using Optical and Synthetic-Aperture Radar (SAR) sensor imagery and data. The LTMS is an important complement to traditional monitoring, as it provides a depiction of trends for water quality-related parameters. It can detect degraded and potentially sensitive areas, such as one-time and diffused sources of pollution.

Recommended implementation frequency

The selected satellite (Landsat 8) passes over the pilot area three times per month, assuming no weather constraints. The images are selected and processed using a pre-set algorithm. Then, the final result is stored in the server and the Protected Area Management Body receives the final image.

- Verify at an early stage with the provider the frequency of measurements and of data detection;
- Test the accuracy of the measurements under different weather conditions.
- Run the monitoring activities for at least a couple of years, as they provide useful long-term trends.
- Involve all relevant stakeholders in the pilot monitoring, including scientists and research institutions whose area of interest is water quality monitoring, as they can provide useful advice and support, as well as data for the system calibration, comparison and integration.

Key information

- Lake Karla was chosen for the LTMS pilot because it is a heavily modified body of water under the protection of Natura 2000 Network and it hosts important species of fish fauna and avifauna.

4. What challenges may arise?

Cloudy meteorological conditions may negatively affect the clarity of the pictures retrieved by the satellite. A potential drawback lies in the shallowness of the lake. Calibration with field measurements and grading parameters into standardised classes may be useful to offset drawbacks and improve data quality.

5. What are the expected results?

Quantitative results

The LTMS is able to capture monthly and annual trends, and is able to monitor entire water bodies at 30 x 30 pixel resolution.

Transfer potential

The LTMS can be easily used to monitor water quality in any other bodies of water across the Mediterranean. The following recommendations apply:

- Carefully select the parameters to be monitored, based on the needs and requirements of the Park, but also on feasibility with the system provider.



For further information

Project contact: EcoSUSTAIN

- Communication Manager: Samir Jodanovic

Links of interest:

- [Water Monitoring implementation Manual](#)
- [Costs and Benefits of LTMS](#)
- [Lessons learnt during the pilot implementation](#)
- [Biodiversity Protection Knowledge Platform – EcoSUSTAIN project viewer](#)
- <http://ecosustain.info/>



This tool is part of a Mediterranean Toolkit for Biodiversity Protection developed by the PANACeA partnership:





Governance Toolkit for managing Small-Scale Fisheries in Marine Protected Areas

Photo by: Helena Volpi from Pixabay

To whom is it addressed?

Marine Protected Area (MPA) managers

Theme

Fisheries

Type of tool

Management tool

Key words

Small-scale fisheries, governance, toolkit, co-management, MPA

Pilot areas



1. What problems would this tool solve?

Ensuring the effective management of a Mediterranean MPA requires good governance and an ecosystem-based approach that integrates the fisheries sector, particularly small-scale fishers, as legitimate actors in the decision-making process. The Small-Scale Fisheries (SSF) Governance Toolkit is the cornerstone of a bottom-up, “towards co-management” approach; it describes more than 20 actual measures to enhance the environmental and socio-economic effectiveness of MPAs in SSF management, and the degree of feasibility of each.

2. What is needed for its implementation?

Technological infrastructure

No particular technological infrastructure is required for the process of formulating and implementing the SSF Governance Toolkit. Technological requirements may arise involving specific tools that can be adopted, such as the use of video and photo cameras to improve surveillance and patrolling.

Training

Initial training may be required to establish a platform of cooperation between SSF fishers and MPA managers. Specific training activities may be implemented involving specific tools that can be adopted, such as training to enhance the capacity of rangers to enforce fisheries regulations within MPA boundaries, to improve the capacity of fishermen in surveillance activities, and to build the capacity of fishermen to monitor and report catches, sightings of endangered cetaceans and sea turtles, rare sightings and invasive species, and marine litter.

Investment

The cost and time needed to implement each of the tools included in the Toolkit have been assessed on a three-point scale (low-cost, medium-cost and high-cost) by the managers of the pilot MPAs, taking as a reference the annual budget of their MPA, the manpower available to them in their MPA and the number of stakeholders they have to engage in their MPA. Based on the managers' experience, the attributes with the median highest needs (in terms of cost, time and stakeholder involvement) to implement the corresponding tools were Enforcement and Improving SSF sustainability.

3. How to use it?

Concept

All the tools and management measures that are described in the toolkit have been tested in the 11 pilot MPAs. They have been grouped into five main categories:

1. Enforcement – enhancing MPA surveillance and patrol capacities.
2. Engaging fishermen in the decision-making process.
3. Knowledge and ownership – ensuring decisions are based on all forms of knowledge and information, and encourage awareness and education among stakeholders.
4. Environmental sustainability of small-scale fisheries.
5. Economic sustainability, i.e., improving the income of small-scale fisheries.

The SSF Governance Toolkit illustrates the results of testing these measures, and the lessons learned from their implementation.

Recommended implementation frequency

An effective and balanced co-management system must be a dynamic and adaptive process, since MPAs' conservation-related targets can vary over time, fisheries can evolve, like any other economic sector, and, in particular, the status of the environment (including fish stocks) can worsen/improve. For this reason, the system must have a baseline "SSF management plan" and anticipate a shared "control room" (e.g. a formal committee), where MPA managing bodies and fishers meet regularly and take decisions to tackle the changes needed to improve the efficiency of the system and

the effectiveness of its actions in relation to the goals set.

4. What challenges may arise?

- A genuine willingness to share power, especially by MPA managers, is a fundamental requirement for co-management to be effective.
- Moreover, local fishers should strive to speak with one voice, or to reach a common position with respect to the MPA proposals.
- The involvement of other local actors, such as government agencies, researchers, NGOs, and other economic sectors such as the diving industry, can be very useful, although these actors cannot replace the decisions of artisanal fishers.

5. What are the expected results?

Quantitative results

By implementing the tools included in the Governance Toolkit for managing Small-Scale Fisheries in MPAs, an effective and shared management system can be built for Small-Scale Fisheries in Mediterranean MPAs.

Transfer potential

The SSF Governance Toolkit can be a useful instrument for any MPA manager who wants to improve governance in their MPA through better cooperation with local small-scale professional fishers. The tested tools can address some of the most recurring problems any MPA manager encounters when dealing with SSF in or around the MPA.

Key information

- In the Telascica MPA (Croatia), thanks to the activities stimulated by the FishMPABlue2 project, the Ministry of Agriculture – Directorate of Fishery has established a Working Group for drafting an "SSF management Plan", and local small-scale fishers are one of the main actors in this working group.
- In the Torre Guaceto MPA (Italy), as part of the meetings for the FishMPABlue2 pilot action implementation, the local small-scale fishers agreed to sign a Memorandum of understanding to enlarge the MPA surface area.
- In the Es Freus MPA (Spain), the Regional government agreed to cover half the costs of the equipment necessary to install video-cameras on the island of S'Espardell, and it stated its willingness to disseminate this tool into other MPAs in the Balearic region, in order to increase the MPA's real-time surveillance capacity.

For further information

Project contact: FISHMPABLUE2

- Luca Santarossa (Federparchi) – Project Manager
- Anne Remy (WWF Med) – Communication Manager
- Paolo Guidetti (University of Nice) – Scientific Coordinator

Links of interest

- [Small-scale Fisheries Governance Toolkit](#)
- [Small-scale Fisheries Governance Toolkit Leaflet](#)
- [Artisanal fishers and MPAs: a partnership for sustainability in the Mediterranean](#)
- [Biodiversity Protection Knowledge Platform – FishMPABlue2 project viewer](#)
- [Results of the pilot actions implementation \(i.e. comparison between results of 2017 and 2018 monitoring campaigns\)](#)



This tool is part of a Mediterranean Toolkit for Biodiversity Protection developed by the PANACeA partnership:





Monitoring methodology for small-scale fisheries within and around MPAs

Photo by: Romanos Senikidis on Unsplash

To whom is it addressed?

Marine Protected Area (MPA)
managers, decision-makers, scientists

Theme

Fisheries

Type of tool

Management tool

Key words

Small-scale fisheries, monitoring,
MPA

Pilot areas



1. What problems would this tool solve?

Successful MPA management practices should properly address the complexity of Small-scale Fisheries (SSF) and their impacts, not only on the environment through the extraction of fishing resources, but also on dependent social and economic systems. In this regard, there is clearly a need to collect relevant data concerning multiple aspects of SSFs management in order to develop and adapt sound management plans and strategies.

This document adopts an overall multidimensional approach, and suggests different and integrated methodologies to collect data on the specific variables that should be monitored to support the development of sound SSF management in and around MPAs, the goal being to attain a win-win scenario for both conservation and fisheries goals.

2. What is needed for its implementation?

Technological infrastructure

- A combination of an Underwater Visual Census (UVC) and Horizontal Baited Underwater Video systems (H-BUVs) is suggested to monitor fish assemblages; UVC using

strip transects of 25×5 m (a standard surface largely used globally, and in the Mediterranean Sea in particular) are performed by divers swimming at constant speed, identifying, counting, and estimating the size of all individuals within 2.5 m on either side of the transect line. Each H-BUVs unit consists of a stainless steel frame with a mesh bag on one end containing a fixed amount of bait (i.e., crushing sardines to ensure greater dispersion of the plume, usually 400 gr of *Sardina pilchardus* per replicate), and supporting, on the other end, two GoPro Hero 3 high-resolution (720p) stereo-video cameras located in a waterproof housing. Each H-BUVs unit is attached by a rope to a large buoy on the surface, along with two small buoys in proximity of the unit.

- Squidpops are also recommended to assess predation intensity related to mesopredatory fishes. Squidpops consist of a 1.3-cm diameter disk of dried squid mantle tethered to a 30-60 cm rod, which is either inserted in the sediment in soft-bottom habitats or secured to existing structures. Underwater, tethered rods are spaced 1-2 m apart in single or double rows and filmed by an underwater camera for the first hour.

- A photo camera to take pictures of fish landings and catches, and image-analysis software (e.g., ImageJ) to assess the length and wet weight of each specimen in the laboratory.

Training

Specific training is required to design monitoring activities and to use the above-mentioned techniques.

Investment

Specific equipment (cameras, software, reels etc.) has to be purchased to perform the suggested methodologies. In addition, normal costs for activities at sea should be planned for.

3. How to use it?

Concept

The Guidelines cover the monitoring of the following variables and techniques:

- Environmental factors: Fish Assemblages, using an underwater visual census with strip transect and Horizontal Baited Underwater Video systems (H-BUVs); and assessing the potential effect of MPAs on predation intensity and related top-down ecological control using squidpops.
- Economic factors: comparison between the catches per unit of effort (CPUE) and the revenue per unit of effort (RPUE) obtained within the MPA, with those obtained in open fishing areas outside the MPA using the same gear and approximately within the same bathymetric range and habitats.
- Other social, cultural, governance, and health factors: other domains (and specific variables) of the human dimension were assessed, related to the human well-being of small-scale fishers' communities, using extensive literature review and expert knowledge assessment through two questionnaires.

Recommended implementation frequency

Multi-year monitoring studies are recommended in order to evaluate the temporal trends of the assessed outcomes. In this context, it is fundamental to stress the importance of planning robust sampling strategies and designs that highlight the effects of MPAs on a set of variables, while accounting for natural and spatial variability in the investigated system.

4. What challenges may arise?

Fishers may be unwilling to participate and answer the questionnaire; hence, some best practices have been identified, which include the recommendation to have a neutral and objective stance, to interview fishers when they are not too busy, and to ensure the confidentiality of the interview. A similar problem could arise for monitoring small-scale fisheries catches at landing.

It is advisable, therefore, that scientific studies and monitoring be conducted in partnership between MPAs scientific or technical personnel and scientific institutions, to make sure that the methods chosen, the way the monitoring is actually conducted in the field, and the way data are analysed, allow for proper conclusions to be drawn.

5. What are the expected results?

Quantitative results

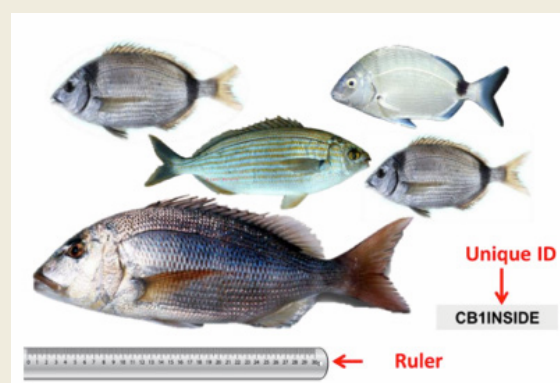
By implementing these methods, essential data can be collected that describes environmental, economic, and social aspects related to SSFs, which are fundamental to support effective management strategies.

Transfer potential

These Guidelines are ready to be adopted and applied by any MPA in the Mediterranean.

Key information

Representative example of the methodology to collect small-scale fisheries catch data.



For further information

Project contact: FISHMPABLUE2

- Luca Santarossa (Federparchi) – Project Manager
- Anne Remy (WWF Med) – Communication Manager
- Paolo Guidetti (University of Nice) – Scientific Coordinator

Links of interest

- [Common methodology for the design and execution of sound scientific monitoring of small-scale fisheries within and around an MPA](#)
- [SSF Governance Toolkit](#)
- [Results of the pilot actions implementation \(i.e. comparison between results of 2017 and 2018 monitoring campaigns\)](#)
- [Biodiversity Protection Knowledge Platform – FishMPABlue2 project viewer](#)



This tool is part of a Mediterranean Toolkit for Biodiversity Protection developed by the PANACeA partnership:





Climate Change Monitoring Protocols

© MPA-Adapt - Project

To whom is it addressed?

Marine Protected Area managers, marine scientists, national oceanographic agencies, hydrographic offices, policy-makers, and the interested general public

Theme

Climate Change

Type of tool

Monitoring Tool

Key words

Climate change, MPAs, seawater temperature, mass mortality

Pilot areas: 70+ sites in Spain, France, Italy, Croatia, Greece, Turkey, Tunisia



1. What problems would this tool solve?

The effects of climate change and global warming are particularly alarming for the Mediterranean Sea, which is warming faster than the global oceans. The MPA-ADAPT project developed five standard protocols as a practical guide to track climate-related impacts in Mediterranean MPAs and beyond, following the requirements of the Ecosystem Approach and in the framework of the UNEP/MAP Barcelona Convention. The resulting outputs of the protocols provide key information to support mitigation strategies and effective adaptation plans in Mediterranean MPAs.

2. What is needed for its implementation?

Technological infrastructure

Materials required to monitor temperature conditions:

1. temperature data loggers HOBOTidbit v2 or HOBO-U22 and related software;
 - a fastening kit (Colson rings, ankles Colson, putty for underwater sealing, plastic gloves, and bag);
 - a tool to scratch the rock prior to attachment, and pliers or scissors for cutting.



2. Materials required to assess mass mortality events:

- a plastic board to collect data underwater;
- a diving computer to set the depth of the survey;
- a reference, such as a 50 x 50 cm quadrat, or a 50-cm bar.

3. Materials required for LEK-1 and LEK-2:

- printed copies of the questionnaire to do the interviews;
- a field guide or pictures of fish and other marine species, to assist in identifying the fish species;
- an Excel file for data collection.

4. Materials required for the fish visual census:

- a pre-printed board to collect data underwater;
- a diving computer to set the survey depth, measure transect time (5 minutes) and water temperature.

Training

- Video tutorials are available in the T-MEDNet Platform on how to deploy temperature data loggers for monitoring seawater temperature, and on how to conduct mortality surveys. A video tutorial for fish visual census is also available in the ISPRA and MPA-ADAPT YouTube channel.
- Temperature monitoring can be conducted by certified scuba divers, working in pairs. The mass mortality assessment and the fish census can also be performed by recreational divers with adequate training. For LEK-1 and LEK-2, interviewers should be practitioners skilled in species identification and with good knowledge of local fisheries.

Investment

The necessary material to implement the protocol is estimated to cost 1,800 Euro per MPA.

3. How to use it?

Concept

Five protocols have been developed to:

1. Monitor temperature conditions – temperature is recorded every hour using data loggers deployed every 5 m from surface to a depth of 40 m, and recovered on an annual or semi-annual basis. The resulting data series can be used to build robust baselines and track hydrological changes to better understand the impacts that climate warming has on marine coastal biodiversity.
2. Assess the impact of mass mortality on macrobenthic species dwelling in coastal waters. The aim of this protocol is to track the conservation status of macrobenthic species populations.
3. Explore Local Ecological Knowledge to reconstruct historical changes (LEK-1) – this protocol can be used to interview experienced fishermen or other sea users, to gather information on historical changes in species abundances and distribution, and to detect new species early.
4. Explore Local Ecological Knowledge for periodical monitoring (LEK-2) – this protocol can be used to interview experienced fishermen or other sea users, to regularly monitor climate-sensitive species of both native and exotic origin.
5. Implement a fish visual census of climate change indicators – this protocol can be used to assess the abundance and distribution of specific fish species, chosen as reliable indicators of climate change in Mediterranean MPAs. Local species targets can be added by MPAs, based on local monitoring needs, ease of recognition, interaction with fisheries, increase/decrease in the area, potential impacts on the

environment/fisheries/human activities.

These protocols are inspired by the concept of Essential Climate Variables, and focus on a restricted set of simple measurements to capture greater aspects of environmental change. The indicators have been chosen on the basis of their scientific relevance, feasibility, and cost effectiveness.

Recommended implementation frequency

1. Monitoring temperature conditions: data loggers should be set up and retrieved every 6 months, generally before and after the warm season. A yearly periodicity can be adopted for remote sites.
2. Assessment and monitoring of mass mortality: mass mortality should be monitored every 12 months after summer, i.e. from mid-September to mid-October, or if mass mortality events are observed.
3. LEK-1: interviews can be done at any time of the year.
4. LEK-2: interviews should be done every 12 months; the respondents should ideally remain the same across time.
5. Fish visual census: the fish census should be performed every 12 months, between August and October; for recreational divers, the census can be performed at any time of the year.

4. What challenges may arise?

To ensure the continuity of temperature data series, temperature data loggers should be launched with the correct

parameters, prior to being placed again in the field, and solidly attached to the substrate to avoid losing them due to rough sea conditions.

Looking for small gorgonian colonies or specimens (less than 15 cm in height) may not be straightforward during the sampling; hence, they should not be taken into account. Fishermen may distrust researchers and practitioners; for this reason, special attention should be paid to the approach used during the interviews, e.g., by showing a genuine interest in the answers and behaving like a facilitator, not an expert.

5. What are the expected results?

Quantitative results

By implementing the proposed protocols, important physical and biological data can be collected, data that are necessary to understand climate change and seawater warming in the Mediterranean, and to support the drafting and implementation of adequate management strategies by Mediterranean T-MEDNET, Med-IAMER, AWI, and VLIZ, among others.

Transfer potential

The protocols can be shared, downloaded, and printed as needed by Mediterranean MPAs and for use in non-commercial products or services, provided that appropriate acknowledgment of the MPA-ADAPT project as the source and copyright holder is given.

Key information

- MPA-ADAPT has been used to set up new sites for seawater T monitoring, and resulted in over 2 million new T data points from around 30 sites declared by new users along the coasts of Provence, Corsica, Sardinia, as well as in the Tyrrhenian, and in the central and southern Adriatic Sea (<http://t-mednet.org/t-sites/t-figures>).
- The mass mortality monitoring protocols are currently being applied in several MPAs.
- The Fish Visual Census of climate change indicators has been applied in pilot actions with recreational divers, in collaboration with PADI (the largest recreational divers' organisation), providing promising results. More than 200 censuses were conducted within the MPA-ADAPT project in the Portofino MPA and in the Isole Pelagie MPA.

For further information

Project contact: MPA-ADAPT

- Joaquim Garrabou, ICM-CSIC

Links of interest:

- [T-MEDNet Platform](#)
- [Biodiversity Protection Knowledge Platform – MPA-Adapt Project Viewer](#)
- [Monitoring Climate-related responses in Mediterranean Marine Protected Areas and beyond: FIVE STANDARD PROTOCOLS](#)
- [MPA-ADAPT work on climate change and marine protected areas](#)



This tool is part of a Mediterranean Toolkit for Biodiversity Protection developed by the PANACeA partnership:







T-MEDNET Platform

Photo by: Alexis Rosenfield

To whom is it addressed?

Marine Protected Area managers, marine scientists, national oceanographic agencies, hydrographic offices, policy-makers, and the interested general public

Theme

Climate change

Type of tool

Geospatial Tool

Key words

Climate change, MPAs, seawater temperature, mass mortality, marine ecosystems

Pilot areas: 70+ sites in Spain, France, Italy, Croatia, Greece, Turkey, and Tunisia



1. What problems would this tool solve?

The effects of climate change in the Mediterranean, such as shifts in species distribution and mass mortality events, have been related to seawater warming. At present, there is no comprehensive view on these effects, which hinders an in-depth analysis of climate change impacts on marine coastal biodiversity in the Mediterranean.

The T-MEDNet platform is intended to develop a network to observe the effects of climate change on marine coastal ecosystems by promoting large-scale and long-term data acquisition, using standard monitoring protocols on seawater temperature and biological indicators.

2. What is needed for its implementation?

Technological infrastructure

The T-MEDNET Platform can be easily accessed online; only a PC and an internet connection are required.

Training

Training to use the T-MEDNET platform is not necessary. The platform website provides access to video tutorials on how to deploy temperature data loggers to monitor seawater temperature, and on how to conduct mortality surveys (see also the MPA-ADAPT Protocols Tool). The integration of other standardised protocols is possible.

Investment

The T-MEDNET Platform can be accessed free of charge.

3. How to use it?

Concept

A display tool allows users to explore the trend in seawater temperature, temperature anomalies, and warming trends at the Mediterranean scale, both locally and in the different ecoregions. Moreover, T-MEDNet developed standard monitoring protocols to track long-term and large-scale mass mortality impacts. The database includes the network of monitoring sites and the data on the status of populations of macroinvertebrates, collected mainly by MPA managers and scientific teams through a collaborative effort.

Recommended implementation frequency

The T-MEDNet Platform is continuously updated with new data coming from several users.

4. What challenges may arise?

Sustained monitoring efforts are being conducted in a growing number of sites. The lack of recurrent funding for long-term observation initiatives and network coordination is a serious emerging challenge.

5. What are the expected results?

Quantitative results

For the first time in the Mediterranean, the T-MEDNET Platform can be used to share, access, and display:

- Seawater temperature data, providing insights on coastal thermal regimes and seasonal stratification dynamics over extensive spatial and temporal scales. Moreover, it supports the analysis of warming trends and marine heatwaves in nearshore surface waters (0-40 m), and contributes to building more realistic coastal warming scenarios for the 21st century.

- Biological impacts, providing insights on mass mortality events affecting the coastal benthic biota over extensive spatial and temporal scales. Moreover, it supports the analysis of the relationships between T-conditions and biological responses, including episodic events, in particular the onset of mass mortality events, but also changes in distribution, behaviour, and phenology. Finally, through the T-MEDNET Platform, it is possible to test and complement climate change approaches for coastal and Marine Protected Areas, from local to regional scales.

Transfer potential

The development of a collaborative platform and the provision of data ingestion, quality check, and data management services has resulted in unified databases on essential physical and biological variables for Mediterranean coastal waters. The data and information has been transferred in several ways: networking, at the national, European, and international level; data reporting (through the Digital CSIC); data sharing with EMODnet Physics (work in progress); and contributions to the Marine Copernicus Ocean State Report issue #3 (in press, summary available online); and through various scientific publications. The yearly data and information update is an objective of the network coordinators, as they seek recurrent funding schemes.

The T-MEDNet initiative is a successful end-to-end, bottom-up collaborative story between marine scientists and marine protected area managers. The approach and the tools have been set with the aim of building a representative coastal network on a Mediterranean scale, which is why they can be easily implemented in other European and Regional Seas.

Key information

- Continuous T-series are now logged in more than 70 sites, mostly in the Western Mediterranean, but also in the Alboran, Adriatic, Ionian, Aegean, and Tunisian sub-basins, resulting in a unified quality-checked database.
- The T-MEDNet database has been crucial for analysing the inter-annual variability of the stratification dynamics of coastal waters (5-40 m) under climate forcing, including the regional heatwaves of the summers of 2003 and 2006 (the warmest August and July in France since 1950 respectively) and recent marine heatwaves (2015-2018).
- As of today, there are about 200 temperature time series in the database, with almost 17 million temperature samples in 70+ sites, for depths ranging from the surface to a depth of 67 m.
- The set-up of the new module on Mass Mortality Events is an important step forward for sharing information on over 600 Mass Mortality Events through 2017, and for fostering international collaboration on recent and ongoing events (<http://t-mednet.org/mass-mortality/mass-mortality-events>).

For further information

Project contact: MPA-ADAPT

- Joaquim Garrabou, ICM-CSIC

Links of interest:

- [T-MEDNet Platform](#)
- [Biodiversity Protection Knowledge Platform – MPA-Adapt Project Viewer](#)
- [MPA-ADAPT work on climate change and marine protected areas](#)



This tool is part of a Mediterranean Toolkit for Biodiversity Protection developed by the PANACeA partnership:





AMAre WebGIS Geoportal

Photo by: AMAre

To whom is it addressed?

Marine Protected Area managers,
decision-makers, scientists, citizens

Theme

Ecosystem Approach

Type of tool

Geospatial Tool

Key words

MPA, data sharing, Maritime Spatial
Planning, management

Pilot areas



1. What problems would this tool solve?

MPAs need coordinated strategies in support of sound Maritime Spatial Planning (MSP) in these areas, and to address conflict “hotspots” that require scientific-based, informed management decisions.

The AMAre WebGIS Geoportal is a web-based portal that provides MPA managers, decision-makers, scientists and citizens with a user-friendly platform for sharing spatial data and information, which is instrumental for taking informed decisions for MPA management.

2. What is needed for its implementation?

Technological infrastructure

A PC and an internet connection are necessary to access the WebGIS Geoportal.

Training

A necessary activity, envisaged in the context of AMAre, is training the personnel to use the geoportal and other tools, targeted especially at MPA managers.

Investment

No cost is associated with accessing and using the WebGIS Geoportal.

3. How to use it?

Concept

The Geoportal is an HTML5 application (ArcGIS server + Moka kit) that allows sharing, integrating and displaying data, printing maps, and other functionalities. It combines intelligent web maps with graphs, charts, tables, and text to unlock, provide access to and re-use the data relevant for managing MPAs in a coordinated manner.

The data layers are organised by themes and are described by proper metadata. Their accessibility and preservation will be guaranteed through the ISMAR Metadata Portal (ESRI Geoportal).

Recommended implementation frequency

The AMAre WebGIS Geoportal is already online and can be consulted at any time.

4. What challenges may arise?

The main challenges to using the Geoportal are related to the implementation of more advanced functions and in the

free download of the data. Spatial data are covered by a data policy defining the request protocol to retrieve data, and the community is not ready yet to meet completely the open data concept.

5. What are the expected results?

Quantitative results

Massive use of the AMAre Geoportal would have an effective impact on conservation, management and marine science. This tool can help in maritime spatial planning, in the monitoring plan implementation, to support the management plan and for dissemination purposes.

Transfer potential

To date, the WebGIS Geoportal covers only the 5 pilot MPAs involved in the AMAre project. Its coverage may be extended to include relevant data and information to support the management of other Mediterranean MPAs and to share information between MPAs at the basin level.



For further information

Project contact: AMAre

- <https://amare.interreg-med.eu/special-pages/contact/>

Links of interest:

- [AMAre Geoportal](#)
- [ISMAR Metadata Portal](#)
- [Biodiversity Protection Knowledge Platform – AMAre Project Viewer](#)



This tool is part of a Mediterranean Toolkit for Biodiversity Protection developed by the PANACeA partnership:





Sustainable management of Posidonia beach systems

Photo by: Bruno Glätsch from Pixabay

To whom is it addressed?

Marine Protected Area managers,
beach managers

Theme

Beach management

Type of tool

Management Tool

Key words

Beach, *Posidonia oceanica*, Marine
Protected Area, banquettes, coastal erosion,

Pilot areas: Spain, France, Italy, Greece, and Cyprus



1. What problems would this tool solve?

Although there is clear scientific evidence and consensus of the ecological role and relevance of *Posidonia oceanica* and dunes in coastal ecosystems, the lack of a consistent legal framework and existing social perceptions are preventing their sustainable management. Moreover, many municipalities and local stakeholders are demanding sustainable solutions for the management of banquettes. New management approaches are needed, which have to focus on the conservation of the integrated coastal ecosystem, considering how management practices affect the health of the entire ecosystem and the resilience of the coastline.

These Guidelines include a Governance Strategy and Action Plan to address these challenges, by providing:

- An update to the existing perceptions by different stakeholders and the existing policy framework for the management of Posidonia banquettes
- A Guide on existing methods and tools for the sustainable

use of seagrass banquettes and associated dune systems;
and

- An action framework for the Mediterranean and a locally oriented toolkit with recommendations for the sound management of Posidonia and dune systems.

2. What is needed for its implementation?

Technological infrastructure

No technological requirements are specified in the Guidelines.

Training

Personnel should receive training each year on beach cleaning policies, characteristics of the Posidonia littoral zone and how to recognise and mitigate impacts.

Investment

An approximate estimate of the costs associated with each removal option (high-low) is included in the Guidelines.

3. How to use it?

Concept

The Guidelines include a framework of reference for decision making, particularly for large Posidonia banquettes, that considers beach functions (protection and recreation) and the integration of the ecosystem. The strategic objective is to achieve the sustainable management of Posidonia beaches, while maintaining the environmental value in some areas (e.g. Protected Areas), and the recreational value in others. The tactical level reflects beach typologies in order to take into consideration the (local) social expectations and present perceptions while also maintaining the integrity, ecological function and environmental values of the Posidonia coastline. At the local level, before any activities are undertaken, benchmarking will help to define a base line: the existing dynamics of the coastal zone and the seagrass deposition and formation of banquettes on the beach/es.

At an operational level, measures for managing Posidonia banquettes are identified and implemented: a) to maintain the ecosystem (minimise interference with the process of sand and nutrient deposition from banquettes); b) to improve the situation if erosion is present or restoration activities are needed and c) to limit the impact on the recreational value of surrounding areas and to ensure that existing and planned recreational uses are balanced with maintaining ecosystem integrity. Feasibility assessments for each option should be carried out for the evaluation. Finally, the monitoring and evaluation of interventions consists of selecting a series of indicators to monitor the status of the coastal environment, including the beaches and associated dunes.

Recommendations are included on beach cleaning (avoiding the use of mechanical methods whenever possible), on disposal options, access of transportation vehicles to the beach, use of the banquettes, and on the issue of beach certification schemes.

Recommended implementation frequency

The management framework proposed by these Guidelines should be periodically reviewed to account for any variation in the ecological and socio-economic systems involved in the assessment and the outcomes of Posidonia banquette management.

4. What challenges may arise?

Each approach to remove Posidonia banquettes may encounter specific limitations, which should be carefully considered in advance. Some of these have been identified in the Guidelines for the following techniques: disposal offshore, relocation to a point higher in the beach, disposal off-site from the beach, use of heavy machinery on sandy beaches, and the use of machinery on dunes. As an indicative example, the disposal offshore of the banquettes removed from beaches may threaten the persistence and productivity of seagrass and other marine habitats and reduce water quality. As another example, the relocation to a higher point on the beach may reduce the recycling of nutrients and sand back to the sea, with higher maintenance costs.

5. What are the expected results?

Quantitative results

The effective implementation of these Guidelines will considerably improve the management of Posidonia banquettes in Mediterranean beaches and dunes.

Transfer potential

These Guidelines may be applied by any Mediterranean MPA manager, as they include general recommendations that are applicable to the whole Mediterranean basin. The Guidelines also include a transnational integrated strategy and action plan, which aims to orient regional and national policies and fund bodies and research institutions towards creating suitable conditions for implementing sustainable beach and coastal management practices across Mediterranean areas.

Key information

- Posidonia oceanica forms large meadows that are widely distributed along the Mediterranean coastline between the surface and 44 m depth in the clearest waters. Recent estimates suggest that its overall known distribution is about 12,247 km², with more than 50% within EU territory (Telesca et al., 2015).
- It has been estimated that on some Mediterranean beaches, up to 7,000 tonnes of seagrass deposits can be present during the winter.

For further information

Project contact: POSBEMED

- <https://posbemed.interreg-med.eu/special-pages/contact/>

Links of interest:

- [Governance and Management of Posidonia beach-dune systems \(in English, Spanish, French, and Greek\)](#)
- [Biodiversity Protection Knowledge Platform – POSBEMED project viewer](#)
- [Poster, leaflet and videos](#)
- [Telesca et al., 2015. Seagrass meadows \(Posidonia oceanica\) distribution and trajectories of change.](#)





Common Monitoring Approach for Marine Protected Areas

Photo by: AMARé

To whom is it addressed?

Marine Protected Area managers, scientists

Theme

Ecosystem Approach

Type of tool

Monitoring Tool

Key words

MPAs, monitoring, human activities

Pilot areas



1. What problems would this tool solve?

Mediterranean MPAs are in need of data to identify key pressures, to understand the effects of human activities, plan concrete actions to protect coastal and marine ecosystems, and monitor the effectiveness of the protection measures implemented.

To address this need, the AMARé project adopted a common monitoring approach to assess the effect of human stressors on three specific habitats: *Cystoseira* spp., *Posidonia oceanica*, and coralligenous formations.

2. What is needed for its implementation?

Technological infrastructure

The common monitoring of the three habitats does not require very expensive or significant technological infrastructures. The automatic acquisition of biological data by specific sensors and robots is under study in many EU projects and will be the future challenge in the framework of the Blue Growth, in keeping with the Marine Strategy Framework Directive (MSFD) vision. At the moment, well-trained MPA staff focusing on a few response variables (macroalgal and seagrass canopy cover, *Posidonia* shoot

density, cover and number of conspicuous species and functional groups in coralligenous formations) can provide the solution to ensure MPA monitoring. These response variables can be assessed by visual estimates, macro-photographic records and video by ROV.

Training

Training activities are recommended for MPA staff to continue with the direct monitoring, based on continuous interactions with research institutions and environmental agencies that can also support data acquisition and analyses.

Investment

Recent large-scale assessments showed that MPAs often lack of budget dedicated to monitoring. In the Management Plan, the costs of monitoring should be included and constant (operating) external financing should be ensured to support long-term monitoring. In addition, a greater exchange of information between MPA managers and MSFD managing authorities to be fully aware of each other's monitoring objectives, plans and actions is largely advised to optimise costs.

3. How to use it?

Concept

Monitoring is an integral component of marine area management because it provides the data required to evaluate changes in marine habitats and species as a result of the implementation of MPAs. All MPAs should have monitoring sites to track changes in vulnerable species/habitats, inside and outside MPAs. Methods should be consistent across MPAs to yield comparable results. Monitoring should not be confined to the biological components. It should be linked to environmental variables, human uses and to the socio-economical benefits coming from managing MPAs.

Recommended implementation frequency

One sampling date (May-June) is often enough to support long-term monitoring on biological variables.

4. What challenges may arise?

The challenge is to have a network of protected sites that are monitored using the same approach to common response variables within the framework of the MSFD. There is still a clear challenge in reaching a threshold between overall scientific relevance, the need for (EU) legislation without compromising interoperability at the Mediterranean level, and the feasibility when defining the variables to be monitored. Sharing this information is also challenging since it requires

more communications among MPAs managers and dedicated platforms.

5. What are the expected results?

Quantitative results

At present, MPAs managers are often not aware of the current status of their protected areas and the efficacy of conservation measures. Fine-scale, quantitative information provided through monitoring is crucial to inform management about the effects of protection and the sustainability of human uses. This quantitative information should be gathered by using appropriate sampling designs with the necessary statistical power to detect ecologically, economically and socially relevant changes compared to external, non-protected areas.

Transfer potential

The Interreg project AMAre (<https://amare.interreg-med.eu/>) is showing that close collaboration between scientists and the MPA managers is leading to in-depth knowledge on the distribution of biodiversity and on the distribution of human uses, through the creation of a spatial geoportal that can be used within each MPA and across MPAs. This is a good example of the tools suggested to increase and share knowledge and support monitoring in MPAs.



Photo by: AMAre

For further information

Project contact: AMAre

- <https://amare.interreg-med.eu/special-pages/contact/>

Links of interest:

- [Biodiversity Protection Knowledge Platform – AMAre Project Viewer](#)



This tool is part of a Mediterranean Toolkit for Biodiversity Protection developed by the PANACeA partnership:





Guidelines for drafting a standard Marine Protected Area Management Plan



Photo by: AMARE

To whom is it addressed?

Marine Protected Area managers

Theme

MPA management

Type of tool

Management Tool

Key words

MPAs, management, conservation targets

Pilot areas



1. What problems would this tool solve?

The existing international context, represented by the Convention on Biological Diversity (CBD) and the Barcelona Convention - SPAMI Protocol of the UNEP-Mediterranean Action Plan, among others, requires that MPAs apply governance models that ensure their effectiveness in reaching the established conservation targets.

The purpose of these Guidelines, developed by the AMARE project, is to provide standard models for the governance and management of Mediterranean MPAs, to improve their

effectiveness, as well as to support the establishment of a network of MPAs.

2. What is needed for its implementation?

Technological infrastructure

Some software can be used to draw the Conceptual Model: Microsoft Visio, Open Office Draw, Miradi, or any other open-source technology stack for building diagramming applications such as www.draw.io.

Training

Training activities are recommended for MPA staff and regional protected area managers, on the methodology to be applied for drafting standard management plans.

Investment

No investments are clearly identified at the outset; rather, the Management plan should include an estimation of the costs associated with each activity envisaged, as well as the monitoring costs.

3. How to use it?

Concept

Standardisation is the sharing of a common language between node managers (directors) and network managers (public administration, consortia), to evaluate and compare the results of an action. It is not a limitation to the management action itself. In fact, every single area is adaptively managed at the local level, but the distribution and dissemination of the results must necessarily operate in a standardised manner. This approach helps to preserve biodiversity by making clear the conservation action that is taking place.

At the heart of the Guidelines lies the Conceptual Model, which is a diagram that represents the relationships between the main drivers and pressures that have an impact on one or more identified Key Targets of conservation (KTs), e.g., species, species groups, ecological systems such as habitats, or ecological or cultural processes. The first step is to identify the KT, their pressures and drivers; strategies are then chosen, and actions are selected to reduce the risks to which KT are exposed.

Recommended implementation frequency

The Guidelines should be prepared in five subsequent steps: (1) conceptualisation, (2) planning of the actions & monitoring, (3) implementation, (4) analysis/adaptation, and (5) sharing. These actions describe an iterative, participatory process that includes the identification of conservation targets, a threat analysis, the determination of actions, the monitoring plan, an analysis of the effectiveness of the actions, communication and adaptive management.

4. What challenges may arise?

The knowledge level and the legal processes may be improved through periodic interface between regional level, managers,

technicians, practitioners.

5. What are the expected results?

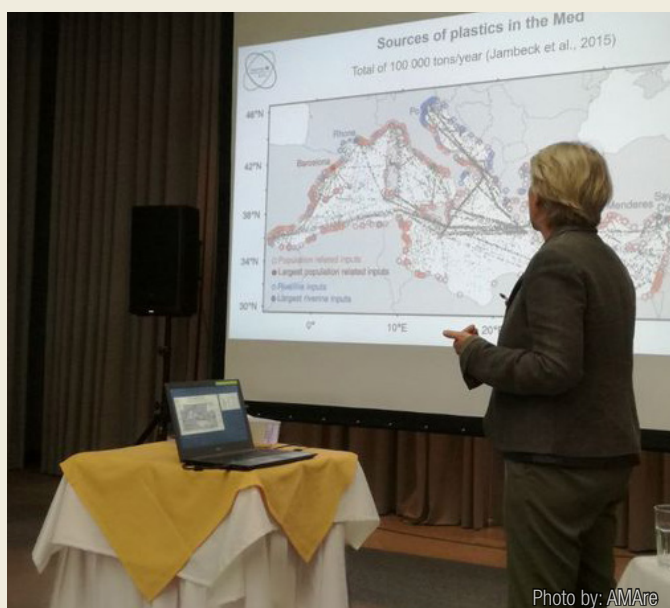
Quantitative results

The expected results of the implementation of these Guidelines lie in the adoption of a standard MPA management plan, following the envisaged iterative, participatory and adaptive approach.

Transfer potential

These Guidelines support the establishment of standard management plans across all Mediterranean MPAs. The adoption of a common management approach at the Mediterranean level is expected to yield the following benefits:

1. Assessment of biodiversity values, favourable conservation status of habitats with common indicators.
2. Clustering of main threats or pressure factors to implement regional mitigation strategies.
3. Implementation of network strategies to increase effectiveness and optimise costs.
4. Empowerment of management bodies - From public officials to practitioners.
5. Persuading politicians, funders and stakeholders that the results are tangible.
6. Increase the management effectiveness of regional networks by identifying improvement actions.



For further information

Project contact: AMAre

- <https://amare.interreg-med.eu/special-pages/contact/>

Links of interest:

- [AMAre project website](#)
- [Biodiversity Protection Knowledge Platform – AMAre Project Viewer](#)



This tool is part of a Mediterranean Toolkit for Biodiversity Protection developed by the PANACeA partnership:





Recommendations for blue growth and marine conservation



Photo by: Matt Hardy from Pixabay

To whom is it addressed?

Marine Protected Area managers, public authorities (MSP), business sector

Theme

Blue Economy

Type of tool

Management Tool

Key words

Blue economy, MPAs, recommendations, maritime spatial planning

1. What problems would this tool solve?

With the development of the Blue Economy, several maritime sectors are increasingly likely to operate more frequently both inside and in the vicinity of Mediterranean MPAs, resulting in increased environmental impacts. MPA managers tend to address interactions between maritime sectors and protected areas in an isolated manner, and management effectiveness and MPA networking are in their infancy regarding this issue. As part of the PHAROS4MPAs project, a set of recommendations is developed to improve the coordination between MPAs (and their conservation goals) and maritime economic sectors.

2. What is needed for its implementation?

Technological infrastructure

No particular technological infrastructure is needed.

Training

No particular training is needed.

Investment

No particular investment is needed to implement these recommendations.

3. How to use it?

Concept

The recommendations focus on the necessary practical collaboration between MPAs and several maritime sectors: offshore wind energy, maritime traffic and ports, cruise, leisure boating, recreational fisheries, aquaculture and small-scale fisheries. The aim is to achieve enhanced management effectiveness for marine protected areas by raising awareness, building capacity, and networking. This will be supported by the inclusion of MPA networks issues in the national maritime spatial plans that EU Mediterranean States are developing by 2021 and in the strategies developed for maritime sectors.

Recommended implementation frequency

These recommendations should be implemented whenever there are potential interactions between MPA management goals and maritime economic sectors, and in relation to the development of national MSP plans.

4. What challenges may arise?

For public authorities: the low level of influence of Maritime Spatial Planning (MSP) authorities in some countries may

require reaching out to higher authorities (e.g., Ministries). Moreover, the influence of industrial lobbies may be an obstacle. Finally, political will is necessary to strike a balance between the various uses of the sea.

For the business sector: the lack of interest from sectors that use the sea as an infrastructure (e.g., for commercial maritime transport), and the varying interest from sectors that rely on ecosystem services (e.g., fisheries). If the recommendations are too negative for a sector, there is a risk that they will reject them.

5. What are the expected results?

Quantitative results

The outcomes of the PHAROS4MPAs project include delivering common capitalisation baselines,

recommendations, and policy tools adapted for the MedPAN network, MSP authorities, the European Commission, the Barcelona Convention, and the various maritime sectors. The success of the recommendations will partly depend on the capitalisation phase, meeting with relevant stakeholders and attending regional and national meetings to make sure all key target groups have been reached and understand the value of the recommendations and their benefits. Persuasion and efforts will be needed to have the project recommendations included in MPA management plans, country planning processes, or business strategies.

Transfer potential

The recommendations may be applied by any Mediterranean MPA.

Key information

- The recommendations have been developed in the context of the PHAROS4MPAs project, which involved more than 15 partners from 10 countries: Tunisia, Malta, Spain, France, Belgium, Italy, Slovenia, Croatia, Albania and Greece.
- The recommendations involve 8 maritime sectors: offshore wind farms (energy); maritime traffic and ports, and cruises and super yachts (transport); scuba diving, leisure boating, and recreational fisheries (tourism); aquaculture, and small-scale fisheries (fisheries).



Photo by: enrique lopez garre from Pixabay

For further information

Project contact: PHAROS4MPAs

- Lead partner: WWF-FRANCE (Catherine Piante)

Links of interest:

- [Pharos4MPAs website](#)
- [Biodiversity Protection Knowledge Platform – Pharos4MPAs project viewer](#)
- [Recommendations and policy briefs](#)



This tool is part of a Mediterranean Toolkit for Biodiversity Protection developed by the PANACeA partnership:





Wetlands Contract



Photo by: Marisa04 from Pixabay

To whom is it addressed?

Local communities, farmers, fishermen, irrigation boards, hunters, herders, birdwatchers, ecotourism companies, NGOs, research centres, cultural associations, and local, regional and national government agencies

Theme

Wetlands

Type of tool

Management tool

Key words

Water management, wetlands, participatory approach

Pilot areas



1. What problems would this tool solve?

The Wetlands Contract is a voluntary governance tool, an innovative methodology for water and wetlands management. Based on the active participation of local stakeholders, its aim is to improve coordination and stimulate the effectiveness of the management and planning of protected wetlands in the Mediterranean. It consists of a series of shared, specific, and detailed commitments and actions. The Wetland Contracts take into account the problems and needs of the people, plants, and animals that live in, or benefit from, wetlands, either permanently or temporarily. Its objective is to ensure proper governance to protect wetlands and their surroundings.

2. What is needed for its implementation?

Technological infrastructure

The use of citizen participation tools for participatory processes is advised, wherever possible.

Training

5-10 should be trained people on management tools and citizen participation processes, and on action plans and management in Natural Areas.

Investment

An estimation of the overall cost to set up and implement the Wetlands Contract is currently not available. The final cost

will likely depend on factors such as the type and length of the course, the number of people to involve, and whether previous training was provided.

3. How to use it?

Concept

The Wetland Contract is composed of several elements: the legal and regulatory framework; the assessment of the wetland area; the development of alternative scenarios; stakeholders' mapping; questionnaires; and a memorandum of understanding. The contract is based on a shared vision, an action plan and the legal framework. It consists of an agreement between the stakeholders.

It is built using a participatory process, through workshops and working groups on themes such as agriculture, hydrology, environment, and tourism, focusing on 3 strategic areas: governance; environment; and economic and social development.

Recommended implementation frequency

The implementation timeline of the Action Plan that supports a Wetland Contract is 5 years. The first phase, "Participation", is divided into several consecutive steps: stakeholder mapping; preliminary diagnosis; memorandum

of understanding; targeted diagnosis; and an assessment of alternatives. The second phase, "Negotiation", is divided into two consecutive steps: specification of measures; and the adoption of the Wetland Contract.

4. What challenges may arise?

The main challenges revolve around the need to involve all the relevant stakeholders and public authorities, to link the Wetlands Contract to government tenders, and to keep national authorities as "observers" and not necessarily as contract signatories. Moreover, in the implementing phase it is necessary to prioritise the activities and clearly identify dates, budgets, and responsibilities.

5. What are the expected results?

Quantitative results

The main result of the Wetland Contracts is the improved effectiveness of wetland management through the active involvement and participation of all relevant stakeholders.

Transfer potential

The Wetlands Contract may be adopted by any Mediterranean wetland.

Key information

- It is essential that each different type of stakeholder be involved in the process to ensure improved water quality, quantity and management for the benefit of all actors that are involved or impacted by the wetland.



For further information

Project contact: WETNET

- Italian Centre for River Restoration - Giancarlo Gusmaroli

Links of interest

- [WETNET project website](#)
- [Biodiversity Protection Knowledge Platform – WetNet Project Viewer](#)
- [Wetlands contract Video](#)



This tool is part of a Mediterranean Toolkit for Biodiversity Protection developed by the PANACeA partnership:



The Biodiversity Protection Tools Catalogue

In the framework of the Project PANACeA, the MED Biodiversity Protection Community built the present Catalogue of tools for biodiversity protection in Mediterranean MPAs, covering different needs and requirements for ecosystem-based management.

This Catalogue is an update and extension of a previous report by PANACeA, which includes a preliminary version of some of the tools for ecosystem-based management in the Mediterranean being developed by the Biodiversity Protection Community projects up to 2019.



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