

# Tools for Ecosystem- based Management

Tools presented during the MED  
Biodiversity Protection Community

*Podgorica, Montenegro, 17 May 2018*



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## About this Report

This Report summarises the presentations delivered during the Interactive Session of the Open Seminar “Empowering the Mediterranean Community: Tools for Ecosystem-based Management” held in Podgorica (Montenegro) on May 16<sup>th</sup> – 17<sup>th</sup>, 2018 in the framework of project “PANACeA: Streamlining Management Efforts in Protected Areas for an Enhanced Nature Conservation in the Mediterranean Sea” (“PANACeA”). Open seminars are knowledge-sharing events that are amongst the key tools that have been articulated to advance the shared goals of the MED Biodiversity Protection Community featured by PANACeA.

The MED Biodiversity Protection Community is building a comprehensive catalogue of Tools for biodiversity protection in MPAs, covering different needs and requirements for ecosystem-based management. The Interactive Session was geared at sharing information and developing a comprehensive vision for selecting these Tools, as a first step towards discussing their value for MPA managers, triggering the identification of potential synergies amongst different tools, as well as transferability opportunities to other Mediterranean MPAs.

The Tools for Ecosystem-based Management that were presented during the Session are the subject of this Report.

### LIST OF ACRONYMS FREQUENTLY USED IN THIS REPORT

**EBM:** Ecosystem-based Management

**GEOS:** Group on Earth Observations

**ICZM:** Integrated Coastal Zone Management

**IUCN:** International Union for Conservation of Nature

**MPA:** Marine Protected Area

**MSP:** Marine Spatial Planning

**UN FAO:** United Nations Food and Agriculture Organization

**UN RAC/SPA:** United Nations Regional Activity Centre for Special Protection Areas

**OGC:** Open Geospatial Consortium

**SEIS:** Shared Environmental Information System

**SSF:** Sustainable Small-scale Fisheries

**WMS:** Web Map Server

**WMTS:** Web Map Tile Service





## Monitoring Tools for Ecosystem-Based Biodiversity Management

The MED Biodiversity Protection Community is building a comprehensive catalogue of tools for biodiversity protection in MPAs, covering different needs and requirements for Ecosystem-based Management (EBM):

- > Monitoring tools and protocols
- > Management tools
- > Geospatial tools

The following Tools are covered in this Report:

- > Monitoring tools & protocols:
  - Monitoring freshwater quality (Project ECOSUSTAIN)
  - Governance toolkit for sustainable fish stocks (Project FISHMPABLUE2)
  - Monitoring floating and ingested marine litter (Project MEDSEALITTER)
  - Monitoring climate change impacts in MPAs (Project MPA-ADAPT)
- > Management tools:
  - Governance strategy & action plan for banquettes & dune beach management (Project POSBEMED)
- > Geospatial Tools:
  - AMARe WEBGIS (Project AMARe)
  - the MED Biodiversity Protection Community's knowledge sharing platform (Project PANACeA)





## Monitoring tools and protocols

### Monitoring freshwater quality

#### Project ECOSUSTAIN • Nataša Štrok, RGO Communications

Project ECOSUSTAIN is developing a pilot application to measure water parameters in real time and provide MPA managers with real-time information on pollution levels of specific bodies of water of the PA and thereby allowing for a fast reaction to undesired parameter changes. The application further allows water quality data to be published, which can be useful for external communities such as Environmental Agencies and/or national authorities.

The Project is testing the use of new technologies (buoys, sensors and data loggers) to monitor relevant water parameters (temperature, dissolved oxygen, water pH, turbidity, blue-green algae, etc.) in different locations, such as Lake Visovac in Krka National Park (Croatia). The solution is also being tested in Bosnia, Italy and Spain, which will allow for data comparison and exchange of experiences amongst Partners working in different environments. Once the Project ends, we anticipate transferring the tool to other locations, with a special focus on National Parks.

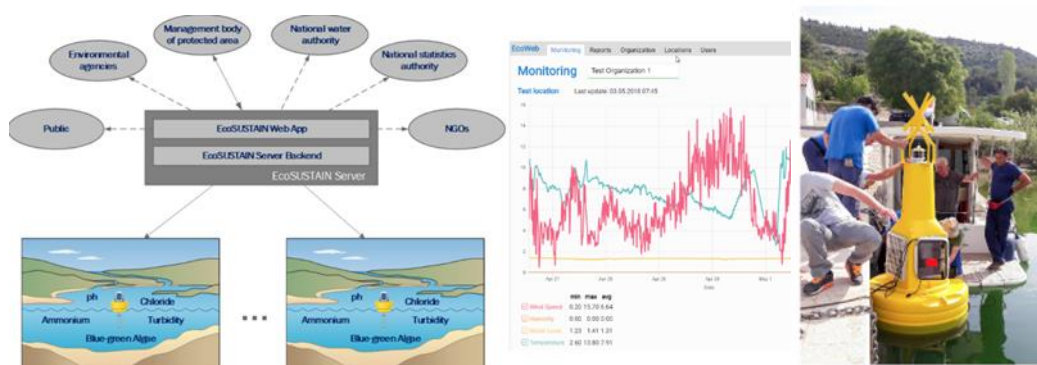


Image: Short-Term Monitoring Solutions for Freshwater Quality

### Monitoring floating and ingested marine litter

#### Project MEDSEALITTER • Roberto Crosti, ISPRA

Project MEDSEALITTER seeks to facilitate networking exchanges amongst MPAs, scientific organisations and NGOs for developing and testing efficient and cost-effective Mediterranean-specific protocols to monitor and manage litter impact on biodiversity. The project aims to lay out an appropriate methodology for collecting data, finding the best compromise amongst scale of use, scientific validity, measurement method, previous data, and practical and programmatic considerations (i.e. complexity of application or application costs). Specifically, the Project is:





- > Inter-calibrating shared protocols for monitoring the effect of marine litter on Mediterranean biodiversity.
- > Testing standardised protocols for monitoring marine litter abundance and impact through pilot studies conducted in different scenarios.

The Project is working through two distinct working groups (Working Group on Floating Plastic and Macro Litter; and Working Group on Ingested Plastic and Litter in Biota) to deliver a methodology that will allow MPA managers to actively respond and contribute to the requirements of waste and marine biodiversity legislative frameworks while improving the management of MPAs, by assessing:

- > The amount, distribution and composition of litter.
- > The rates at which litter enters the environment (sources).
- > Spatial and temporal variations.
- > The impacts of litter on biota.

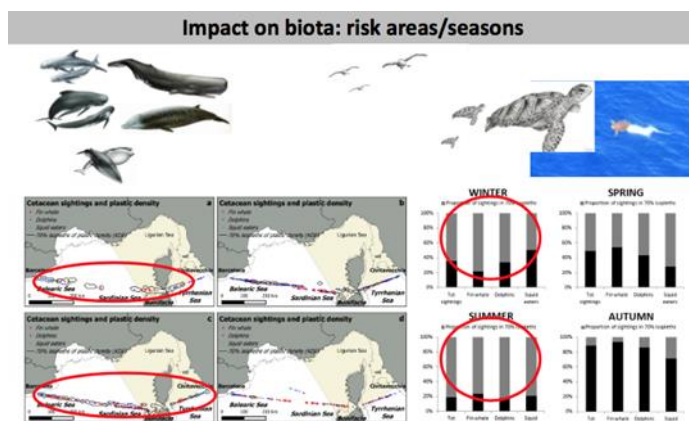


Image: Assessing impact of floating litter on biota

The resulting methodology will be integrated in the ongoing review of the JRC Guidance on Monitoring of Marine Litter in European Seas, leading to a final protocol for monitoring floating macro litter and litter ingested by biota in local and wide areas (July 2019). The protocol will be shared within networks of international MPAs (such as MedPAN) and scientific organisations to support its transferability and capitalisation.

## Governance toolkit for sustainable fish stocks

**FishMPABlue2** · Patrik Krstinic, WWF Adria

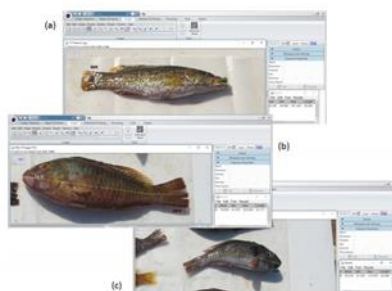
**FishMPABlue2** is working to increase the capacities of Mediterranean MPAs to govern sustainable small-scale fisheries (SSF). Working from an existing **SSF Governance Toolkit**, the Project is now addressing the environmental and socio-economic effects of SSF fisheries to deliver an upgraded Governance Toolkit that will provide methods to monitor these effects, including:





- > Environmental monitoring:
  - Underwater visual census
  - Baited underwater video
  - Squidpop
- > Socio-economic monitoring
  - Monitoring of landings (economic dimension)
  - Questionnaires (human dimension)

#### Monitoring of landings



#### Human dimension questionnaires



Image: Assessing the socio-economic effects of Small Scale Fisheries in MPAs

The SSF Governance Toolkit will allow MPA managers to make informed decisions to manage fisheries in their area of responsibility, engaging fishermen in decision-making processes and activities of the MPA to produce a SSF Management Plan based on scientific evidence and social consensus.

### Monitoring climate change impacts in MPAs

**MPA-ADAPT** • *Stefania Chiesa, ISPRA; Andrea Blaskovic & Mirka Cerni, Brijuni National Park*

Project MPA-ADAPT is seeking to provide MPAs with Tools that support the development of Climate Change Adaptation Plans. Monitoring is an essential component of these plans, which is why the Project is focusing on developing simple, standardised monitoring protocols for different variables/indicators that need to be considered:

- > Fish census.
- > Temperature.
- > Mortality assessment.
- > LEK-1 & LEK-2.

These monitoring protocols have been built into two different tools:

- > TMEDNet (temperature data + mass mortalities), which will allow MPA managers to:
  - Characterise temperature regime and anomalies.
  - Monitor warming rates.
  - Monitor mass mortality events.
- > LEK-1, LEK-2 + visual census, which will allow MPA managers to:





- Provide data on fish species occurrence, distribution and abundance.
- Reconstruct fish population historical trends.
- Improve early warning systems on alien species detection (macrofauna).

Combined together, these Tools can assess the relationships between temperature data and biological phenomena, monitoring mass mortalities of fish, shifts in fish distribution and abundance of fish indicator species.

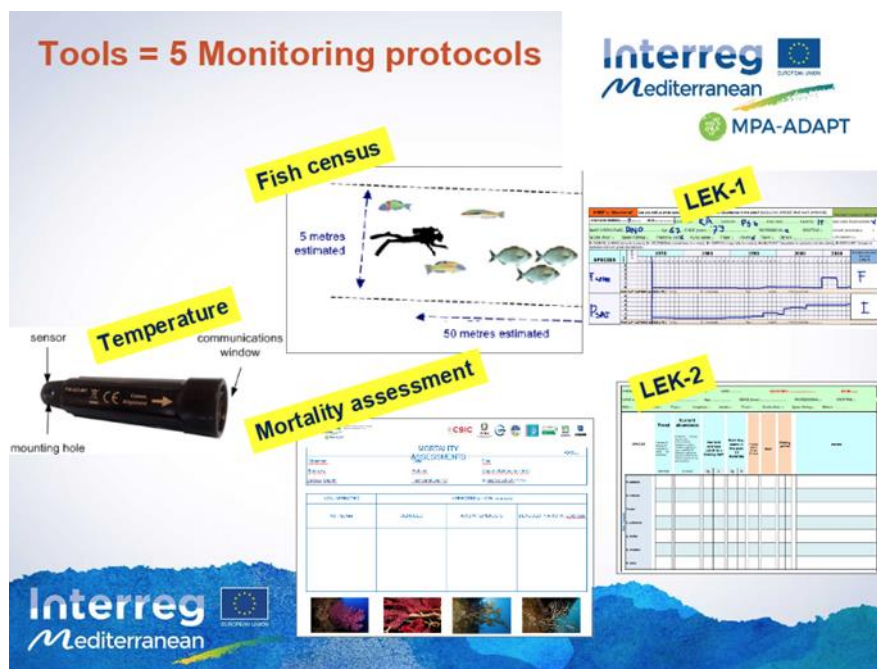


Image: Monitoring climate change in MPAs

The protocols built into these tools have been tested and implemented, providing results in (40+) different sites across the Mediterranean. They have also been adopted by international organisations such as UN FAO and UN RAC/SPA, which will contribute to their transferability and standardised use across Mediterranean MPAs. Through transferability, the Project seeks to contribute to advance the establishment of an effective sentinel network for climate change in the region.





## Management tools

### Governance strategy & action plan for banquettes & dune beach management

**POSBEMED** · Biljana Aljinovic, IUCN-Med

Project POSBEMED is addressing challenges and opportunities for the sustainable management of *Posidonia* banquettes and dune systems in coastal areas and beaches across the Mediterranean, focusing on strategy development and informing decision makers.

Although there is clear scientific evidence and consensus of the ecological role and relevance of *Posidonia* and dune systems, the lack of a consistent legal framework and existing social perceptions are preventing the sustainable management of these systems. The Project is therefore seeking to come forward with a Governance Strategy and Action Plan to address this challenge, by providing:

- > A Guide on existing methods and tools for the sustainable use of seagrass banquettes and associated dune systems.
- > A Toolkit with recommendations for the sound management of *Posidonia* and dune systems

## Geospatial tools

### AMAre WebGis

Project AMAre · Valentina Grande, CNR; Carlo Franzosini; Andrea Picciolo, Porto Cesareo PA

Project AMAre is working on developing shared methodologies, geospatial and management tools and pilot actions to coordinate strategies amongst MPAs in support of sound Maritime Spatial Planning (MSP) in these areas, helping MPA managers to address “hotspots” of conflict that require scientific-based, informed management decisions. The Project has delivered two specific tools:

- > AMAre Geodatabase & GIS Workflow, which support MPA managers in managing spatial data and information. The Geodatabase provides a common infrastructure across MPAs that facilitates the homogenisation and standardisation of data and indicators, as well as data integration, querying and manipulation. Formalised workflows are built into a Model Builder (ArcGIS), which are then available to the MPA manager.
- > AMAre Geoportal, which provides MPA managers, decision makers, scientists and citizens with a user-friendly platform for sharing spatial data and information. The Geoportal is an HTML5 application (ArcGIS server + Moka kit) that allows sharing, integrating and visualising data, printing maps, and other functionalities.



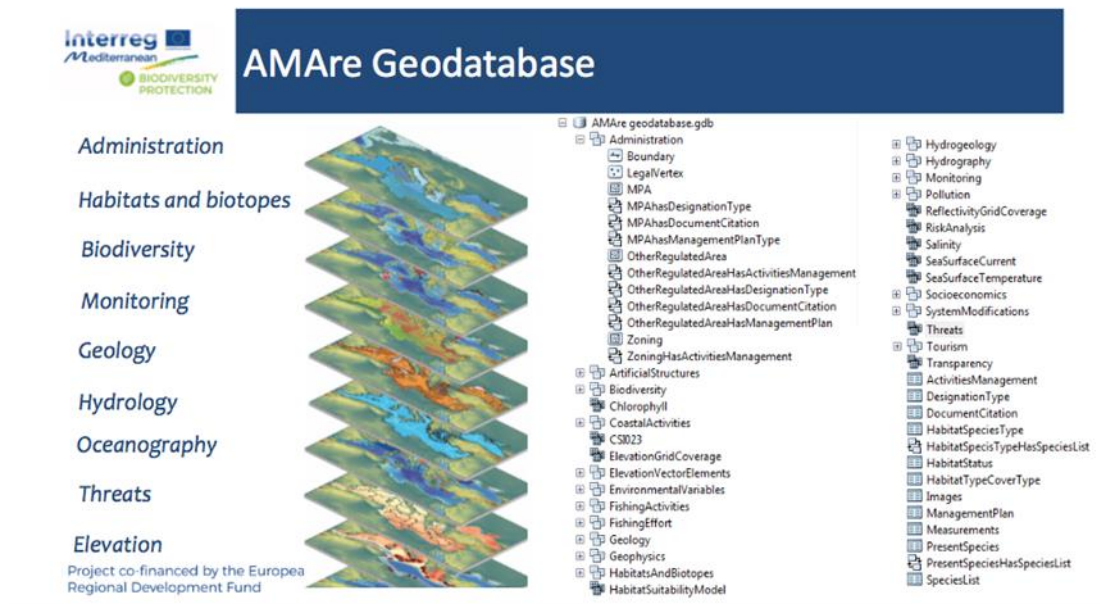


Image: AMAre Geodatabase

These tools are being tested in different MPAs, including **Torre Guaceto MPA (Italy)**, which is a useful case study to understand the possibilities offered by the use of these tools from a management perspective:

- > The management body of the MPA has observed a general pattern of regression of *Posidonia oceanica* along the Apulian coast. However, data suggest that this pattern of regression is higher outside than inside the MPA. Using AMAre's tools to guide the process, Torre Guaceto MPA is starting to include in their management plans *Posidonia* habitats of neighbouring Natura 2000 sites, both at the northern and southern external borders of the MPA. This will result in increased protection of the MPA, by improving the management and protection of these external areas.



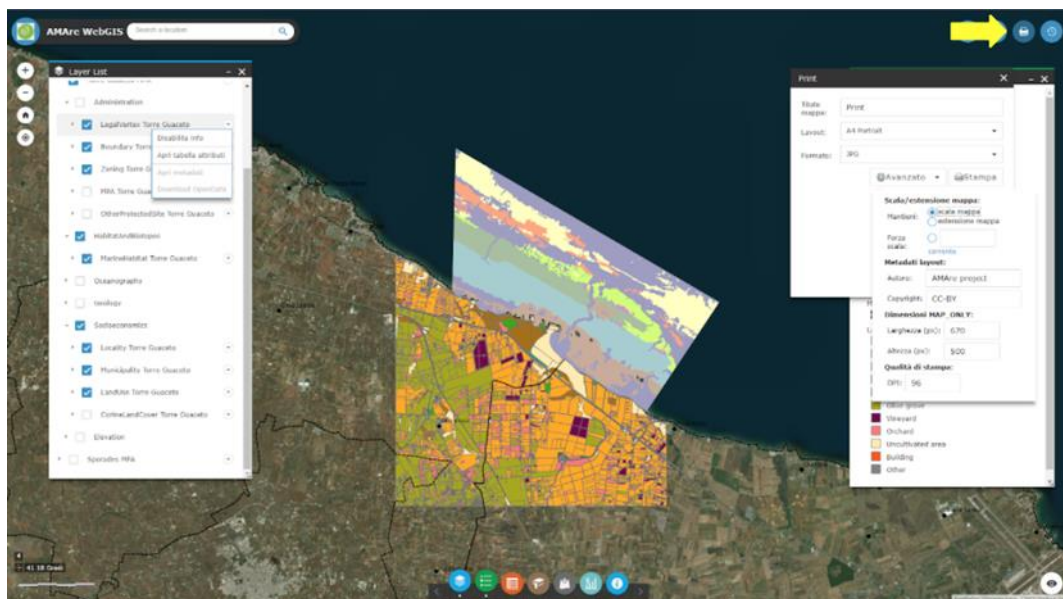


Image: AMArc Geoportal

- > Torre Guaceto MPA has also identified “hotspots” of conflict between current economic and social uses of the MPA and the protection of biodiversity in several areas, presenting critical challenges to an effective management of the MPA. This intense pressure has the potential of affecting services provided by existing ecosystems and habitats. In 2012-2013 the MPA launched the “S.A.M.P.E.I. project”, seeking to improve the selectivity of fishing gear in the MPA to by-catches and fish release by piloting and monitoring the use of 20-22-24 mm nets and evaluating their biological and economic impacts on professional fisheries. The results led to a second S.A.M.P.E.I. project in 2016, which focused on the use of 24 mm nets (further surveys are currently planned). Using the AMArc Geoportal and feeding on the data collected during the S.A.M.P.E.I. projects surveys, the MPA management body has been able to prepare graphs that reflect the anthropic pressure on the MPA habitats, expressed as a percentage of fishery effort, related to catch profitability. The resulting snapshot shows the strongest pressure (64% of the total) on the «coarse sands and fine gravels» habitats, even though the profitability (expressed as mean density of catch) attains the best performance in another habitat identified as «coralligenous - coarse and fine sands patches» (3.3% of fishery effort). This information will allow working with stakeholders to redistribute fishing efforts and work towards a win-win solution that delivers both on conservation objectives as well as on the profitability of the fisheries. This case study strongly supports the idea that data and geospatial tools are fundamental for effectively managing the “conflict of uses” zones in the single MPAs. Sharing data, experiences and practical applications to management challenges are key factors to improve the governance capacity of MPAs and beyond, generating a perspective of cooperative management.





## The MED Biodiversity Protection Community's knowledge sharing platform

**Project PANACeA** · Emanuele Mancosu / Sonsoles San Roman, ETC-UMA

Project PANACeA is a horizontal, capitalisation Project that seeks to capitalise on the results of all current MED financed Projects that are part of the MED Biodiversity Protection Community. The Project is working towards:

- > Synthesising outcomes on natural protection and biodiversity conservation efforts.
- > Engaging a stakeholders' community and transferring knowledge beyond the project's lifetime.
- > Implementing a communication and dissemination strategy.
- > Developing a long-term capitalisation Tool that supports evidence-based policy enforcement.

The MED Biodiversity Protection Community's Knowledge Sharing Platform is the capitalisation tool that will support evidence-based policy enforcement, bringing together all the relevant methodologies, tools and data stemming from the efforts of the Community into one single point of contact.

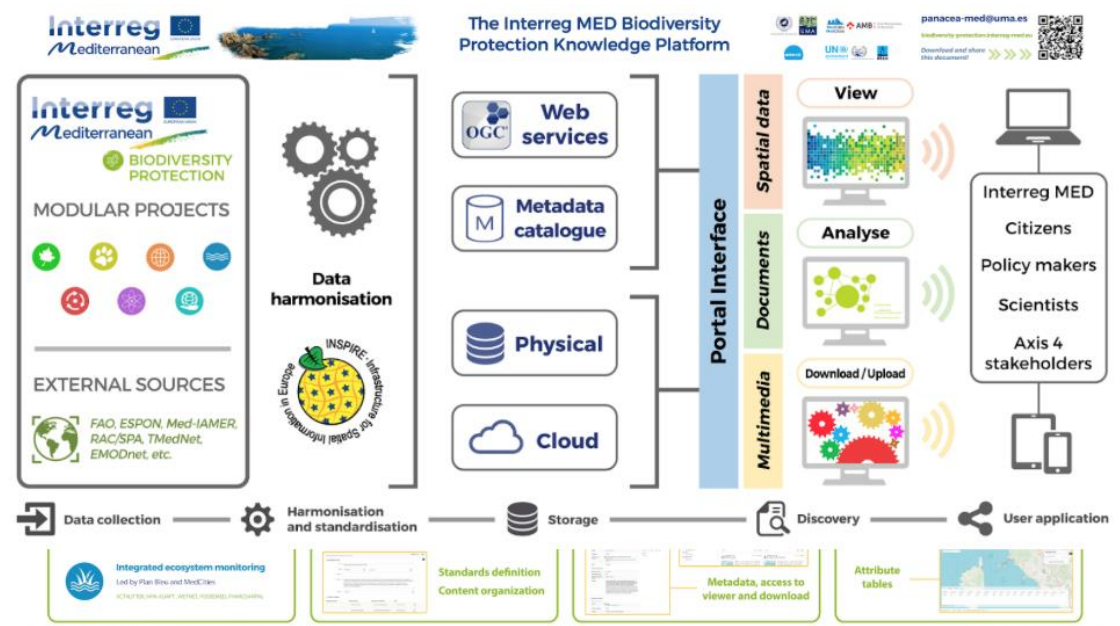


Image: Conceptual framework of PANACeA's Knowledge Platform

From a data perspective, the Platform is developed to spatially represent data and information generated by the modular 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 will include T-MEDNET, Med-IAMER and VLIZ, amongst others.







The infrastructure implementation and the data organisation is shaped to support the principles of the INSPIRE directive, SEIS and GEOSS:

- > Produce once, use many times.
- > Reduce efforts.
- > Avoid duplicated works.
- > Optimise efficiency.
- > Guarantee interoperability.
- > Envisage a long-term capitalisation tool for sharing evidence of Mediterranean Biodiversity protection efforts.

The Platform will use Metadata standards (such as ISO 19119/115), use existing thesauri to choose descriptive keywords (GEMET / INSPIRE / KEEP), establish a clear and sound data policy to ensure data ownership and observe OGC web standards (WMS, WMTS, etc.).

A Metadata catalogue will support the organisation of data information, making it possible to filter metadata elements (by topic, using keywords, resource contacts, etc.). A search engine will further facilitate a user-friendly approach to the exploitation of data and information.

The Platform will profile Partners of the MED Biodiversity Protection Community and provide access to all relevant Project results, products and available documentation. As one of its key features, the Platform will be able to combine the geospatial data produced by other portals and initiatives of the Community, with full reference and linkage to each data source. The resulting information will be able to feed into policy processes and/or other research Projects looking at different research questions that would have otherwise not been addressed by the Projects of the Community within their own scope of action.

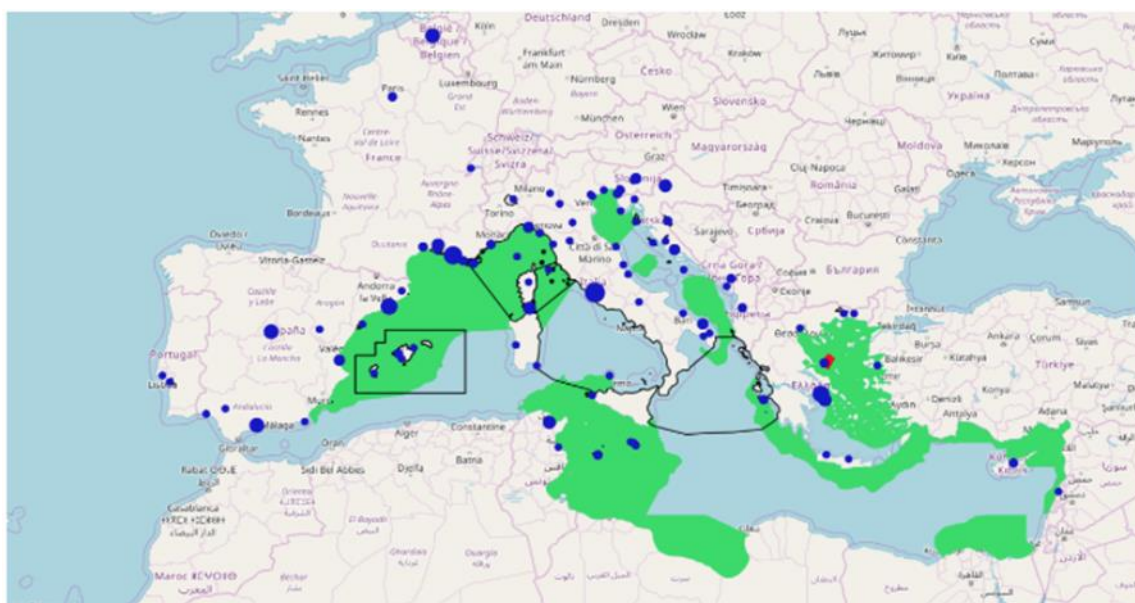


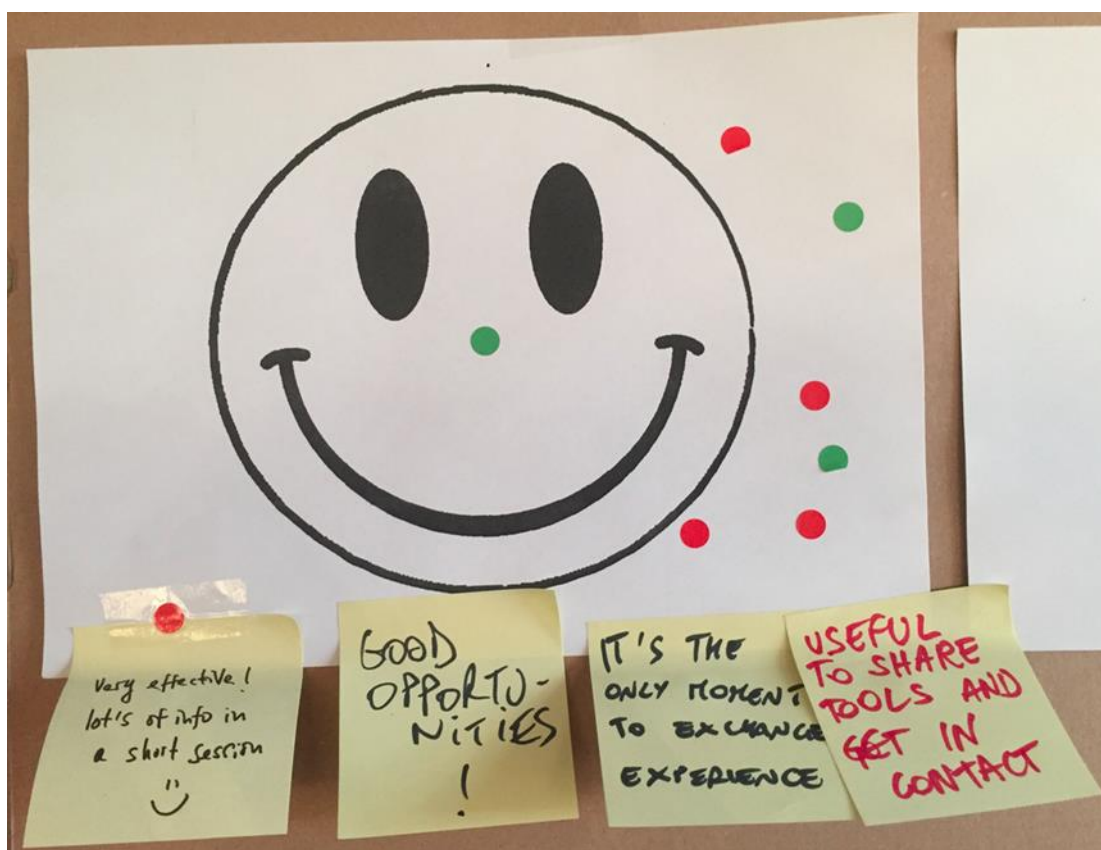
Image: Geographical distribution of Partners to the EU MED Biodiversity Protection Community and EBSA



## Annex: additional material

- > [Presentations delivered by participants](#)
- > [Photo Gallery](#)
- > Feedback provided by participants on the interactive session:

After the interactive session held within the Event, participants were asked to provide feedback on the perceived usefulness of the session and whether they would be interested in repeating a similar initiative in future Knowledge Sharing Events and/or Community Building meetings. There was full consensus that exchanging information on Tools being developed by the Projects of the Community was extremely useful and desirable, and that such an initiative would be again very much welcomed in the near future.

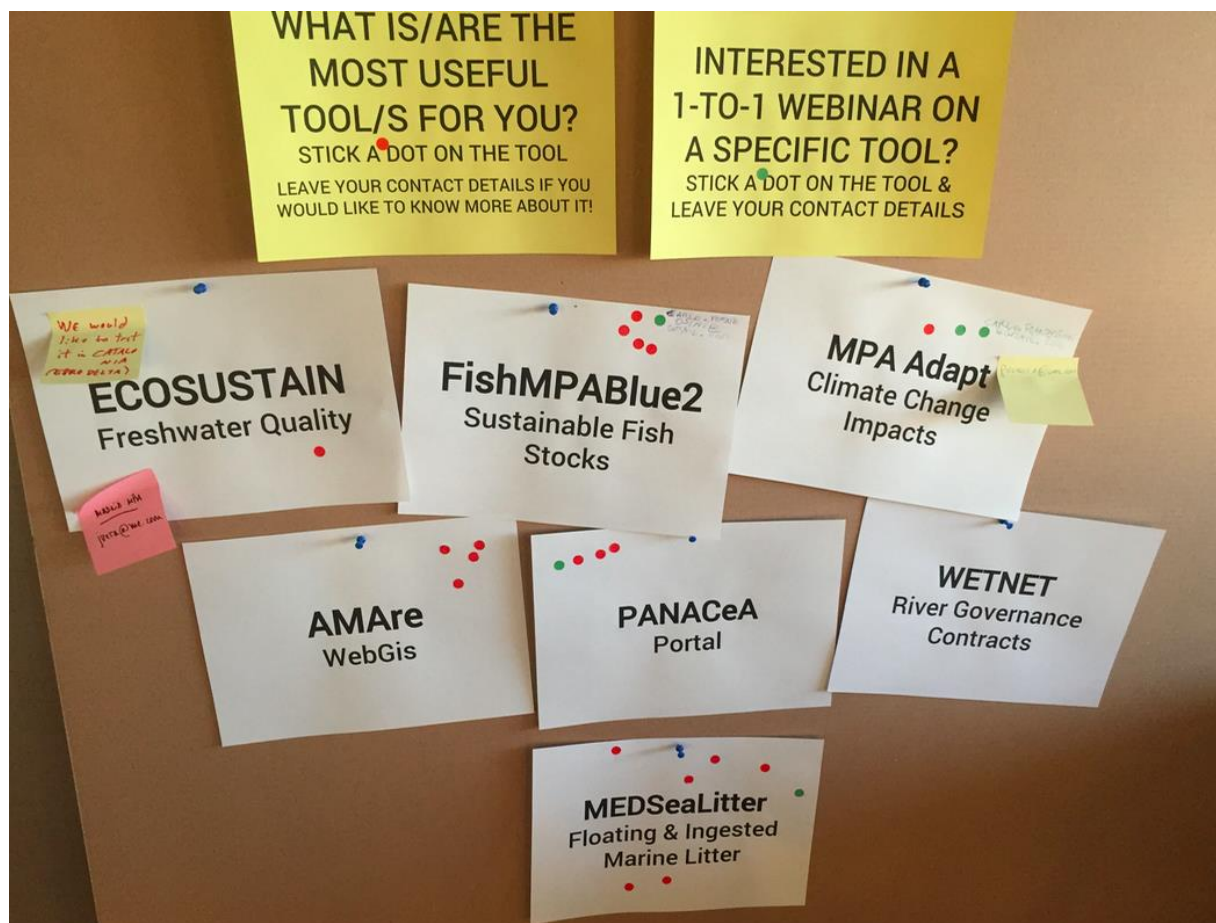




Representatives of the Government of Catalonia expressed their interest in exploring opportunities to apply Project ECOSUSTAIN's tool for monitoring freshwater quality in the Ebro Delta.

Participants were also asked to express their preferences regarding the possibility of having one-to-one webinars on any of the Tools featured during the session, so as to further explore potential synergies and transferability opportunities. The following Tools were prioritised by participants for future action in this direction:

- > Project FISHMPABLUE2's Governance Toolkit For Sustainable Fish Stocks
- > Project MEDSEALITTER's methodology for monitoring floating and ingested marine litter
- > Project MPA-ADAPT's protocols to support climate change monitoring in MPAs
- > The MED Biodiversity Protection Community's Knowledge Sharing Platform





## The MED Biodiversity Protection Community featured by PANACeA

MED Biodiversity Protection Community brings together a comprehensive network of experts from public & private institutions actively working to protect biodiversity and natural ecosystems in Mediterranean Protected Areas. Filling the current gap between Science, Management, and Policy is one of the priority targets of the Biodiversity Protection Community.

The Biodiversity Protection Community seeks to identify and generate synergies amongst the work of relevant Mediterranean stakeholders, including Protected Area managers, policymakers, socio-economic actors, civil society and the scientific community. 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 of the 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.

PANACeA supports the MED Biodiversity Protection Community by:

- > Offering support as well as communication and capitalisation opportunities to the MPs.
- > Seeking interconnectivity amongst MPs and offering networking opportunities.
- > Helping MPs achieve their results by creating opportunities to exchange and transfer methodologies, tools, practices and knowledge.
- > Ensuring adequate deployment of the activities, services, and tools it develops by involving its Advisory Board throughout the project lifetime.
- > Mobilising experts from outside the MED Programme, especially from the Eastern and Southern Mediterranean region, who focus on biodiversity protection, in order to make possible communication with a wider community of experts and a broader dissemination of the Community's results.
- > Building upon the individual projects' needs to create a unique and adapted tool, the MED "Biodiversity Protection Knowledge Platform" (BPKP), as both a community building and a long-term capitalisation tool that allows a one-entry-point access to all the knowledge generated by the biodiversity protection community.

The community's Open Seminars / Knowledge Sharing & Community Building meetings are amongst the key tools that have been devised to achieve the above-mentioned objectives. Open Seminars are knowledge-sharing events that seek to share information, advance knowledge, and enhance collaboration on relevant topics amongst Community members, also engaging stakeholders and experts outside the Community







<https://www.facebook.com/PanaceaInterregMed/>



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