



AMAre Actions for Marine Protected Areas

Biodiversity Protection

GUIDELINES & RECOMMENDATIONS BOOKLET
DELIVERABLE 5.1.1 & 5.2.1 "Transferring of Best Practices
across MPAs and at Transnational Scale"

AMAre

Actions for Marine Protected Areas

Interreg Med Programme (2014-2020)



AMAre

Actions for Marine Protected Areas

<https://amare.interreg-med.eu/>

Deliverable numbers: 5.1.1 & 5.2.1

Transferring of Best Practices across MPAs

Transferring of Best Practices at Transnational Scale

Priority Axis 3: Protecting and promoting Mediterranean natural and cultural resources
Specific Objective: 3.2, to maintain biodiversity and natural ecosystems through
strengthening the management and networking of protected areas
Work Package Number: 4

Authors: Frascchetti S., La Marca E.C., Foglini F., Grande V., Azzellino A., Benedetti Cecchi L., Brodersen M., D'Ambrosio P., De Franco F., Deidun A., Drago A., Gadolou E., Galgani F., Garcia Rubies A., Kikeri M., Kouroutos V., Lanfredi C., Lecci R., Macpherson E., Maina I., Maniopoulou M., Pantazi M., Picciolo A., Poursanidis D., Rindi L., Vassilopoulou V.

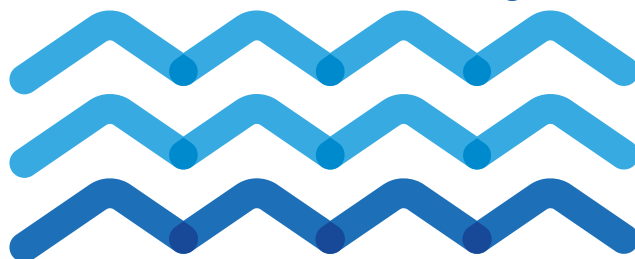
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Chapter 1-

AMAre, The Project



1. Introduction

Marine Protected Areas (MPAs) are crucial for the conservation of the Mediterranean Sea, since they protect biodiversity and regulate human activities. However, many species and habitats within MPAs are still exposed to a variety of pressures. In most MPAs human activities are not spatially managed and the effectiveness of protection is not systematically monitored.

The intensive use of maritime space and resources calls for integrated actions aimed both at reducing the overexploitation of the natural capital and at mitigating the effect of cumulative human pressures.

A scarce consideration into management plans of a systematic assessment of the effect of human activities still persists in the Mediterranean, although many EU policy frameworks clearly claims for a systematic monitoring of biological and environmental changes within and outside the Mediterranean MPAs by a coordinated approach among the member states.

AMAre is a project co-financed by the Euro-

pean Regional Development Fund through the **Interreg Med Programme** (2014-2020, Priority Axis 3: Protecting and promoting Mediterranean natural and cultural resources). It is led by the National Inter-University Consortium of Marine Sciences (CoNISMa) and includes eleven partners from five Mediterranean countries: Italy, France, Greece, Spain and Malta.

The **aim** of this project is to introduce common strategies to monitor and manage biodiversity and marine resources, capitalizing on the indications of EU Directives and on the close collaboration between research scientists and the MPA Management Bodies.

Such an integrated framework is fundamental for the adoption of an ecosystem-based approach leading to the design of **recommendations** for the spatial management of multiple human uses and the achievement, at transnational level, of the EU legislation goals (e.g the Marine Strategy Framework and Maritime Spatial Planning Directives).

2. Aims of the project

Nowadays, the implementation of well managed **networks of MPAs** is instrumental to maximize the positive effects of protection on **biodiversity** and is recommended by a number of EU policies (the Convention on Biological Diversity, 1992; The Millennium Development Goals, 2000; The Aichi Target 11, 2010; the MSFD Directive 2008/56/EC amended 2017/845/EU). However, in the Mediterranean the institution of MPA networks is still at the beginning.

The specific objective of AMAre is to find common strategies for improving current management and protection measures in the Mediterranean Sea, in order to support the implementation of MPA networks able to handle the effects of multiple stressors in a Maritime Spatial Planning (MSP) perspective.

In detail, the aims of AMAre are:

- to develop a **geospatial tool** to exchange information among MPAs on biodiversity distribution and status, with a focus on vulnerable habitats of EU importance (e.g. coralligenous formations and *Posidonia*

oceanica meadows), environmental variables, human pressures distribution and intensity;

- to adopt EU **protocols** for ecological monitoring, allowing the collection and the comparison of fine-scale ecological data among different MPAs;
- to develop **guidelines** for the assessment of early warning indicators of regime shift for monitoring the risk of collapse of benthic ecosystems;
- to develop concrete **pilot actions** in selected MPAs to assess the condition of specific descriptors of good environmental status (GES);
- to refine a **general framework** for the management of MPAs (the ISEA scheme "Standardized Interventions for the Effective Management within MPAs");
- to suggest **coordinated strategies** to solve hot-spots of conflict affecting marine biodiversity and services;
- to enhance **stakeholder involvement** for the co-management of natural resources.
- to support the **30%-by-2030 IUCN Goal**, a new target of conservation which aims to

the effective protection of the 30% of each marine habitat through MPAs and other effective area-based conservation measures by 2030.

This **booklet** aims to share the main project

achievements and to promote at trans-national scale **guidelines and recommendations** for the implementation of networks of MPAs.

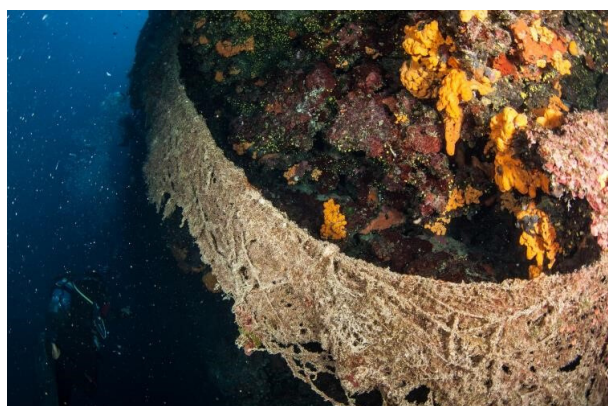
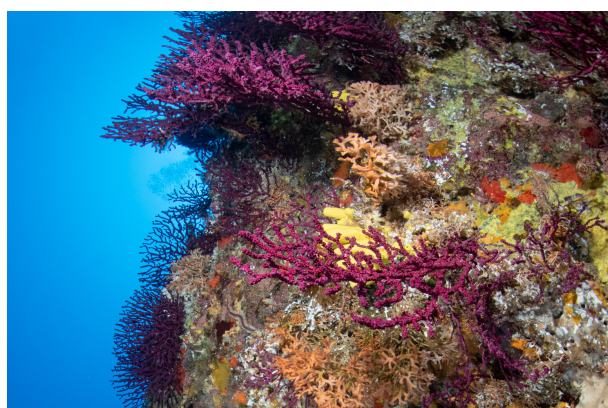


Figure 1, Coralligenous formations and *Posidonia oceanica* meadow under undisturbed (above) and threatened conditions (below). Photographer: D. Poursanidis.

3. List of Partners

1. National Inter-Universities Consortium for the Marine Science – CoNISMa (Italy)
2. Euro-Mediterranean Centre on Climate Change - CMCC Foundation (Italy)
3. National Research Council, Institute of Marine Science – CNR-ISMAR (Italy)
4. University of Malta (Malta)
5. Spanish National Research Council - CSIC (Spain)
6. Hellenic Centre for Marine Research HCMR (Greece)
7. French Research Institute for Exploitation of the Sea - IFREMER (France)
8. Management Consortium of Torre Guaceto (Italy)
9. Management Consortium of Porto Cesareo (Italy)
10. Management Body of The National Marine Park of Alonissos Northern Sporades (Greece)
11. Regional Government of the Balearic Islands (Spain)



GOVERN
ILLES
BALEARS



4. Marine Protected Areas of AMAre

Five Mediterranean MPAs are directly involved in AMAre, for the implementation of pilot activities.

- Torre Guaceto MPA

It is located in the south-eastern Italy and covers a total surface of about 2212 ha. This MPA, which is also a SPAMI area, has been established in the 1991 with high involvement of the socio-economic actors of the area. This MPA is an excellent example of co-management with significant positive effects on biodiversity and relevant economic benefits for local activities, representing a model of sustainable fishery with systematic improvements of its governance.

- National Marine Park of Alonissos Northern Sporades (NMPANS)

The NMPANS is the first Greek MPA, established in 1992 and the largest MPA in Europe. It is located in the north-west of the Aegean Sea and covers an area of approximately 220000 ha. The Park includes the island of Alonissos, six smaller

islands and twenty-two rocky outcrops.

It is well known for the presence of important habitats and species, as the monk seal *Monachus monachus* and hosts a unique underwater archaeological site dating back to the prehistoric era.

- Freus d'Eivissa i Formentera Marine Reserve (FEFMR)

It is located between Ibiza and Formentera (north-west Mediterranean) and it is the second largest of the eleven Balearic Marine Reserves, covering ca. 15378 ha. It was instituted in 1999 and it is managed by the Balearic Islands Government, in order to maintain the good ecological status of marine habitats and communities and to enhance a sustainable small-scale fishery.

- North-East MPA of Malta

The "Żona fil-Baħar bejn Il-Ponta ta' San Dimitri (Għawdex) u Il-Qaliet" was designated as a Special Area of Conservation of International Importance (SPAMI) by the Environment and Resources Authority (ERA) and as a NATURA 2000 site

(MT 105) through the EU Habitats Directive by virtue of the habitats and species it hosts. The MPA extends for 15915 ha, including the north-eastern coast of Malta, from St. George's Bay to Ċirkewwa, the coast of Comino and the eastern coast of Gozo from Hondoq Ir-Rummien to Xwejini Bay. This MPA hosts more than 80% of the *Posidonia oceanica* meadows found in the Maltese Islands.

- Porto Cesareo MPA

It is located in the northern Ionian Sea, extending for 16741 ha. It was instituted in 1997. This MPA is characterized by sandy beaches alternated with shallow rocky coasts and many small islands. High coverage of *P. oceanica* meadows with three Sites of Community Interest, within the MPA, coralligenous formations and underwater caves are three characteristic habitats of this MPA, included in the SPAMI protocol.

The MPA is developing many interventions to deal with the manifold human activities (legal and illegal), improving the conservation status of an area that can be considered a real hub of biodiversity.



Figure 2, AMAre MPAs. From the top: Torre Guaceto MPA, NMPANS, FEFMR, N-E MPA of Malta and Porto Cesareo MPA. Pictures from: <https://amare.interreg-med.eu/our-story/when-where/>.

Chapter 2-

Project achievements



Project achievements

Creation of a Spatial Geoportal

It is a web-based platform dedicated to multidisciplinary spatial data that can be stored and shared among the project partners and the MPA managers. This tool allows the visualization of different spatial thematic layers integrated in the geodatabase, including the results of monitoring and pilot activities carried out during the project. The thematic layers are available also as OGC services making the geoportal interoperable with other Spatial Data Infrastructure. The Geoportal will be adopted by other InterregMed projects and Mediterranean MPAs for sharing their data.

Use of common monitoring protocols

Considering the MSFD instructions, standardized methods for the monitoring of specific GES descriptors (e.g. *P. oceanica* meadows, coralligenous formations, rock-subtidal benthic assemblages and marine litter) within and outside the MPAs included in the project have been adopted by all the partners, stressing the importance of considering the context in which each MPA is embedded.

Implementation of pilot activities

The collection of fine-scale ecological data within and outside the MPAs showed positive effects of protection on the biodiversity, but also evident signs of disturbance. Fine-scale information is critical to refine the management plan of the MPAs where degraded habitats have been found, planning new actions to support the recovery of disturbed ecosystems.

Production of technical reports

Guidelines for the monitoring of marine litter, on the evaluation of ecosystem services and of early warning of change of macroalgal forests and seagrass meadows within the MPAs have been produced, with high interactions among the partners and with other projects. The marine litter monitoring protocol has been integrated in the MSFD guidance and it is promoted as official guideline.

Project achievements

Implementation of the ISEA framework

The adaptation of the ISEA framework to all the MPAs involved in the project was a real challenge, considering the high ecological and socio-economic heterogeneity among MPAs. This achievement is a starting point to extend the ISEA management framework (and a possible evolution) to other Mediterranean MPAs.

Assessment of land-sea interactions

AMAre showed the importance to analyze the effect of land-based activities on coastal areas to better characterize potential drivers of change in the marine ecosystems. An appropriate monitoring system within the MPAs can not disregard the land-sea interactions due to socio-economic activities and bio-geochemical processes (e.g. pesticides).

Improvement of current management

Strategies for improving the conservation and the management of marine resources in areas outside present MPA boundaries have also been implemented. How to improve the management of an area has

been discussed with target groups both in Malta and in Torre Guaceto. In Torre Guaceto an important outcome of the project was to provide support to the initiative to include the Special Area of Conservation outside the MPA's boundaries to the management of the MPA.

Stakeholder involvement

Several events engaging key stakeholders at the local, national and regional level (e.g. Environmental Policy makers, Regional Authorities, MPA officials, fishermen, diving centers, tourism representatives) have been organized by the project partners to increase the public awareness on conservation and to include their opinion for enhancing current protection measures and the sustainable use of marine resources through the exchange of information.

Project achievements

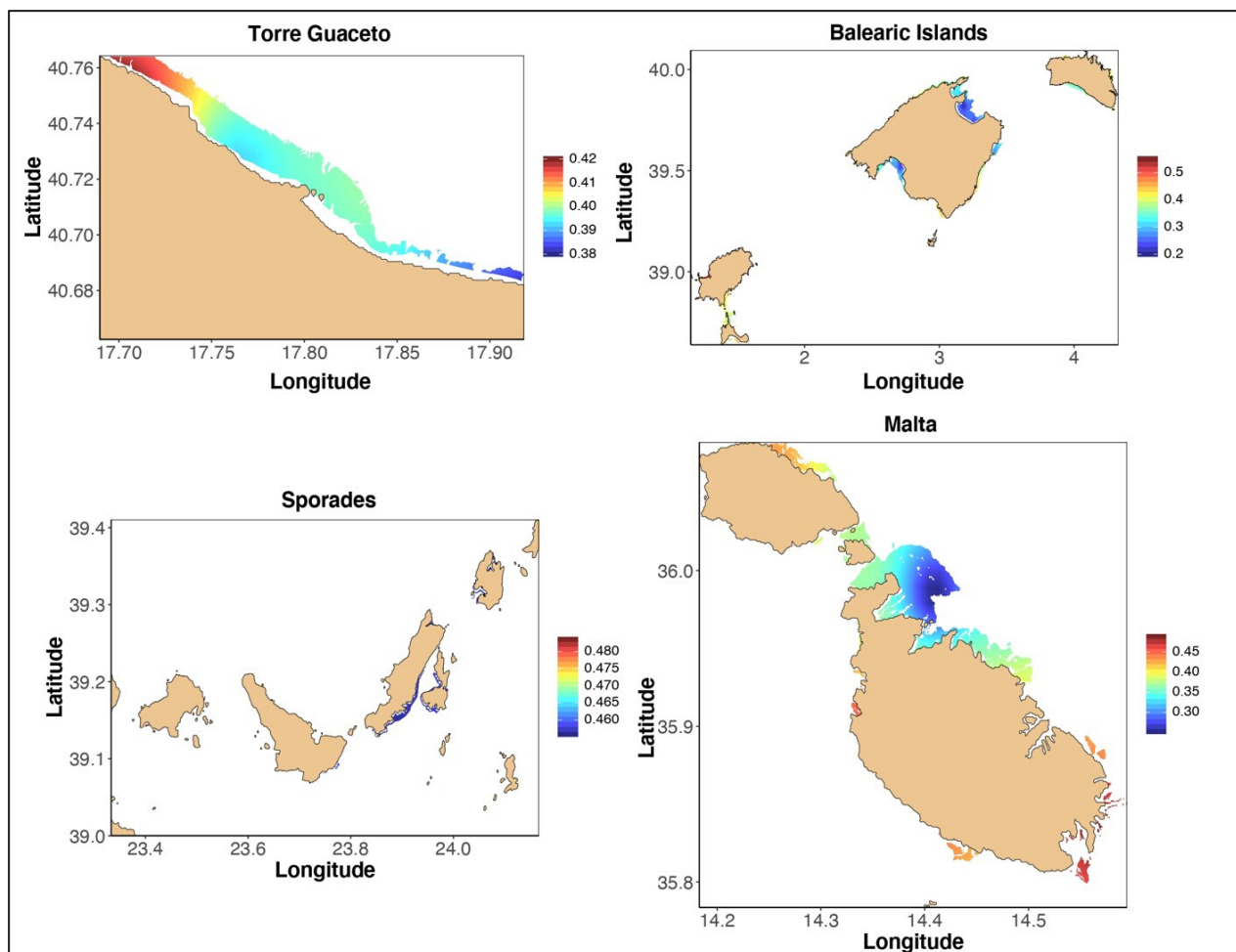


Figure 3, Probability of collapse of *Posidonia oceanica* in the four MPAs. Probabilities are obtained assuming a threshold for collapse of 75% of canopy loss compared to a fully vegetated meadow.

Chapter 3-

Guidelines and Recommendations



Guidelines and Recommendations

1

Fine scale data on biodiversity within and outside MPAs are needed to assess their performance to reach biodiversity targets.

Little is known on whether management measures are implemented in a large proportion of MPAs and if they are, whether they are effective to reach stated conservation targets.

Good ecological and environmental data collected at appropriate spatial and temporal scales are simply missing.

More investments are needed on mapping the distribution and status of ecosystems, habitats and species and setting observation platforms to improve our knowledge of biodiversity, abiotic variables and ecosystem functioning. Monitoring only inside MPAs is not enough.

AMAre introduced new knowledge about the status of several habitats under protected versus non-protected conditions with a full recognition of the importance of the context in which each MPA is implemented.



Figure 4, Habitats of community interest for conservation monitored at the AMAre study sites (above: coralligenous formations; below: *P. oceanica* meadow). Picture source: <https://amare.interreg-med.eu/our-story/when-where/>.

Guidelines and Recommendations

2

Systematic reporting about human uses and refinement of threat assessments within and outside MPAs will enhance management and conservation capacity.

A **fine scale mapping** of human pressures inside and outside the MPAs is also critically necessary to design measures, define priorities, and take decisions with respect to local needs to maintain the GES of protected biodiversity.

AMAre is showing that the achievement and maintenance of good ecological conditions requires fine-scale data of human activities and their ensuing pressures to marine ecosystems.

Cumulative effect assessment models could be of crucial help only if based on sound and representative data linking the status of ecosystems to the cumulative level of human pressures.

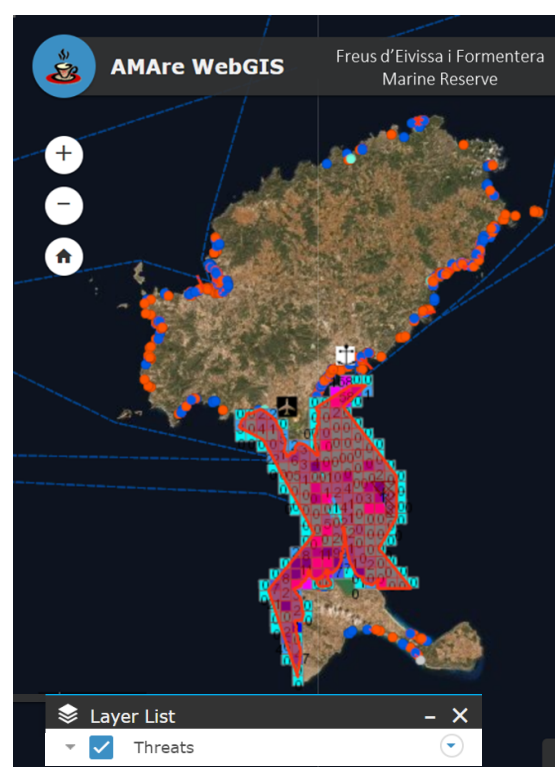
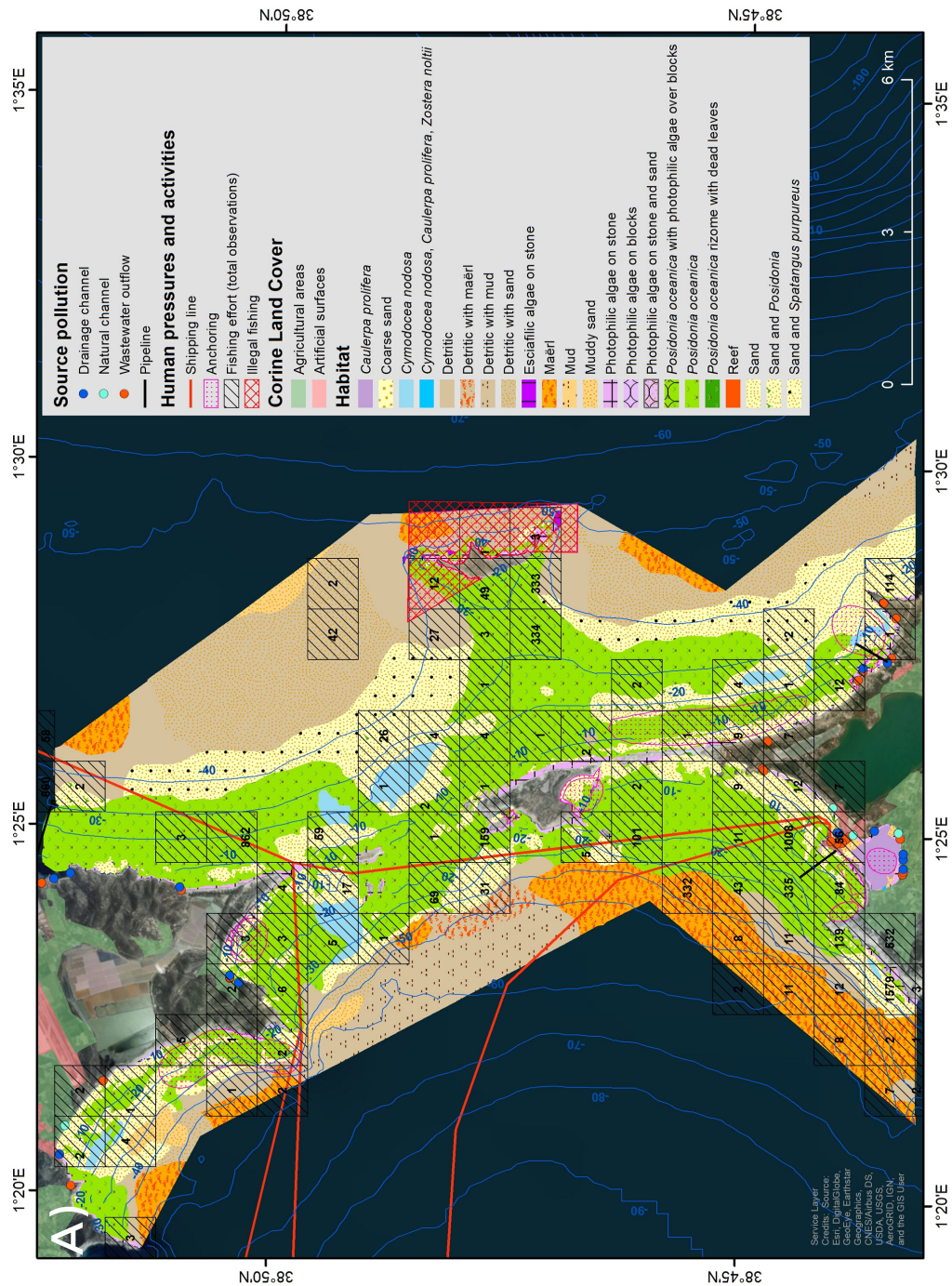


Figure 5, Map showing fine-scale information of human pressures at the Freus d'Eivissa i Formentera Marine Reserve. Source: <https://amare.interreg-med.eu/toolbox/geoportal/>.

Guidelines and Recommendations



Station

- AMare
- ARPA Puglia
- Emergelica

FishingActivity

- Fishing area (N° of points)
- Fishing zone

Habitat

- Coralligenous
- Coralligenous and coastal detritic bottom
- Coralligenous and coastal muddy detritic bottom
- Coralligenous and Posidonia oceanica
- Hard substrate and Posidonia oceanica
- Infralittoral algae
- Infralittoral algae and Posidonia oceanica
- Posidonia meadow
- Posidonia oceanica on mat
- Matte and sand
- Well sorted fine sand community

AnthropogenicActivityAndStructure

- Discharge
- Recreational cave visit
- Parking area
- Railway line
- Trekking

HumanFrequency

- Intensity
- High
- Medium
- Low

CorineLandCover

- Level 1
- Agricultural areas
- Artificial surfaces

HydroPunctalObject

- HydroPunctalObject

HydroLinearObject

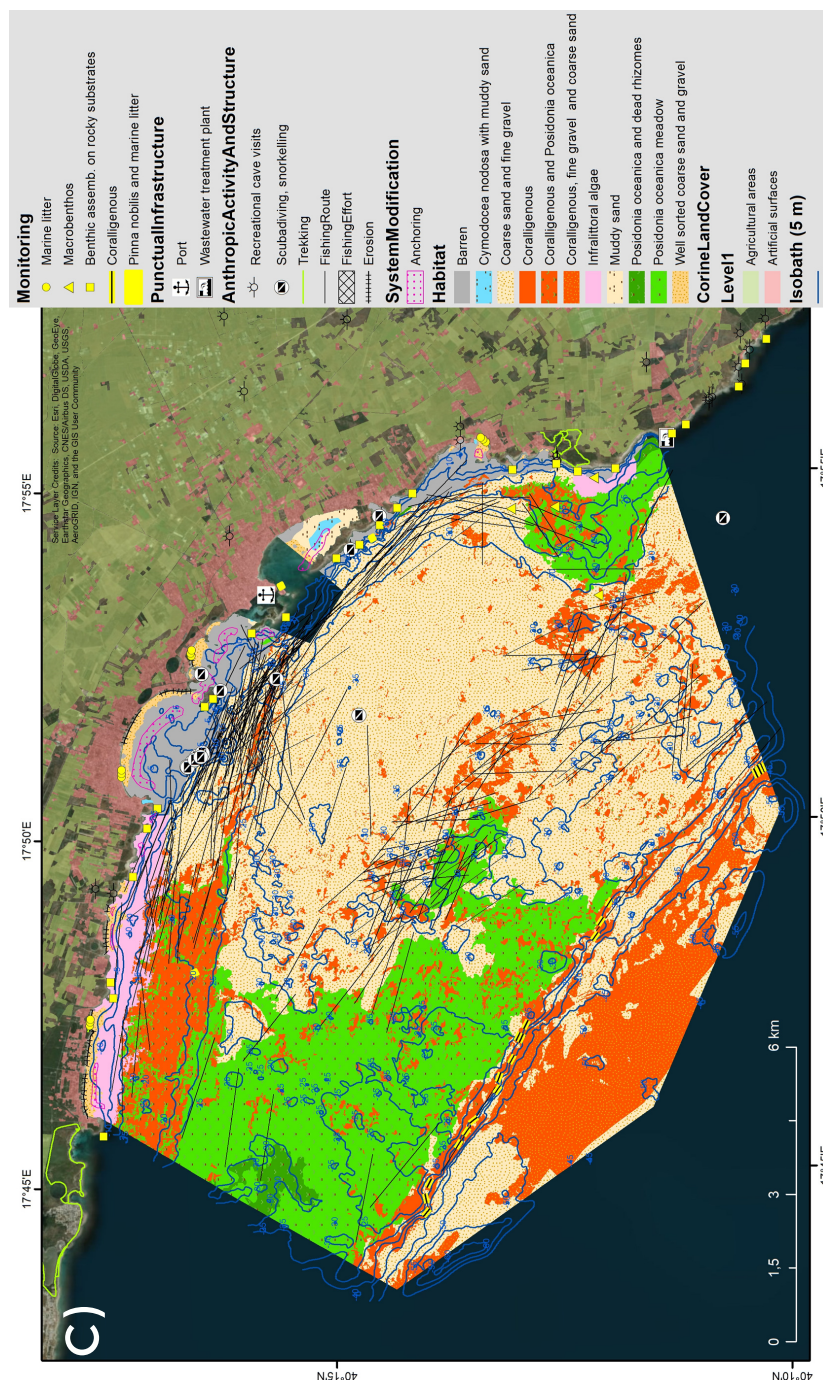
- Isobath (5m)

Erosion

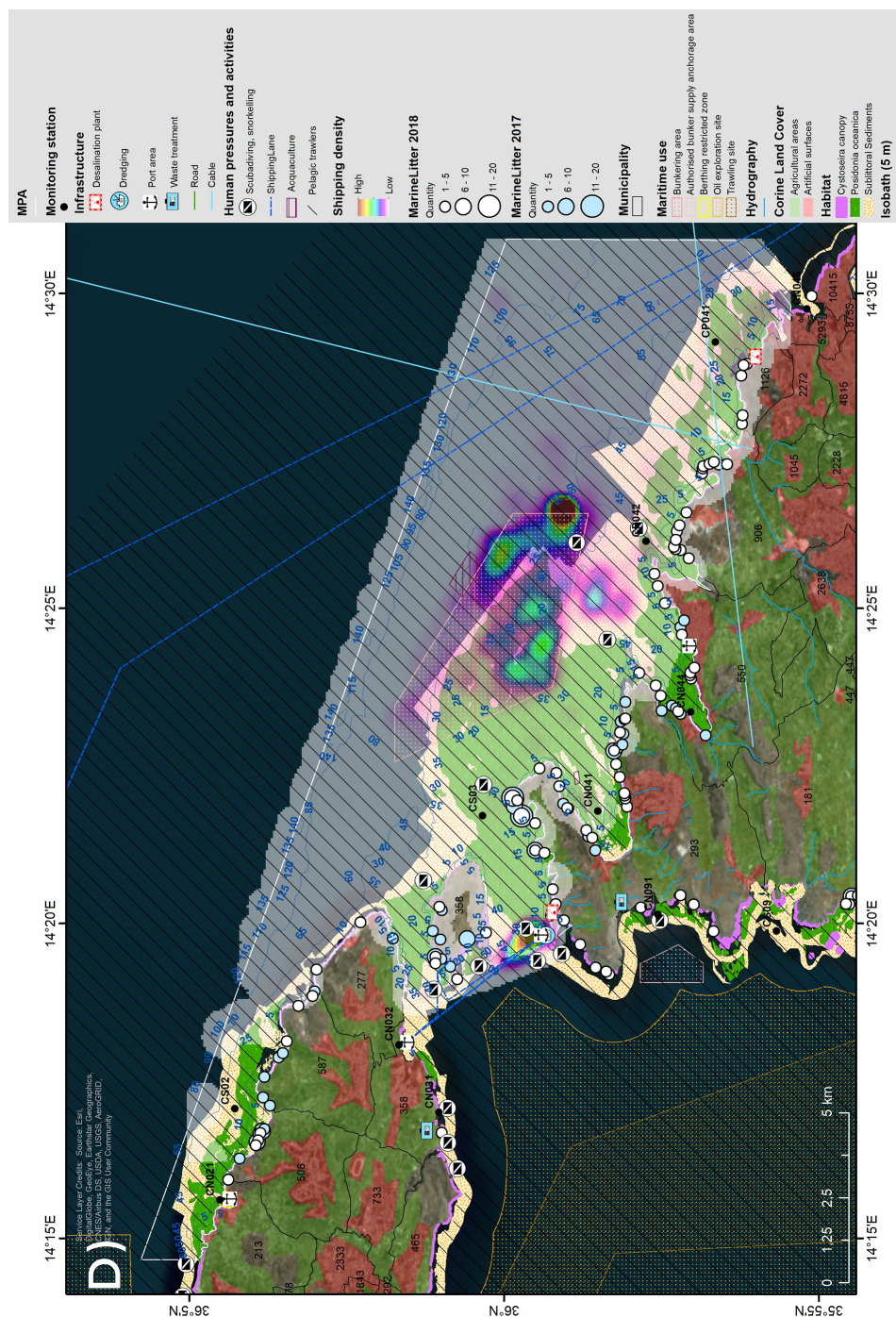
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- +++
- ++++

Map Labels: M1, M2, M3, P1, P2, P3, Q1, Q2, Q3, 350 cars, 120 cars, 8 km, 0, 2, 4, 6, 8 km, 17°42'E, 17°45'E, 17°48'E, 40°42'N, 40°45'N, 40°48'N.

Guidelines and Recommendations



Guidelines and Recommendations



Guidelines and Recommendations

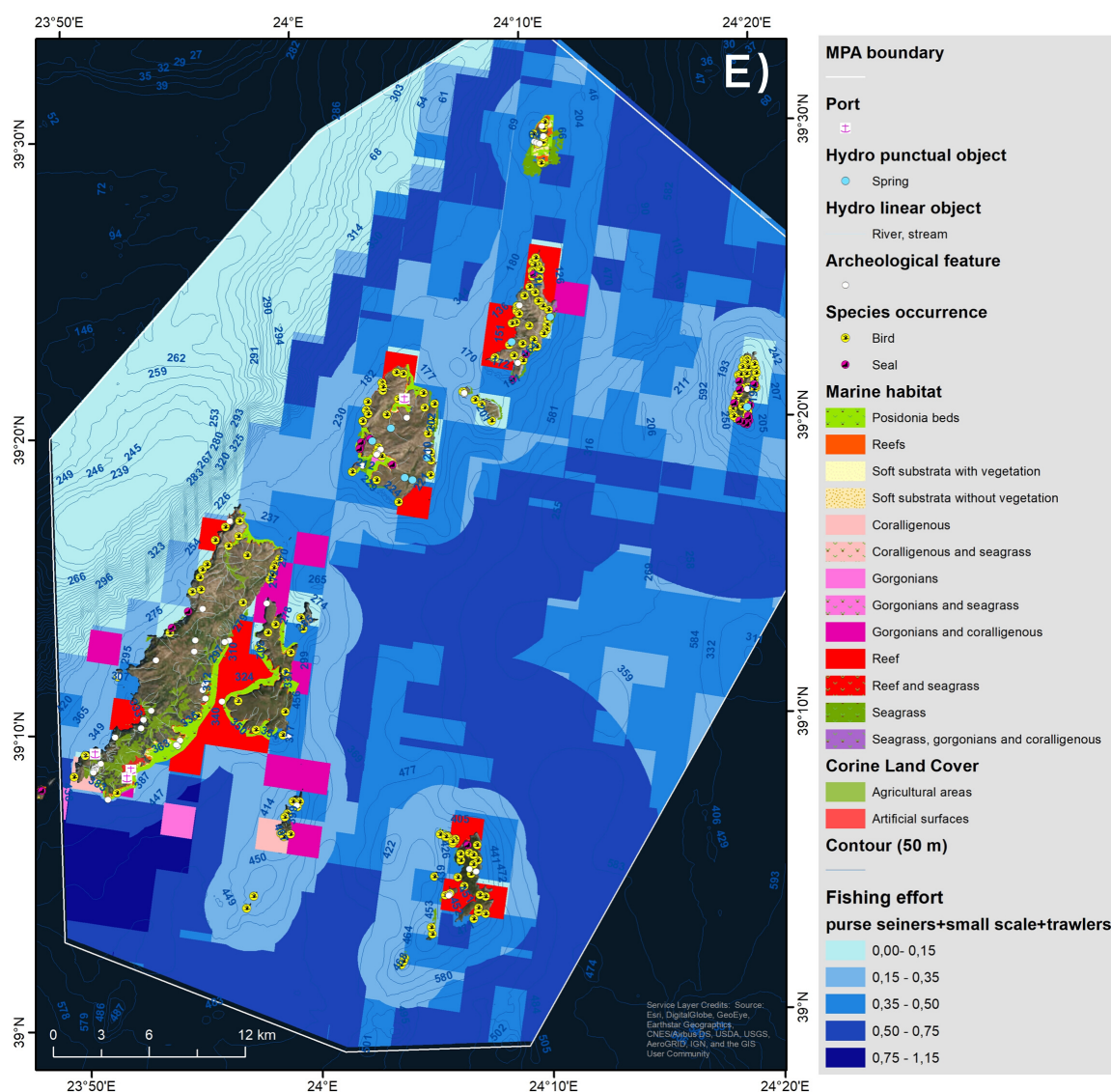


Figure 6, Multiple-layer maps showing the distribution of habitats and human pressures at the AMAre study sites. A) Freus d'Eivissa i Formentera Marine Reserve; B) Torre Guaceto MPA; C) Porto Cesareo MPA; D) Maltese MPA; E) National Marine Park of Alonissos Northern Sporades. Source: <https://amare.interreg-med.eu/toolbox/geoportal/>.

Guidelines and Recommendations

3

Implementation of integrated land-sea conservation and management.

An integrative approach should be adopted when managing MPAs.

Integrated conservation planning allows to meet conservation targets more efficiently, to account for human activities occurring on land affecting marine habitats. AMAre showed the importance of assessing **land-sea interactions** for the implementation of effective management plans.

4

MPA managers should better coordinate their activities across MPAs.

At present, a real coordination among MPAs is rarely occurring while synergies in management, monitoring and conservation tools across MPAs represent an opportunity to better manage human pressures in all marine spaces simply using current legislation.

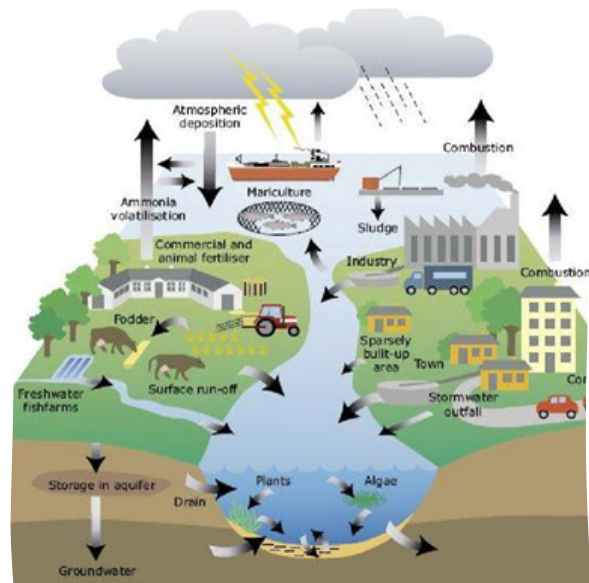


Figure 7, Schematic representation of the complex land-sea interactions. Source: European Environmental Agency (www.eea.europa.eu/).

Despite success stories are surely ongoing, AMAre showed the difficulties in the interactions with and among Management Bodies. More interactions are needed to put in place more robust **collaborative framework**.

Guidelines and Recommendations

5

MPA managers must work closely with other actors that use space in the proximity of their MPAs, with effects on the status of biodiversity within their MPA.

This calls for effective implementation of all environmental legislations, such as the Birds and Habitat Directives, the Marine Strategy Framework Directive, and the Maritime Spatial Planning, at all relevant scales.

AMAre showed the importance of starting a dialog with different **stakeholders** for extending governance models and conservation measures also to Sites of Conservation Interest/ Special Areas of Conservation which often are external to the MPAs and totally lack a management plan. This should be achieved with appropriate funding to make effective these interventions.

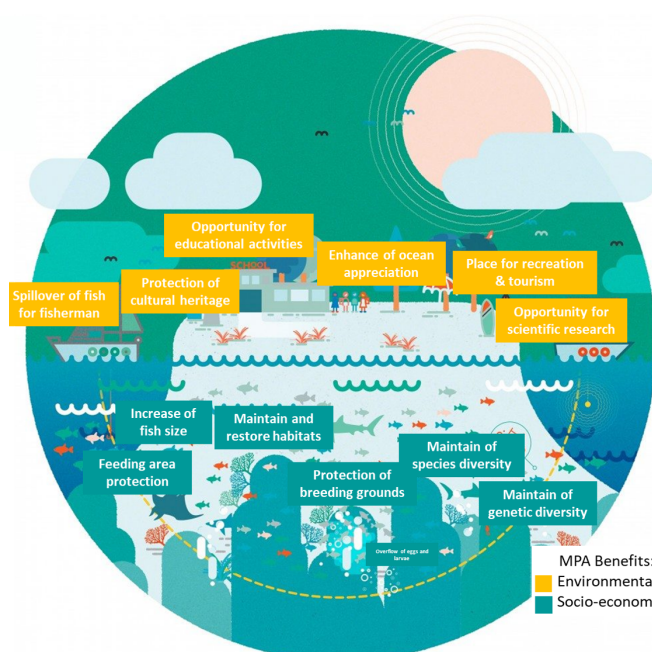


Figure 8, Environmental and socio-economic MPA benefits. From: <https://www.saveourseasmagazine.com/marine-protected-area/>.

Guidelines and Recommendations

6

Improving data availability and accessibility.

Coordinated monitoring and management require coordinated data collection and a common data infrastructure to ensure that effectively accessible and comparable information is shared across managers and policy makers, but also with the public, supporting the production of consistent evidence-based messages valuable for different stakeholders.

The **Spatial Geoportal** developed in AMAre goes in this direction. The AMAre approach consists of building a common and standardized relational spatial database. The AMAre Geodatabase collects and manages in a coordinated manner all the spatial data and the related information. Using this tool, all MPA managers speak the same standardized language and for the first time, they can access the available information in the area of interest and in the other MPAs.

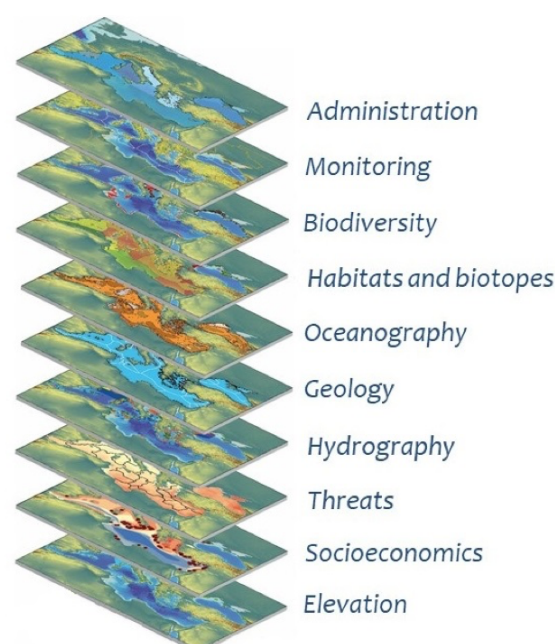


Figure 9, Thematic layers stored in the AMAre Geodatabase following the INSPIRE Data Model. Source: CNR-ISMAR.

Guidelines and Recommendations

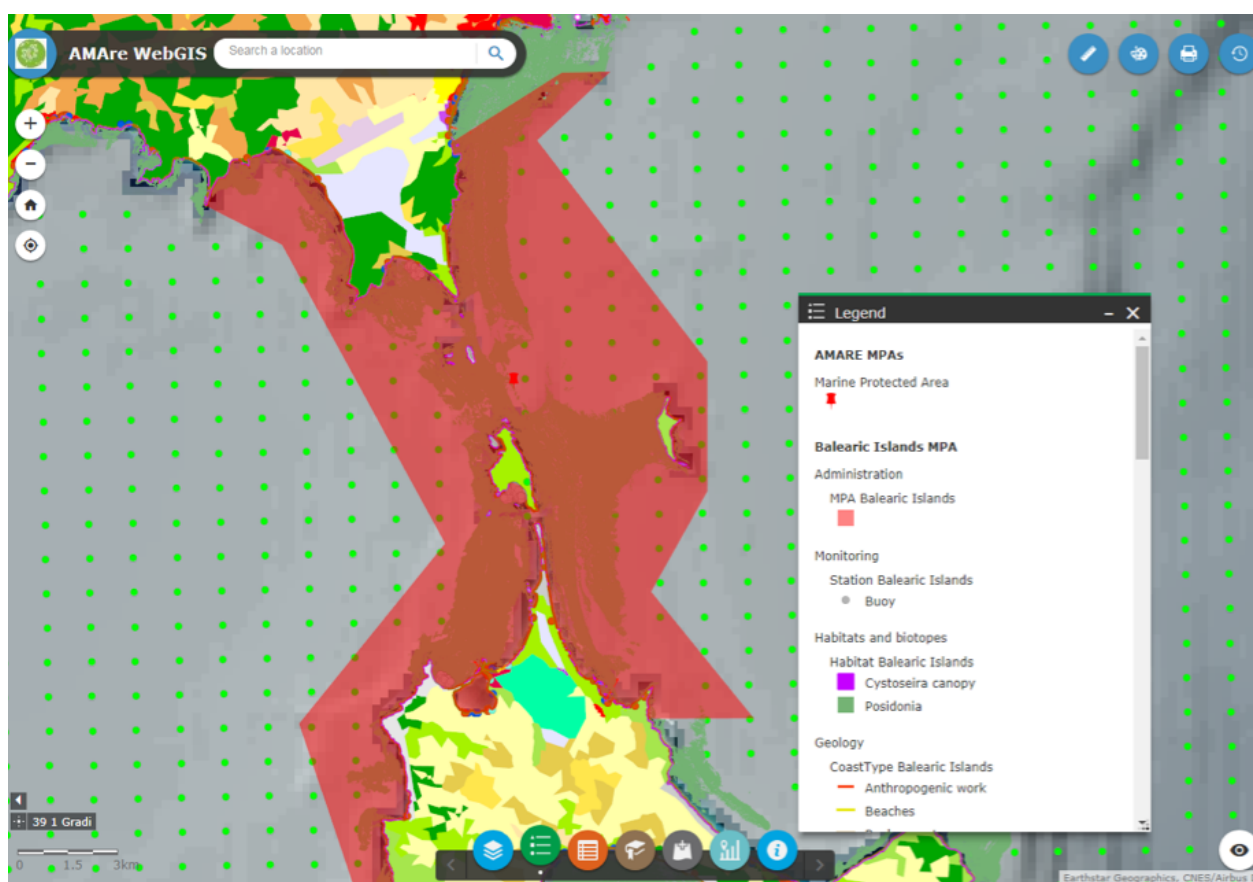


Figure 10, Examples of thematic layers and spatial tools available in the AMAre Geoportal. Source: <https://amare.interreg-med.eu/toolbox/geoportal/>.

Contacts

CoNISMa: Simonetta Frascchetti, +39081679077,
simonetta.frascchetti@unina.it;

Maddalena Laggini, laggini@conisma.it

E. Claudia La Marca, emanuelaclaudia.lamarca@unipa.it

Euro-Mediterranean Centre on Climate Change

Foundation: Coppini Giovanni, +390832671050,
giovanni.coppini@cmcc.it;

National Research Council - Institute of Marine Sciences
(Bologna): Federica Foglini, +390516398872,
federica.foglini@bo.ismar.cnr.it;

CSIC-CEAB - Blanes Centre for Advanced Studies:
Macpherson Enrique, + 34972336101,
macpherson@ceab.csic.es;

French Research Institute for Exploitation of the Sea:

Francois Galgani, 0495389510, francois.galgani@ifremer.fr;

Management Consortium of Torre Guaceto: Alessandro
Ciccolella, Francesco de Franco, +390831990882,
segreteria@riservaditorreguaceto.it;

Hellenic Centre for Marine Research - Institute of Marine
Biological Resources and Inland Waters (IMBRIW): Vassiliki
Vassilopoulou, +302109856706, celia@hcmr.gr;

University of Malta - Physical Oceanography Research
Group (Dept. of Geosciences): Aldo Drago, +35621440972,
aldo.drago@um.edu.mt;

Management Consortium Marine Protected Area Porto

Cesareo: Paolo D'Ambrosio, +390833560144,
paolodambrosio@hotmail.com;

Regional Government of the Balearic Islands,

Department of Environment, Agriculture and Fisheries: Juan
Mercant Terrassa, +30971176666,
jsaguilar@dgpesca.caib.es.



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