



Actions for Marine Protected Areas

AMAre

Interreg MED

Coordinator: CoNISMa

Minutes of the final Meeting

24-25th January 2020

Hosting Institution: CoNISMa

Marevivo, Lungotevere Arnaldo da Brescia Scalo de Pinedo, 00196 Roma (RM)

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During this final project meeting concrete contributions produced by each partner of AMAre to the implementation of common marine protected area management strategies were presented. The discussion covered the most important outcomes achieved by each partner during these three years, addressing both the difficulties and the gaps found and also the synergies with other partners and InterregMed projects. A comparison between the initial aims of the project and the achieved results has been done, with the consideration that what is presently necessary is to find the right way to transfer the AMAre outcomes to other Mediterranean realities. With this regard,

the production of a booklet containing the best practices and guidelines to promote a coordinated approach for the management of a network of MPAs in the Mediterranean Sea is in progress and a list of scientific publications on the different topics addressed by AMAre has been shared among the partners.

In detail, the following topics have been discussed:

- **ISMAR-CNR** (Speaker: Dr. Valentina Grande): “The Spatial Geoportal: a great success”.

A synthesis of the objectives accomplished during the three years of AMAre has been provided, with attention to each step of the implemented workflow (the collection of data, the creation of the Geodatabase, of the Geoportal and, lastly, the construction of a metadata catalogue). An overview of the functions of the geoportal has been provided to the presents, with special focus on the “User Manual”, recently implemented and added to the Geoportal website. A live demonstration on how to consult the metadata catalogue and the oceanographic web map services has been shown. Moreover, statistical information and graphs are available on the geoportal, such as the number of access within each AMAre MPA, as an example. With this respect has been noticed that Malta, compared to the other project MPAs, has the highest number of visits during the month of June 2019, maybe due to the organisation and the great success of the stakeholder meeting. The inclusion of the data coming from the monitoring within the AMAre sampling locations is well advanced. At the end of the presentation the discussion concerned the fate of the AMAre Geoportal after the end of the project. Probably the Geoportal, the Metadata catalogue and the OGC services will be maintained for at least 6 months, although this will depend on the agreements and on the future availability of funding.

- **Torre Guaceto Marine Protected Area** (Speaker: Dr. Francesco De Franco): “The importance of AMAre to support the MPA: suggestions for future projects”.

Two are the positive outcomes from AMAre which greatly help the MPA management: 1) the construction of the Geoportal, and 2) the implementation of a systematic approach to the management. In order to have a comparison among the management schemes, it is indeed important to adopt this approach and to share a common management scheme among MPAs. By contrast, the difficulties to involve the MPA management bodies in the governance evaluation was recognised as a great limit to the design of concrete management actions and, with this respect, the ISEA scheme could be a tool which aid and makes easier the interaction with the MPA managers and among them.

This discussion focused on the ISEA schemes implemented for the 4 AMAre MPAs (the National Marine Park of Alonissos Northern Sporades, Torre Guaceto, Porto Cesareo, and Freus d’Eivissa I Formentera MPAs). Each management scheme is the result of the characteristics of each MPA, including the analysis of the ecological context and of the socio-economic components, and provides specific indications for the definition and the achievement

of management targets. The adaptation of the ISEA scheme to MPAs that are basically very different each other is the base to convince that this management approach can be adapted to the whole Mediterranean.

- **Porto Cesareo Marine Protected Area** (Speaker: Dr. Andrea Picciolo): “The importance of AMAre to support the MPA: suggestions for future projects”.

Last field activities conducted within the area of Porto Cesareo included: a drone survey for 1) detecting the presence of marine litter on the sandy beaches and 2) monitoring the local erosive dynamic of the sandy coasts, by the temporal comparison of *Posidonia oceanica* banquettes pictures (from November 2019 to April 2019). This temporal monitoring provides quantitative indications on the erosive dynamics of the sandy coast at a scale of centimetres and it is useful to plan actions to face local coastal erosion phenomena.

Underwater photogrammetry survey has been done to monitor the pocket beaches fluctuation and *Pinna nobilis* mortality event in the area of Porto Cesareo, recording data on the number and the size of the dead bivalves. Unfortunately, the data loggers for the temperature monitoring have been lost, due to extreme weather conditions which occurred last November. The strong collaboration among the Porto Cesareo MPA, the CMCC and the University of Pisa, moreover, allowed the implementation of models describing the probability of occurrence of *P. oceanica* and of dead matte in the area, considering present seagrass distribution together with a selection of abiotic variables.

- **HCMR** (Speaker: Dr. Mairi Maniopolou): “Final considerations after three years: MPAs, biodiversity and ecosystem services”.

An overview on the progress advanced within the framework of AMAre has been presented by the HCMR. Significant improvements about the ecological status and distribution of the priority habitats under study (e.g. *P. oceanica* meadows, Coralligenous formations) together with the assessment of the effects and distribution of local pressures within the NMPANS, critical for the validation of the cumulative impact assessment (CIA) approach, were obtained. Regarding the seagrass meadow ecological status assessment, in addition to anchoring, also both oceanographic variables and the nutrient load assessed at fine scale, are recognised among the relevant drivers which affect its ecological status. Moreover, an unexpected event featured by a filamentous mucilaginous bloom has been recorded during the field surveys, probably related to the phosphorous load in the area, demonstrating the relevance of the land-sea interactions for the implementation of effective management plans. Additional caves for monk seal protection have been identified, since the conservation of this mammals is among the main priorities of the NMPANS.

Efforts for reducing the inter-sectorial conflicts concerned the promotion of local participatory approach, through the organization of workshops and other initiatives, such as the involvement of divers specialised in the collection of ghost nets and their re-use for clothes production

(meeting also the aims of the circular economy). A positive attitude for the NMPANS by locals has been reached, probably due to the perception of a socio-economic return due to its institution and to the creation of a diving parks, diving routes and an underwater museum protecting an important shipwreck. Furthermore, face to face interviews with the stakeholders concerning the ecosystem service assessment have been carried out (as the deliverable 4.10.1 reports) and demonstrating the sensibility of the common people toward specific conservation concerns and environmental priorities (such as climate change).

In conclusion, although the NMPANS left AMAre almost at the beginning of the project, the achieved outcomes are in line with the initial planned activities.

- **University of Malta** (Speakers: Dr. Anthony Galea, Dr. Adam Gauci; Dr. Audrey Zammit, Professor Alan Deidun): “Final considerations after three years: ready for concrete applications of Maritime Spatial Planning”.

The main result coming from the surveys carried out at Malta and Gozo were presented.

Marine beached litter accumulation areas along the coastlines of Malta, Gozo and Comino have been surveyed by boat in 2018 and 2019, in order to identify and quantify the litter found in preselected sites and use this information for the construction of a cartography describing the distribution of litter. All the recorded debris, indeed, have been plotted on a map where the coastline was divided into 500 m long segments. The total number of marine beached litter present on each segment was represented by a different colour.

The monitoring of temperature by data loggers is currently ongoing and data have been downloaded twice.

The stakeholder workshop was another crucial event organised by the University of Malta during the last months of the project. The event named “Safeguarding the Marine environment Together - Bridging Conservation and Stakeholder Uses in the NE Marine Protected Area“ was held during the European Maritime Day 2019, with the participation of the Malta Marittima Agency, Malta Council for Science & Technology and AquaBioTech Group. A huge variety of stakeholders from different categories (e.g. aquaculture, divers, tourism, NGOs, professional and recreational fishers) attended the workshop. The participants were involved in a practical Maritime Spatial Planning (MSP) exercise focusing on the analysis of conflicts within the North-East Marine Protected Area of Malta and the possible solutions, in order to meet conservation objectives and the interest of the economic activities. The event demonstrated the supportive role that the stakeholders play in implementing the new MSP legislation, analysing and solving conflicts of interest by finding possible solutions, underlining one more time the importance to design a network of stakeholders and to build dialogue and awareness on marine conservation issues.

Another activity of this last project period was the monitoring of *Pinna nobilis* by involving the divers. Moreover, a ROV survey and a scuba diving survey were carried out in order to

assess 1) the effect of commercial fishing anchoring on the seabed and 2) the effect of recreational boating anchoring on *P. oceanica*. The anchoring impact intensity was assessed by means of an *ad hoc* index and maps representing the number of anchoring and total impacted area were produced.

Cumulative impact assessment on *Posidonia oceanica* and mäerl beds considering the whole variety of human activities occurring within the NE MPA and the correlation between commercial shipping and the consequent impact (the anchoring) on the seabed provide useful MSP indications, linking the economic value and the ecological value.

- **CSIC** (Speaker: Dr. Antoni Garcia Rubies): “Monitoring Balears: the lessons learnt”.

This presentation focused on the analysis of the main pressures acting on the biodiversity within the Freus d’Eivissa i Formentera Marine Reserve and the Ses Salines d’Eivissa I Formentera Natural Park. Eivissa and Formentera currently have 35.39% and 43.15% of the territory under several figures of environmental protection. The main target of the marine reserve is to protect fish populations of commercial interest by artisanal fishery and assure their recovery. The conservation of marine habitats is just a result of a well enforced protection, contrary to the Natural Park which aims to the full conservation, rehabilitation and recovery of natural patrimonies, with particular attention to the preservation of the *Posidonia oceanica* meadows and for fixing the appropriate limitations for fishing and navigation activities.

Among the main local pressures acting in the area, tourism (e.g. demographic increase, changes in the land use, nautical tourism) is recognised as the first pressure affecting the area, followed by fishing. Industry and transport, mortality events (*C. caespitosa*, *M. helena* such an example) and extreme climatic events are among the main external factors which threat the area. However, an efficient enforcement of all of these activities makes the MPA an effective conservation tool. A discussion took place on the reasons preventing the MPA management body to properly join the project finally resigning from it. The problem, probably, was the low interest of the MPA toward conservation issues relative to habitat vulnerability that are not directly related to the management of commercial fish stocks.

- **CMCC** (Speaker: Dr. Rita Lecci): “The role of oceanography in the MPA management”.

The role of the CMCC within the framework of AMAre was the development of physical ocean indicators for support the assessment of the ecological status of the marine environment, as international directives require (the Marine Strategy Framework Directive 2008/56/EC).

After three years from the beginning of AMAre, the computation of oceanographic climatologies for the MPAs of interest have been uploaded until December 2019 and climatologies and indicators for the MPAs have been implemented, with an intensive collaboration with the University of Malta and the IFREMER. Specifically, two Environmental

Index have been developed: the “Eutrophication Index”, which informs about the Ecological Quality Status at local scale and the “Residence Time Index”. This last is an indicator of the pollutants which a specific location is subjected to and informs about the vulnerability of a habitat to the nearby pollutants.

A forecast map of the marine litter pathways within the AMAre MPAs was implemented and included in the “Monitoring and Assessment guidelines for Marine Litter in Mediterranean MPAs”, coordinated by the IFREMER. Furthermore, support was provided to the University of Pisa to implement maps of probability of regime shift of *P. oceanica* meadows.

- **Politecnico di Milano** – CoNISMa (Speaker: Dr. Caterina Lanfredi): “The importance of Land-Sea Interactions for the management of Marine Protected Areas”.

The consideration of Land Sea Interactions (LSI) was an essential issue of AMAre, in order to highlight potential additional drivers of change in the MPAs of interest (e.g. the touristic pressure, agricultural run-off, eutrophication, pesticide contamination), supporting the design of measures and tools for the sustainable use of maritime space.

With this respect, the contribution from the Politecnico di Milano was to develop a methodology to consistently analyse how activities on land might affect the MPAs and produce maps describing the LSI.

In detail, socio-economic activities and bio-geochemical processes have been considered as the main responsible of the LSI. In detail the touristic flux in the Apulian Region, Malta and the Balearic Islands has been analysed and the increase of waste production, of recreational boating and the decline of the water quality have been identified as the main pressures produced. With this respect, the poor ability to recover a high percentage of plastic waste, with strong consequences for the marine environment, highlighted the necessity to improve the practices of waste management.

Regarding the bio-geochemical processes, maps describing a runoff rate for each considered MPAs have been produced by a combination of runoff predictions (by the Curve Number Method) and Digital Terrain Models. These maps provide a proxy of pesticide and contaminant distribution over a considered area, providing important information at local scale regarding the water quality, extremely useful for management purposes and for monitoring and sampling activities on specific areas of interest. Moreover, from these predictions it was found that the area of Torre Guaceto seems to be affected by a higher runoff value compared to Porto Cesareo.

- **University of Pisa** – CoNISMa (Speaker: Dr. Luca Rindi): “Development of surveillance maps of the risk of collapse”.

The contribution of the University of Pisa to AMAre was the definition of guidelines and early warning indicators of regime shifts for monitoring the risk of collapse of benthic ecosystems, with specific attention to the *Posidonia oceanica* meadows and *Cystoseira* spp.

forests. The production of maps describing the probability of occurrence and collapse of both these habitats not only within the AMAre MPAs but also across the whole basin, represented a valid progress, allowing the identification of areas subjected to a high risk of ecosystem shift.

Furthermore, during the last months, specific attention has been focused on the area of Porto Cesareo, with the production of additional maps modelling the probability of occurrence of a *P. oceanica* meadow or dead matte. Also these last implementations represent a useful tool for the identification of areas that need specific conservation efforts and management actions.

Discussions proceeded during the second day and proposal and initiatives regarding the transferring of the AMAre outcomes and tools were shared among the presents. The Steering Committee (SC) took place before the closure of the meeting.

- **Ifremer** (Speaker: Dr. F. Galgani): “Marine litter, MSFD and MPAs”.

This discussion was held by skype and concerned the production of the report titled “Monitoring and assessment guidelines for marine litter in Mediterranean MPAs”, being an important contribution of AMAre coordinated by the Ifremer. This report represents a practical guide for the definition of monitoring programmes to assess the distribution and abundance of marine litter in the MPAs. The proposed monitoring strategies and sampling protocols consider the recommendations of the UN GESAMP report on monitoring marine litter (GESAMP, 2019), basing also on the experience of ongoing monitoring and assessment activities within the framework of a number of scientific projects (CleanSea, MareLitt, Perseus, Marlisco, Ac4forlitter, INDICIT, MEDseaLitter, Plastic Buster MPA, PANACEA, Life projects) and publications. Also, assessment practices coming from the UNEP/MAP and the Marine Strategy Framework Directive have been considered for the implementation of the present report.

A number of different monitoring protocols have been developed, specifically for the assessment of: beached debris through aerial footage, underwater marine litter through the use of a wave gliding, automated parametrisation of beached litter, indicators of entanglement within MPAs. Furthermore, this report also includes a protocol for mapping litter accumulation along the coastlines, modelling the transport of marine litter in MPA and predicting the stranding of litter in MPAs. Intense collaboration with the LaMMA, the University of Malta and the CMCC was fundamental for the production of this practical guide. The suggested approaches are very interesting and useful for MPA managers and all the member states will adopt the implemented protocols.

- **University of Naples – CoNISMa** (Speaker: Professor Simonetta Frascchetti): “Science-based monitoring to support MPA management”.

AMAre aimed to overcome the gaps that still limit the effectiveness of MPAs in the Mediterranean Sea and the constitution of a solid MPA network at basin scale. The intensive field activities and fine-scale monitoring performed within the 5 AMAre MPAs and outside boundary locations informed on the local context of each MPA. Although these MPAs represented laboratories for the implementation of pilot actions, the choice of external controls, differently from what the international directives require, was relevant to understand what really works and not in the MPA management plans. With this respect, fine scale monitoring on coralligenous formations at Torre Guaceto and Porto Cesareo revealed the higher presence of structuring invertebrate taxa outside the MPA rather than within their boundaries and an opposite trend for the distribution of debris and fishing tools, providing useful information for management purposes. Although in some cases the interaction with the MPA management bodies was difficult, the implementation of guidelines for the management and the regulation of the SIC «Torre Guaceto Macchia San Giovanni» was a positive example of collaboration between the Torre Guaceto MPA and the AMAre team. Workshop and meeting with the participation of territorial governance, MPA personnel, stakeholders from the world of fishery, tourism and locals have been organised to discuss issues about the implementation of a plan for the SIC management, incorporating the responses received from locals, concerning the regulation, the management, the monitoring plans, the economic incentives and the educational programs.

However, the transfer of the AMAre main achievements and tools to other Mediterranean MPAs is still difficult. For this reason, the production of a booklet containing the best practices and guidelines to promote a coordinated approach for the management of a network of MPAs in the Mediterranean Sea is nearly completed. The publication of the main project outcomes is crucial to disseminate the achievements of AMAre and a draft of a potential common paper including the different topics of the project (data sharing, biodiversity and threats assessment, socio-ecological systems, the link among fine scale data and model) has been prepared as a basis for a future AMAre publication.



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Figura 1, Picture of the AMAre team at the last project meeting.