Deliverable 2.2 – Robust Social and Governance Tools towards Effective, Efficient and Resilient Networks of MPAs

WP2 – Science-Based Tools for Socio-Economic and Governance Solutions

Version 1.4 | April, 2026

(Grant Agreement: 101094014)

HORIZON-MISS-2021-OCEAN-02-01- Blueprint demonstration for co-created effective, efficient and resilient networks of MPAs

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

Document History

Deliverable Title	Robust social and governance tools towards effective, efficient and resilient networks of MPAs
Brief Description	This deliverable presents results of social and governance tools implementation towards effective, efficient and resilient Marine Protect Areas (MPAs) and MPA networks management and design. The needs of specific MPAs (Living Labs (LLs) and Information sites (IS) are identified and the relevant social and governance tools are implemented. The report also provides a reflective account of lessons learnt in the tool implementation and recommendations for their future use in other MPAs or conservation areas.
WP number	WP2
Lead Beneficiary	WU
Core Author(s)	Moses Adjei, Soraya Lamochi Roozalipour, Eira Carballo Cárdenas & Kaisa J. Raatikainen
Deliverable Due Date	30/11/2025
Actual Delivery Date	31/12/2025
Nature of the Deliverable	R – Report
Dissemination Level	Pub-Public
Approved by	
Contributors	Moses Adjei, Soraya Lamochi Roozalipour, Eira Carballo Cárdenas, Kaisa J. Raatikainen, Tomas Buitendijk, Riku Varjopuro, Aino Rekola, Lois Watt, Venla Ala-Harja, Francesca Frau, Michela Congiu, Maëlla Sicard, Rita Trabulo, Annaïk Van Gerven, Geertje Schuitema, Hilde Toonen, Sergio Scanu, Luciana Muscogiuri, Maria del Mar Bosch, Francesco Paolo Mancuso, Raffaella Bullo, Kora Dvorski, Milena Raičević, Nemanja Malovrazić, Jelena Leković, Dijana Došljak, Francesco de Franco, George Hoppit, Joséphine Louwette, Alessia Pagano, Cédulie Chapot, Sija Brinksma, Lydia Rose, Piera Pala, Valeria Masala, Nicoletta Cadoni
Deliverable number	D2.2
Keywords	Marine Protected Areas, Social dimensions, Governance, Tool implementation

Please cite this deliverable as:

Adjei, Moses et al. (2026). Social and governance tools for MPA network design and management. Deliverable – D2.2 under the WP2 of the BLUE4ALL project (GA n° 101094014).

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

Date	Ver.	Reviewers	Comment
31-10-2025	First Draft	Annaïk Van Gerven, Raatikainen Kaisa	Internal T2.2 Review
21-11-2025	Second Draft	Maëlla Sicard, Lawrence Whatley	BLUE4ALL Review
19-12-2025	Submission	-	Final Submission
22- 04-2026	Revised Version	-	Final Revision

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

Table of Contents

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

List of Figures

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

List of Tables

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

Abbreviations and Acronyms

BA	Baseline Assessment
CBD	Convention on Biological Diversity
CP	Contact Point
D	Germany
DK	Denmark
EST	Estonia
EU	European Union
FIN	Finland
FR	France
GIS	Geographic Information System
HELCOM	Baltic Marine Environment Protection Commission
IRL	Ireland
IS	Information Site
IT	Italy
IUCN	International Union for Conservation of Nature
LL	Living Lab
LSM	Littoral Seino-Marin
LT	Lithuania
LV	Latvia
MNE	Montenegro
MPA	Marine Protected Area
MSc	Master of Science
NA	Needs Assessment
NGO	Non-Governmental Organisation
OECMs	Other Effective Area-Based Conservation Measures
OFB	French Biodiversity Agency
PEAR	Perception Elicitation and Awareness Raising
PECZM	Public Enterprise for Coastal Zone Management
PL	Poland
QGIS	Quantum Geographic Information System
RUS	Russia
S	Sweden
SAC	Special Area of Conservation
SAGE	Site-Level Assessment of Governance and Equity
SBZ	Special Protection Area (Birds Directive)
SEG	Stakeholder Engagement Group
SPA	Special Protection Area

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

UNIPA	University of Palermo
WCPA	World Commission on Protected Areas
WG	Working Group
WP	Work Package
WU	Wageningen University
WWF	World Wildlife Fund

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

1. Executive Summary

Deliverable 2.2 summarizes the findings of the BLUE4ALL project on improved tools and methods to address social and governance challenges of marine protected area (MPA) management and network design (including Other Effective area-based Conservation Measures (OECMs)), as well as to establish good governance principles in their respective practices. The report also includes assessment criteria that will highlight factors critical to social sustainability in the form of a typology of sociogovernance processes in MPAs. The report starts by outlining the importance of social and governance perspectives in marine conservation in general and MPA management in particular. It continues to describe the range of social and governance tools that exist for MPA management and subsequently explains how a subset of such tools was used in the project in collaboration with the participating MPAs, i.e., Living Labs (LLs) and one Information Site (IS). Most social and governance needs that were identified in the participating MPAs were related to collaboration with stakeholders; communication, outreach, and raising awareness about the MPA; and justice and equity considerations as part of MPA planning and management. As a result, the tool implementation focused on these topics instead of systematically reviewing the full availability of social and governance tools. For each participating LLs and IS, the report describes its key social and governance challenges, explains which tools were implemented in each site, and summarizes lessons learned from the tool implementation.

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

2. Introduction

2.1 Objectives of Task 2.2 – Social and Governance Tools

Work Package (WP) 2 (Science-based tools for socio-economic and governance solutions) of the BLUE4ALL project aims to enhance the capacity of Marine Protected Areas (MPAs) and MPA network managers and designers to incorporate social, economic, business, and governance aspects into their work. The primary goal of MPAs is nature conservation, but their great socio-economic impact requires paying attention to social dimensions for effective and efficient management (Jentoft et al. 2007; Pollnac et al. 2010; Scholar et al. 2020). This is particularly so because extant research shows that despite the growing attention to social dimensions of MPA management, the qualitative elements around fairness, equity, and cultural values are still poorly understood (Bennett, 2025; Pascoe et al., 2024).

In line with the above, within WP2, Task 2.2 provides insight into the usability of various tools tailored directly for community engagement and inclusion, or which contribute to enhancing equity, justice and well-being. This work contributes to the project's objective to improve tools for effective and efficient management of MPAs and for good governance of MPA network design, including the OECMs (Deliverable 2.2). It also contributes to the WP2 overall objective to enhance the capacity of MPA managers and designers of MPA networks in incorporating social, economic, business, and governance perspectives in their work. This is achieved through illustrating principles, guidelines, and best practices on good MPA governance as well as workable methods for effective and equitable public participation in the design of MPAs.

As outlined in an earlier project deliverable (Deliverable 2.1 by Varjopuro et al. 2023: Enablers for socio-economic transition processes towards effective, efficient and resilient networks of MPAs), the BLUE4ALL project considers "a tool" as an umbrella term, referring to hands-on instruments used in marine protection on the one hand, but also to methods or techniques to organize or facilitate activities on the other hand; including guidelines on good MPA governance and workable methods for equitable public participation in the design of MPAs. The tools addressed by Task 2.2 can be roughly divided between *governance tools* that seek to support or strengthen governance structures, processes or practices and *social tools* that help users, including MPA designers and

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

managers, to achieve social goals, like becoming (more) inclusive and equitable, building up trust among MPA users or raising awareness about the ecological and cultural value of an area (Karcher et al., 2022; Kenter & Martino 2021) (see Varjopuro et al. 2023 for more details).

Under Task 2.2, science-based social and governance tools have been implemented in selected Living Labs (LLs) and one Information Sites (IS). This collaborative process has been informed by a protocol for collecting information on needs from the LLs and giving instructions on validating and co-creating economic, social, and governance tools (as described in BLUE4ALL Milestone 7), as well as the LLs testing package (D4.2 by Dvorski et al. 2024). The tested tools will be incorporated in an online MPA Solutions Hub. For this purpose, this report provides results of real case study sites where selected social and governance tools have been tested, validated, and lessons learned could feed into ongoing MPA management processes. In short, the results of Task 2.2 will enhance effective and efficient management of MPAs through emphasis on social dimensions and good governance of MPAs and their networks. The types of tools tested were based on different considerations including the needs of the MPA, the stage of MPA design and the typology of management processes which are further discussed in the next sections (Dvorski et al., 2025). Tools suitable for LLs/IS were informed by a predefined list developed during earlier stages of the project (Task 1.3), and research team's own expertise, based on which a matchmaking exercise was conducted to recommend potential tools and methods to specific LLs (See D4.4 by Dvorski et al. (2025) for details).

2.2 Integrated Solutions Framework for the MPA Solutions Hub Development

To address the broad variety of challenges faced by MPA managers, the BLUE4ALL project has developed an Integrated solutions framework (hereafter solutions framework), which serves as the primary structure of the MPA Solutions Hub, thus guiding the platform users' selection of tools when they access the website (see for details D1.4 by Arda et al. 2024). The work done under Task 2.2 connects to the BLUE4ALL solutions framework. The solutions framework builds on three key aspects: MPA phases, dimensions, and components (Figure 1). The four MPA phases comprise the planning, implementation, management, and reviewing phases of the MPA cycle. The four *dimensions* cover the ecological/environmental, social, economic, and governance realms, all of

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

which together affect MPA (network) design, implementation, monitoring, and evaluation (Meehan et al. 2023). These dimensions consist of twelve key *components* (Figure 1). As a whole, the solutions framework highlights the importance of integrating various tools and methodologies to address the multifaceted challenges faced by MPA practitioners (Arda et al. 2024).

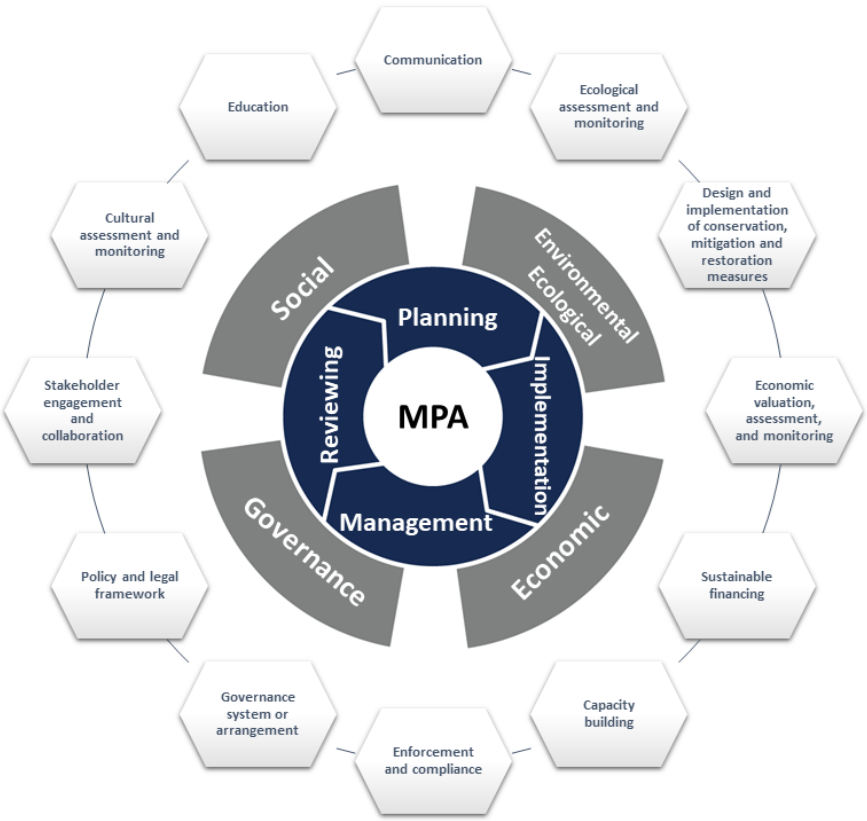


Figure 1 - The BLUE4ALL integrated solutions framework (Arda et al. 2024). Visualization by Tin-Yu Lai. Social and governance tools addressed by Task 2.2 feed into all MPA phases (the inner circle), targeting specifically the social and governance dimensions (the middle circle), and are relevant for multiple framework components (the outer circle).

Whilst the solutions framework provides a template for broader integration of tools and methodologies spanning from ecological, economic, social and governance dimensions to address the multifaceted challenges faced by MPAs, the processes involved in the different dimensions and their characterization of stakeholder involvement may vary. The solutions framework aims for an overview of relevant topics in MPA management without detailing the complexities inherent to such topics. Social and governance issues are highly context specific and less predictable than ecological

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

and economic issues. As such, a goal-based typology of sociogovernance processes in MPA management was developed as part of Task 2.2, which supports the selection of appropriate social and governance tools to achieve conservation goals in collaboration with stakeholders (see Buitendijk et al., 2026). This is further discussed in the next section.

2.3 A Typology of Sociogovernance Processes

To clarify the relationship between social and governance processes within Task 2.2, the project team developed a characterization, or typology, that highlights the inherent social nature of all stakeholder engagement processes (Figure 2). This critical interface between the social and governance dimensions of MPA stakeholder engagement was highlighted through use of the term "sociogovernance". The typology demonstrates how the effective, efficient and resilient management of MPAs and MPA networks requires managers and other key decision-makers to select and apply context-appropriate sociogovernance tools to enhance their interactions with stakeholders in the community, industry, and non-governmental organizations. Despite their varying characteristics, each of these tools may be used to give shape to different management processes in the pursuit of various MPA-related goals. In this way, the typology achieves two goals. First, it helps to conceptually understand the characterization of the sociogovernance processes that are relevant for MPA management. Second, the typology is "goal-based", in that it supports the selection of appropriate tools to achieve agreed conservation goals in collaboration with stakeholders.

The typology identifies three pillars that capture the sociogovernance dimensions of MPA management (inspired by Davret et al., 2024; Kloppenburg et al., 2022; Steg & Van Der Werff, 2015; Steg et al., 2021): *Knowledge & Understanding (K&U), Engagement & Participation (E&P),* and *Policies & Interventions (P&I).* These pillars are linked by management processes that are usually either top-down or bottom-up, as follows in Table 1:

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

Table 1 - Pillars that capture the sociogovernance dimensions of MPA management (Retrieved from Buitendijk et al. (2026).

Pillar / Path	Characterization
Mobilization (K&U → E&P)	Captures how local values and knowledge can be used to support grassroots engagement with the MPA.
Synthesis (E&P → K&U)	Describes the process of systematic scientific and local knowledge integration about the MPA.
Co-creation (E&P → P&I)	Reflects inclusive multi-stakeholder processes to exchange knowledge and collaboratively develop instruments for MPA management.
Communication (P&I → E&P)	Information about MPA administration is provided to stakeholders by administrators.
Reflection (P&I → K&U)	Describing the process in which stakeholders reflect on their values, knowledge and (cultural) practice in the context of MPA management.
Adaptation (K&U → P&I)	The social consequences of MPA management are monitored to inform necessary changes.

The above characterizations of each path have been drawn from the recent academic publication by Buitendijk et al. (2026), which can be consulted for further details on the operation and possible application(s) of the typology.

Error! Reference source not found.

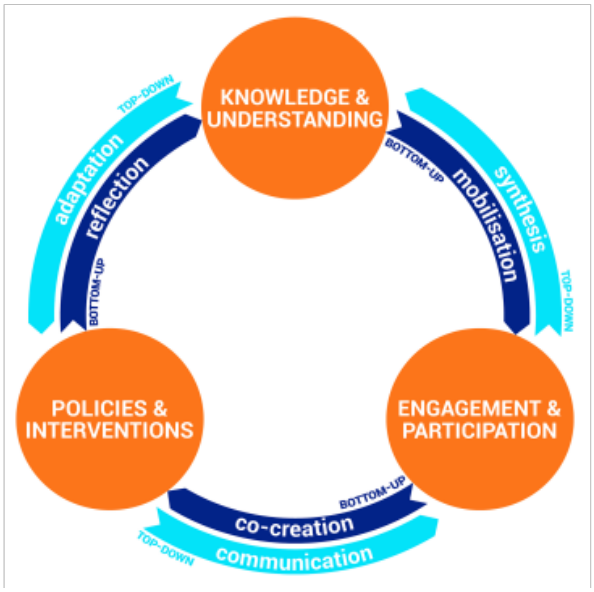


Figure 2 - Goal-based typology of sociogovernance processes in MPA management. Graphic design by Yvon Schuurmans (Summum Ontwerp). Retrieved from Buitendijk et al. 2026.

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

3. Summary of Baseline Assessment and Needs Assessment - Social and Governance Challenges

As part of the work conducted under BLUE4ALL Tasks 4.1 and 4.2, a Baseline Assessment (BA) and Needs Assessment (NA) were designed and implemented in collaboration between WP2, WP3 and WP4. The following sections briefly explain both processes and provide their key results.

3.1 Baseline Assessment

3.1.1 Design

The BA was a survey led by WP4 and collaboratively developed with WP2 and WP3 under Task 4.1. The BA's aim was to generate a basic understanding of the different tools that have (not) been used by respondents from a selection of MPAs and MPA networks to inform our future work in BLUE4ALL. The BA survey was applied in 25 MPA sites over several months in 2024. Respondents to the survey included MPA managers, academics, and other stakeholders with knowledge about governance, socio-economic and ecological processes.

The 25 MPAs (including MPA networks) are located in various European Seas and one is located in Brazil. In total, 11 ISs and 14 LLs completed the survey (see Annex **Error! Reference source not found.**1). The inclusion of these 25 BLUE4ALL sites and the survey respondents was based on relevance and pragmatic criteria: participation in BLUE4ALL as partners or existing contacts with relevant MPA stakeholders.

The survey consisted of three sections. Section 1 covered general information, including questions on the role of the respondent, the MPA management plan and which elements of management it encompassed. Section 2 contained WP2-specific questions focusing on sociogovernance, economic valuation, and financial aspects, and Section 3 contained WP3-specific questions addressing ecological and environmental aspects. While the process of BA survey implementation and key recommendations derived from it are summarized in deliverable 4.4, "Tool validation report. WP4—Learning and testing in LLs: Optimizing blueprint generator to deliver conservation results and socio-economic benefits" (Dvorski et al., 2025), in this section we present key findings, focusing on

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

selected questions from Section 1 that provide an overview of important issues related to management, and the four questions on the sociogovernance dimensions from Section 2.

3.1.2 Key Results

Starting with Section 1, answers to the question "Do you have any kind of management plan in place for the MPA you are working with?" showed that most respondents (n=22) said *Yes* (82%), while 14% answered with *No*, and 4% did not know. When asked "Which of the following elements are included in the management plan?", where multiple answers were possible, the elements that respondents (n=19) selected were as follows: ecosystem management actions (100% of respondents selected this option), ecological impacts (95%), economic activities (78%), legislation (78%), educational activities (58%), social impacts, such as jobs and recreational activities (47%), maintenance of physical infrastructure (47%), cultural heritage (42%), effects of climate change (37%), financing MPA implementation (37%), green infrastructure (4%) and other (4%).

Most responses (n=22) to the question "Are there any socio-economic or ecological and environmental tools used in the management of the MPA you manage?" were a *Yes* (73%), with some *No* (23%) and a few I don't know (4%). When asked what types of tools respondents use (multiple answers possible), most responses (n=16) indicated software (73%), guidelines (68%), protocols for processes (68%) and Other (27%). As to "Who is using the tools?" where multiple answers were possible (n=16), managers were selected in all cases (100%), followed by legislators (56%), a category called "Only me" meaning the respondent themselves, often a scientist (44%), citizens (19%) and other (19%).

Section 2 consisted of four main questions with sub-questions, each asking first whether tools are currently used that address a specific social-governance issue or challenge (possible answers are *Yes*, *No*, *I don't know*), followed by a request for the respondents to describe such tools if the answer selected was *Yes*, or an explanation for why the respondent believes no tools are being used if the answer selected was *No*. The four social-governance issues selected were stakeholder inclusion in MPA governance, institutional and social partnerships, compliance enhancement, and conflict resolution. These four categories were selected as they were deemed to cover key social-governance issues in most MPAs.

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

The first question was “Are there tools/methods applied to ensure recognition of all relevant stakeholders (including their rights), their representation in MPA governance, and fair distribution of costs and benefits (e.g. access to resources, human health, well-being)?” The responses were 35% *Yes*, 60% *No*, and 5% *I don’t know*. The descriptions by those who answered *Yes* focused on the first part of the question, namely on tools for stakeholder identification and inclusion, and seemed to disregard the second part that focused on distributional issues.

Across the responses, two main categories of tools and methods can be identified: communication and engagement tools and formalized methodological frameworks. Communication tools mentioned by respondents included community events, social media outreach, websites, and other institutional visibility mechanisms designed to reach out to stakeholders. Formalized methodological frameworks included structured stakeholder analyses conducted during MPA planning, updated stakeholder registers maintained by authorities, often using technical systems such as client requirement specifications (Excel/Relatics) linked to Geographic Information System (GIS) layers, enabling spatially explicit documentation of stakeholder interests. These tools facilitate systematic identification, mapping and tracking of actors and their needs. Within this category, other examples given were methodological guides, socio-economic assessments, and research-driven governance improvement projects (e.g., https://www.life-marha.fr/).

Respondents who answered *No* were asked to describe why such tools have not been applied. Several reasons were identified. First, political, legal and institutional barriers, namely lack of political will, no legal requirements, or lack of national capacity which prevented formal tool development. Second, perceived irrelevance: some MPAs considered such tools unnecessary for their current stage or objectives. Third, process-based approaches substituted for formal tools, particularly in transboundary contexts where bilateral meetings and scientific consultations ensured stakeholder involvement without explicit instruments. Finally, early-stage MPA development: recently designated MPAs had not yet established tools or frameworks. Additional answers cited simply non-use (“we do not have such tools”, “I don’t know”), or reliance on legally mandated obligations that do not require separate stakeholder identification mechanisms.

The second question was “Are there mechanisms, tools or methods to establish institutional and social partnerships in your MPA?” Responses were 52% *Yes*, 33% *No* and 14% *I don’t know*.

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

Respondents who answered *Yes* interpreted this broad question in a broad sense. Their answers can be classified into four categories: social and community-based instruments, formal institutional arrangements, contractual and administrative mechanisms, and network or project-based collaborations. Social instruments included environmental education events, local community engagement, citizen science initiatives, and regular consultation groups, all designed to build legitimacy and shared ownership of the MPA. Formal institutional mechanisms mentioned were partnerships between state authorities and Natura 2000 managers, co-management structures, planning groups, and multi-site management systems that ensure coherence across protected areas. Contractual mechanisms include cooperation agreements, *Memorandum* of Understanding, public calls, competitive contracting of scientific and consultancy services, and the Natura 2000 Charter, which formalizes voluntary commitments by users through structured obligations, recommendations and sanctions. Network-based methods draw on European initiatives and projects, which facilitate cross-institutional cooperation, knowledge exchange, and innovation. Specialized working groups, regional fishery committees, and joint governance bodies illustrate this kind of collaboration mechanisms.

Those who answered *No* gave as explanation that the tools were not deemed relevant (e.g. [not needed] “for the MPA roadmap”, “national agency did not find that relevant back then“) or the absence of a legal requirement.

The third question was “Are there mechanisms, tools or methods to enhance compliance (of the legislation) in your MPA?” The responses were 90% *Yes*, 5% *No* and 5% *I don‘t know*. Responses from those who answered *Yes* clustered around four main categories of compliance enhancing tools: legal/policy frameworks, which codify and clarify what activities are not allowed and how breaches to rules are sanctioned; surveillance and enforcement mechanisms, which enable actors mandated with ensuring compliance in the MPA; awareness and education tools, which aim to steer stakeholders towards compliant behaviour; and coordination structures, which aim to facilitate compliance enhancement practices by provision of legal and scientific expertise. Legal/policy tools include management plans, national strategies, conservation action plans, Natura 2000 impact-assessment procedures, consent requirements for listed activities, and sanctioning systems. Surveillance and enforcement are carried out by rangers, coast guards, police, harbour authorities

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

and inspectors, supported in some cases by video-surveillance, protocols, and environmental policing units (e.g., French Biodiversity Agency (OFB) inspectors). Awareness and education mechanisms such as signage, flyers, species guides, online materials, and public consultations aim to promote voluntary compliance and behavioural change. Coordination structures such as the Marine Environment Control Support Centre provide legal expertise, support monitoring, and align control strategies with national services. Challenges such as limited enforcement capacity and diffuse responsibilities were noted.

When asked why they had answered *No* to the question whether these tools were used in their MPA, respondents explained that there was “no political will or capacity at national level to undertake such an assessment” or “we don't know this possibility”.

The last series of questions focused on conflicts with or among stakeholders. First the question “Have you experienced any conflict of interest within the governance of the MPA?” was posed, to which 40% responded *Yes* and 60% *No*. This was followed by the question: “Did you use any mechanisms, tools or methods for conflict resolution?“ From those who responded (n=12), 75% said *Yes*, 8% said No and *16%* I don’t know. Responses from those who answered *Yes* can be classified into three categories of tools: institutional and legal, participatory mechanisms, and innovative, science- and project-based methods. Conflicts among stakeholders were addressed by clearly defining legal competences and making formalized management agreements. Participatory mechanisms such as meetings, bilateral consultations, and facilitated stakeholder dialogues ensured balanced input from affected groups. Moreover, thematic working groups, central to the Natura 2000 approach, gathered relevant actors, synthesized knowledge, negotiated measures and proposed compromises that were then validated by multi-stakeholder decision bodies (e.g., steering committee in Natura 2000 sites in France). These structures helped reduce conflict through iterative co-production. Innovative tools included socio-spatial mapping, scenario-building workshops, serious games (e.g., Marine Spatial Planning Challenge, Panache Expedition), and coastal-strategy processes that visualized pressures, explored future outcomes, and built shared problem understanding. Whereas some of these mechanisms are formal, such as fisheries co-management tables that provide sector-specific, durable negotiation platforms, others are informal,

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

such as ad-hoc mechanisms used by some MPAs that include common straightforward communication and negotiation practices (meetings, email exchanges) to reach practical solutions.

Those who responded No to the question were asked to describe the reasons why such conflict resolution tools were not applied. Responses were mainly due to “no conflict in the management of MPA exists at the moment“, and "I can't immediately think of which instruments could be used for that”.

3.1.3 Conclusions

Most MPAs surveyed during the BA reported to have some form of management plan which pays attention to social and governance aspects of the MPA besides addressing ecological impacts. In almost 75% of the MPAs surveyed, tools are being currently used to address challenges across ecological and social dimensions. When asked whether social and governance tools are used in their MPAs, responses varied depending on the type of issue: used the least (35%) are tools to include and recognize stakeholders while tools used the most (90%) are those to enhance compliance. MPA managers are reported to be the users of tools in all cases; other important users include legislators, scientists and other actors, and the diversity of tools reported is large.

The types of tools currently used to address issues related to stakeholder inclusion, partnerships, compliance enhancement and conflict resolution in the MPAs surveyed include both formal and informal tools, methods and mechanisms, requiring varying degrees of expertise and technology use and ranging from tools implemented ah-hoc as one-off activities, to those that are more embedded in MPA routines or institutionalized at national levels. In many cases, European Union (EU) projects have been key in establishing collaborative networks to experiment with novel tools and mechanisms. The most important reasons for not using tools are lack of capacity, low political will, perceived lack of relevance or not knowing the (possibility of using) tools.

3.2 Needs Assessment

3.2.1 Design

The Needs Assessment (NA) was led by WP4 and collaboratively developed with WP2 and WP3 under Task 4.2. It was implemented through interviews, group discussions or workshops by the

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

Contact Points (CPs) in their respective LLs. The goal of the NA was to identify LL-specific needs, and to enable BLUE4ALL project partners to select relevant tools that could be used in the LLs they collaborated with in tool implementation. Eleven LLs participated in the NA conducted by the BLUE4ALL team, of which five are MPAs and five are MPA networks:

- Väinameri ja Väike väin (EST)
- French Natura 2000 network - Channel North Sea (FR)
- Danish Wadden Sea (DK)
- MPA Capo Carbonara (IT)
- Vlaamse Banken / SBZ 1-3 (BE)
- Platamuni, Katič, Stari Ulcinj (MNE)
- Otranto Leuca (IT)
- Irish MPA Network (IRL)
- Finland's MPA network (FIN)
- HELCOM (Finland, Poland, Denmark, Germany, Sweden)
- Capo Gallo-Isola delle Femmine (IT)

The NAs were carried out through (multi-person) interviews or workshops. A common question sheet was developed (See Dvorski et al., 2025 for details) to guide conversations about the specific needs, challenges and priorities as well as to identify what solutions are currently in place or are being considered. Moreover, attention was given to available resources and capacities, and ideas about tools that could match the MPA needs. The specific MPAs/ MPA networks and their identified specific social and governance issues are summarized below:

Table 2 - Key social and governance issues identified through the NA process

Name of MPA/Network	Key Social/Governance Issues
Väinameri ja Väike väin (EST)	Fragmented management; need for more support from local communities
Irish MPA Network (IRL)	Need for better communication between stakeholders, local communities, and the government departments

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

Otranto Leuca (IT)	Awareness of stakeholders about the possible benefits of the MPA establishment
Vlaamse Banken / SBZ 1-3 (BE)	Communicating with stakeholders who resist change in management; recognitional equity; building and maintaining trust; improving regional cooperation
Finland's MPA network (FIN)	Challenges related to the compensation schemes (distributive equity); lack of political will; education of citizens about meaning of MPA
French Natura 2000 network - Channel North Sea (FR)	Need for effective and regular communication with citizens and elected representatives
HELCOM	Needs for greater involvement of different policy sectors; Competition for space with different sectors (access rights)
Platamuni, Katič, Stari Ulcinj (MNE)	Insufficient public awareness and education
Capo Carbonara (IT)	Lack of a good communication strategy for the collected data; low stakeholder participation; improve beach accessibility for people with disabilities
Capo Gallo-Isola delle Femmine (IT)	Raising awareness and understanding of tourism stakeholder perceptions; improving participation and dialogue among MPA stakeholders

3.2.2 Key Results

Next to the specific insights for the LLs, three common governance challenges have been identified. First, there is a need for (improved) collaboration and communication with MPA stakeholders and local communities. There were differences between the extent of engagement with stakeholders: in one LL there was a lack of interaction mentioned, while in others emphasis was on improving stakeholder dialogue. For some LLs, the need for an engagement and communication strategy was explicitly highlighted. In one LL, the issue of lack of ownership by users was discussed. Several LLs indicated the challenge of public awareness. The need of engaging with both stakeholders and local communities was also linked to their understanding and compliance to rules that serve MPA conservation goals, for example zoning.

Second, there is a common need for improved collaboration and communication with and between governmental departments. Several LLs indicated difficulties with bureaucratic-administrative processes as well as politics. Institutional fragmentation and complexity were deemed to hinder efficient and effective communication with state agencies. Furthermore, a lack of political will was

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

mentioned several times as a key barrier. This was also reflected in the need for more financial stability. While most LLs funding comes from government (at different levels, e.g. municipality or public enterprise), with some also receiving support from EU projects, it was generally felt that financial basis was not very stable.

Third, for the MPA networks, (re-) scaling is a common challenge. In both LLs, discussions referred to the need to align across scales, indicating that processes need to be adaptable to local contexts. Also, the starting point to establish a MPA network is considered challenging as the current MPAs have not been established with a network-rationale in mind.

3.2.3 Conclusions

The NA was mainly designed to capture ideas about existing or possible tools that can match MPA needs. Several LLs expressed the need for mapping and zoning tools, as well as tools that support stakeholder engagement, communication, and awareness raising. Tools to address these needs were implemented in 8 LLs and one IS (Chapter 5). When asked to reflect on the qualities that would be important for those tools, user-friendliness and knowledge-related aspects were mentioned in several LLs. Thus, NA was an important step in informing the the selection of tools for the specific LLs.

4. Tool Availability

As part of earlier work done under WP 1 (State of the art knowledge to underpin the LLs and development of the MPA Solutions Hub), a total of 38 tools were reviewed regarding the sociogovernance aspects of MPAs (Lai et al., 2023). Only two focus exclusively on the sociogovernance dimension: the Site-level Assessment of Governance and Equity (SAGE) tool (Franks, 2023) and MPA Management Effectiveness Assessment Tool (2011)[1]. The remaining 36 are either multidisciplinary frameworks, guidelines, or socio-economic decision-making tools that also address cultural, natural, or economic aspects. Seven of the reviewed tools did not provide

[1] https://library.sprep.org/content/marine-protected-area-management-effectiveness-assessment-tool-mpa-meat

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

examples of MPA/OECM applications, while about half of the identified cases are located in European seas.

The tools review was based on the framework used by Rasheed (2020) which systematically reviewed and categorized the indicators of human well-being that can be used to measure the relationship between human well-being and MPAs such as: *Community/Stakeholder perception*, *Trust, Equity*, *Income*, *Health*, *Biodiversity and species richness/density*, etc. All indicators listed under the Societal and Governance aspect were represented across the 38 tools. Stakeholder and community-related indicators were the most frequently covered, followed by governance and management (e.g. compliance, enforcement, administration, and costs) and policy and legislation. Other indicators appeared less frequently. Many of the tools reviewed originate from the International Union for Conservation of Nature (IUCN), including the Social Assessment of Protected and Conserved Areas, the Standardized Protocol for Evaluating Community Conservation Success, SAGE, the MPA Guide, the IUCN Green List, *How is your MPA doing?*, and the *Guide for quick evaluation of management in the Mediterranean* (Brichieri-Colombi et al., 2018; Franks et al., 2018; Grorud-Colvert et al., 2021; IUCN & WCPA, 2019; Pinto & Dehmel, 2023; Pomeroy et al., 2004; Tempesta et al., 2006).

In Chapter 5 we describe the tools we selected for implementation, which focus on the most common indicators listed above, namely stakeholder perceptions and equity/justice (i.e., SAGE, Justice Deliberation and Assessment, PEAR, Gender Equity tools), as well as governance-related indicators such as collaboration and knowledge integration (i.e., facilitated discussion method, QGIS + mapping tools). While the SAGE tool, facilitated discussion method and QGIS + mapping tools have been routinely applied in conservation settings, two new tools were developed within BLUE4ALL: the PEAR toolkit and the Justice Deliberation and Assessment tool, and one tool was applied for the first time (to the best of our knowledge): the MPA management gender equity tool. The following chapter introduces these tools along with the process of matchmaking between the LLs (or IS) and the respective research teams.

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

5. Tool Implementation

5.1 Introduction

Matchmaking between the LLs and the research teams was a process that took a few months and was based on several considerations: researchers' expertise on the specific topics/areas expressed as key priorities by the LLs/IS, time and capacity from both sides (LL representatives/CPs and researchers), and internal organization within WP2 and between WP2 and WP3 to ensure that all LLs in BLUE4ALL were covered.

Once the teams were formed, tool implementation was organized iteratively in each of the 8 LLs and one IS (Dundalk Bay) where a social-governance challenge was selected as a key priority (Table 3). To ensure coherence across the project, WP4 coordinated and facilitated the interactions with the LLs, and general principles of the collaboration were described in the Living Labs Testing Package (Dvorski et al. 2024). The full tool testing and validation process, including the preparation and implementation phases, is documented from a communicative perspective in more detail in D4.4 Tool Validation Report (Dvorski et al. 2025). Here we provide only a general description of how the tool co-creation process unfolded within Task 2.2 teams, recognizing divergences, namely in the Dundalk Bay IS case and the Capo Carbonara LL, where ongoing processes were linked to BLUE4ALL tool implementation.

Communication between Task 2.2 researchers and the LL contact points (CPs) and other LL representatives took place through online meetings and email correspondence. Through these conversations, the LLs' key priority area they wanted to focus on was matched to a specific tool, based both on the tool and indicator review mentioned above and the expertise from the researchers in each team. While the researchers suggested tools, methods and indicators, during these meetings feedback from the CPs and/or LL representatives on how the selected tools should be applied and improved was crucial.

The process of matching tools to the respective LLs and IS was guided by the priorities identified through the BA, the NA and other communication efforts, as well as the expertise of the research teams. In some cases, insights from the sociogovernance typology (section 2.3) were useful to guide such communication efforts. For instance, in one meeting with the Montenegro LL representatives

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

and the CP, the researcher used the typology to guide the conversation to arrive to a joint problem framing of the key governance challenge and feasible pathways to address compliance issues in one of the MPAs. The problem was re-framed as the two-fold aim to better understand the perceptions and level of awareness of the MPA among tourism stakeholders (Mobilization pillar, see Table 1), and to raise awareness to foster their engagement with the MPA (Communication pillar, see Table 1). This pointed to the Perception Elicitation and Awareness Raising (PEAR) tool as a suitable tool for this LL.

Table 3 summarizes the key priorities identified for social and governance tool testing for each LL and IS, the sources through which these priorities were identified (BA, NA, other), and the tools selected for implementation.

We categorize the implemented tools into Equity and Justice tools, namely SAGE and the Justice Deliberation and Assessment Tool; Perception Elicitation and Awareness Raising tools, of which the Gender Equity tool is a specific application; the Facilitated Discussion Method; and QGIS combined with participatory mapping. The following sub-sections describe these tools.

5.2 Equity and Justice Tools

Equity and justice issues are increasingly recognized as crucial in protection and conservation area management, including MPAs (Chung and Zheng, 2026; Bennett 2016; Bennet et al., 2025). While equity and justice are associated with different approaches, we see the terms as technically equivalent, as equity basically means fairness, which is closely related to social justice (see Franks et al., 2018). The need for equity and justice tools lies in the increasing attention and requirement for protected areas to be fairly managed as introduced in the 2004 Convention on Biological Diversity's (CBD) *Programme of Work on Protected Areas* (CBD, 2010). Goal 2.1 of the programme calls for the "promotion of equity and benefit sharing" (Schreckenberg et al., 2016). In 2014, the IUCN World Parks Congress further pressed for greater progress on enhancing the governance of protected areas, adopting rights-based approaches and "equitable management" dimension of Aichi Target 11 (WPC, 2014). In addition, the EU Biodiversity Strategy 2030 is committed to ensuring social equity, fairness and inclusiveness in line with the European Pillar of Social Rights (European

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

Commission, 2020)[2]. There are also national requirements for the authorities to address justice and equity in their decisions and actions.

Both the equity and justice-framed approaches identify three key dimensions: recognition, procedure and distribution (

Figure 3). Recognitional equity/justice takes into account the social and cultural differences that enhance or impede the full respect of groups of people, with their different positions in society and the specific needs and vulnerabilities as members of a particular community (Alba et al., 2020). Procedural justice/equity is about justice and equity in different decision-making processes. It looks at the equity of participation, transparency, impartiality and accountability of decision-makers to citizens. Distributive equity/justice focuses on the distribution of benefits and disadvantages in society. It also includes the means to reinforce the benefits of protection and compensate for the disadvantages (Adger et al., 2016).

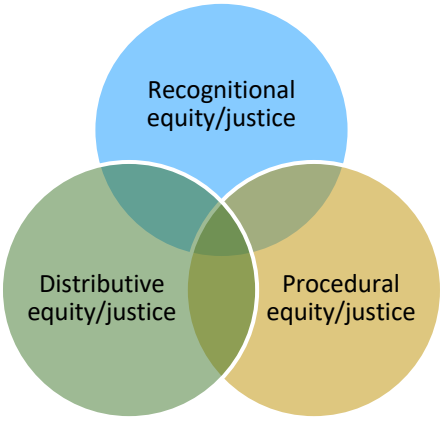


Figure 3 - The three dimensions of equity/justice.

Together they form the whole equity/justice assessment. The dimensions are interlinked and none of the dimensions alone ensures justice or equity.

We draw on the Site-level Assessment of Governance and Equity (SAGE) tool and the Justice and Deliberation and Assessment Tool to examine the practical challenges with their implementation in

[2] The European Pillar of Social Rights in 20 principles - Employment, Social Affairs and Inclusion

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

the contexts of Torre Guaceto MPA in Italy, and the Finnish and Baltic Sea MPA network as case examples.

5.3 Perception Elicitation and Awareness Raising Tools & The Gender Equity Tool

5.3.1 Perception Elicitation and Awareness Raising tools

The PEAR tools were applied in four LLs: Littoral Seino-Marin, Otranto-Leuca, Capo Gallo–Isola delle Femmine, and Katič. The tools elicit stakeholder perceptions and awareness levels to assess the degree of support for a conservation initiative and to identify the social, ecological, governance, or management aspects that shape these responses (Bennett, 2016). Understanding awareness and perceptions can inform strategies for reciprocal stakeholder collaboration and communication (Walton et al., 2013), helping to sustain local support, enhance equitable benefit sharing, and strengthen the legitimacy and acceptability of MPA governance (Bennett, 2016).

Perceptions are defined as "*the way an individual observes, understands, interprets, and evaluates a referent object, action, experience, individual, policy, or outcome*" (Bennett, 2016). The PEAR tools focus on eliciting perceptions across the four dimensions outlined by Bennett (2016): the scale and fairness of MPA social impacts, ecological outcomes and related community benefits, governance legitimacy, and social acceptability of conservation management and regulations.

Central to the PEAR tools is the recognition that awareness raising should be reciprocal. The tools not only inform stakeholders about the potential benefits of the MPA but also provide MPA managers with insights into stakeholders' perspectives. Accordingly, the PEAR tools aim to (1) assess awareness levels among target groups (which vary across LLs) regarding the MPA's existence and benefits, (2) elicit stakeholder perceptions of the MPA based on the four dimensions described by Bennett (2016), (3) raise awareness of the MPA among societal stakeholders, and (4) evaluate the methodological effectiveness of the tools. In doing so, the PEAR tools generate knowledge that can support effective and equitable MPA management, while also serving as a first step toward mutual awareness building between MPA managers and other stakeholders.

The methods applied within the PEAR toolkit differed across LLs but generally included four complementary methods: online surveys, semi-structured interviews, poster or flyer dissemination,

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

and a joint evaluation of tool implementation. Surveys and interviews were used to elicit perceptions and awareness, and covered themes related to Bennett's (2016) four dimensions. Posters and flyers encouraged survey participation and were a crucial step toward mutual awareness raising. Target groups varied depending on the LL context.

The joint evaluation of the tool implementation took several forms depending on the LL. Lessons learned were shared with both internal and external LL partners and addressed research findings, methodological insights, and implications for practice. Internally, partners were asked to reflect on the process, consider which lessons could inform management, and assess the extent to which the needs of the MPA had been met. Some LLs also organized interactive events, such as workshops or public presentations, to share results externally with societal stakeholders and to co-create initial steps for applying the findings.

Tool implementation and reflection processes were adjusted in each LL to account for its specific context and needs. Consequently, the execution of the PEAR tools and the reflections presented in the following sections differ across LLs. The sections describe the tools' implementation, results, and LL-specific reflections for the four LLs. The 'Conclusion' chapter provides a joint reflection on the overall application and effectiveness of the PEAR tools.

5.3.2 The Gender Equity Tool

The Gender Equity tool is an adapted and specified component of the PEAR toolkit. This tool aims to elicit gendered perceptions of participation in the use and management of an MPA. It combines Bennett's Perceptions Framework (2016) with Feminist Political Ecology (Rocheleau et al., 2013). Anariba et al. (2025) developed a self-assessment tool for evaluating gender equity in MPA management based on five indicators: gender roles and power relations, gendered uses and values, gendered knowledge and priorities, gender responsive management design, and gender inclusive management design. These indicators form the methodological basis for the tool.

The tool consists of two surveys followed by a presentation of results to the relevant stakeholder groups. The first survey targets stakeholder (engagement) groups and elicits perceptions of gender equity in MPA management. The second survey targets tourists and examines perceptions of how well gender specific needs are addressed, including access to and experiences during tourism

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

activities. Furthermore, semi-structured interviews are conducted with relevant stakeholders and operators. These interviews explore gendered access to livelihoods and operators' perceptions of gender differences in the MPA.

5.4 The Facilitated Discussion Method

This tool is a structured form of facilitated discussion method to support constructive dialogue among MPA stakeholders. The method can be applied at any stage of the MPA planning, implementation, management or review cycle. It begins by engaging each stakeholder group separately to reflect on their relationship to the MPA and to identify key past moments that influenced their situation. A second step brings representatives from different groups together for a facilitated discussion. The facilitator brings in the main themes that emerged from the individual conversations, which then guide the collective dialogue. This joint discussion helps identify tensions, shared interests and opportunities for collaboration, contributing to more inclusive MPA management.

5.5 QGIS and Participatory Mapping

This tool combines participatory stakeholder engagement with spatial analysis using Quantum Geographic Information System (QGIS). It supports MPA managers in revising protection zones by integrating ecological, socio economic and political information into a single decision support system.

The process begins by discussion among institutional representatives, local actors and experts. Through a series of workshops, these stakeholders identify priority habitats and assess different protection levels. Key local stakeholder groups are included so that zonation proposals also reflect their socioeconomic needs. The aim is to develop zonation options that are environmentally, socially and economically acceptable.

Spatial datasets such as habitat maps, ecological monitoring results, resource use patterns and political constraints are compiled in QGIS. QGIS generates a synoptic map, representing a new draft zonation proposal. This map is then used during workshops to support collaborative discussion and adjustments of zonation options. This interactive format helps stakeholders understand how zonation changes may affect different groups.

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

The process concludes with a collective review of the new draft zonation proposal. Stakeholders can again suggest adjustments directly on the printed maps or during discussion. The final proposal can be shared in a public workshop.

Table 3 - Key social and governance priorities for tool implementation, based on the Baseline Assessment (BA), Needs Assessment (NA) and Interactions with CPs, for each LL/IS.

Living Lab / Information Site	Source Priorities (NA, BA, other)	Sociogovernance Priorities for Tool Implementation	Tool(s)
Torre Guaceto MPA	BA; Direct contact WU & CP	Understanding root causes of illegal fishing by addressing them through an equity lens	SAGE
Finland's MPA Network	NA; feedback Working Group (WG) BIODIV	Developing strategies to effectively assess social and equity dimensions of marine conservation	Justice Deliberation & Assessment tool (tested)
Baltic Sea MPA Network	Validation of tool tested in Finland	Developing strategies to effectively assess social and equity dimensions of marine conservation	Justice Deliberation & Assessment tool (validated)
French MPA Network Littoral Seino-Marin	NA	Raising awareness and understanding stakeholder perceptions; need for effective and regular communication with citizens and officials	PEAR tools
Otranto-Leuca MPA	NA	Understanding tourism stakeholders' perceptions and awareness of the proposed MPA; raising awareness of stakeholders about the benefits of the MPA establishment	PEAR tools
Capo Gallo-Isola Delle Femmine MPA	NA; Workshop on "gender dimensions in EU projects"	Raising awareness and understanding of tourism stakeholder perceptions; improving participation and dialogue among MPA stakeholders; understanding gender differences in MPA use and management	PEAR tools + Gender Equity tool
Katič MPA	NA	Raising awareness and understanding stakeholder perceptions to improve compliance with jet ski speed limits	PEAR tools

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

Dundalk Bay	General results BA	Improving stakeholder recognition, equity and participation throughout the MPA management process	Facilitated Discussion Method
Capo Carbonara MPA	BA + NA, independent monitoring activities	Updating georeferencing of the current zones to reflect the most recent ecological knowledge; including socioeconomic dimensions in MPA re-zonation	QGIS + Participatory Mapping

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

6. Results of Tool Implementation

6.1 Site-Level Assessment of Governance and Equity in the Torre Guaceto MPA (IT)

6.1.1 Introduction

Italy has a long coastline affected by anthropogenic pressures like fisheries and other economic activities, with several MPAs recently established or being expanded to mitigate these (Russi, 2020). Many areas that are or will be designated as MPAs (or in which management might be tightened) have fisheries and other activities in them, which could create negative implications for these users.

Established in 1991 on the Adriatic coast of southern Italy, in the Apulia region, the Torre Guaceto MPA covers approximately 22 square kilometres and includes both terrestrial and marine environments. The MPA is divided into three different zones: A, B and C, each offering specific regulations and levels of protection to balance conservation and resource utilization (Figure 4). These zones include strictly protected areas (A) and other areas (B and C), where different regulated activities such as fisheries are permitted (Russi, 2020).

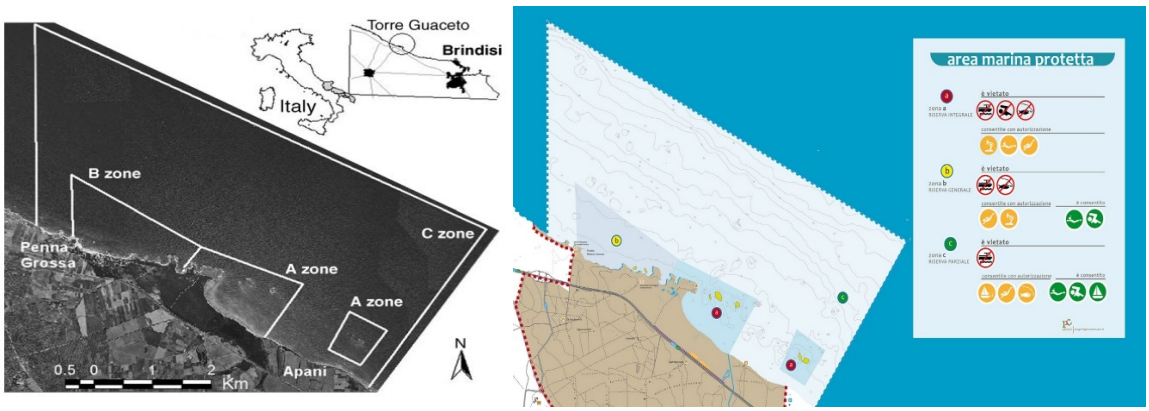


Figure 4 - Map of Torre Guaceto MPA showing designated zones A, B and C. Source: https://www.riservaditorreguaceto.it/index.php/it/l-ente-gestore/zonizzazione/la-zonazione-dell-area-marina-protetta

The path towards setting up the MPA's governance has been turbulent, as reported elsewhere (see Russi, 2020, Freeman et al., 2018). Upon the designation of the MPA in 1991, fishing in the area was restricted, but without enforcement, essentially making Torre Guaceto a 'paper park' till the year

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

2000. In 2000, a managing consortium consisting of municipalities (Brindisi and Carovigno) and WWF was formed and imposed a four-year ban on fishing, acting on warnings about fish stocks from researchers (Guidetti et al., 2010; Freeman et al., 2018; Russi, 2020). The ban was enforced but resulted in serious conflicts with the fishers that had been banned from the area. Despite the conflict, the management consortium partially lifted the fishing ban in 2005 after which relations between the actors in the governance system have started to restore. Today, the Torre Guaceto MPA is considered to be a good example of the deployment of governance strategies allowing the MPA to cater to environmental concerns as well as to the interests of small-scale fisheries and wider socio-economic priorities (Russi, 2020). The MPA can therefore provide insight into strategies for MPA governance to apply elsewhere.

While there were no NAs conducted in the MPA, the BA and further interviews with key stakeholders highlighted the need to deal with illegal fishing activities, especially from recreational fishers. The SAGE tool was implemented to examine the status of the current MPA management practices from the perspective of relevant stakeholders to understand the root causes of illegal fishing activities and discuss ways to address them through the lens of equity. Understanding stakeholders' perceptions of governance and equity in the MPA management could help enhance social acceptability of MPAs, and the development of mechanisms to improve governance. We also reflect on the practical challenges of utilizing the SAGE methodology as a management assessment tool in a local MPA context. As the next sections will show, in terms of the typology of sociogovernance processes, the focus of this SAGE tool implementation was a bottom-up process of generating *'knowledge and understanding'* of the levels of equity and governance and exploring how this interacts with 'engagement and participation' to develop 'interventions (actions)' for enhanced equity and governance of the MPA.

6.1.2 Tool Description/Method(s)

SAGE is a tool for assessing the governance and equity of protected and conservation areas including MPAs (Franks, 2023). SAGE assessment and application is based on a set of ten governance principles following the IUCN framework of equitable governance principles for protected areas, which are grouped into three main dimensions of equity (Section 5.2) and a fourth general

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

governance principle (see Table 4 (Franks, 2023; Echeverri et al., 2021). In short, the SAGE methodology enables site-level actors to assess and improve the governance and equity of their conservation work to improve both social and conservation outcomes.

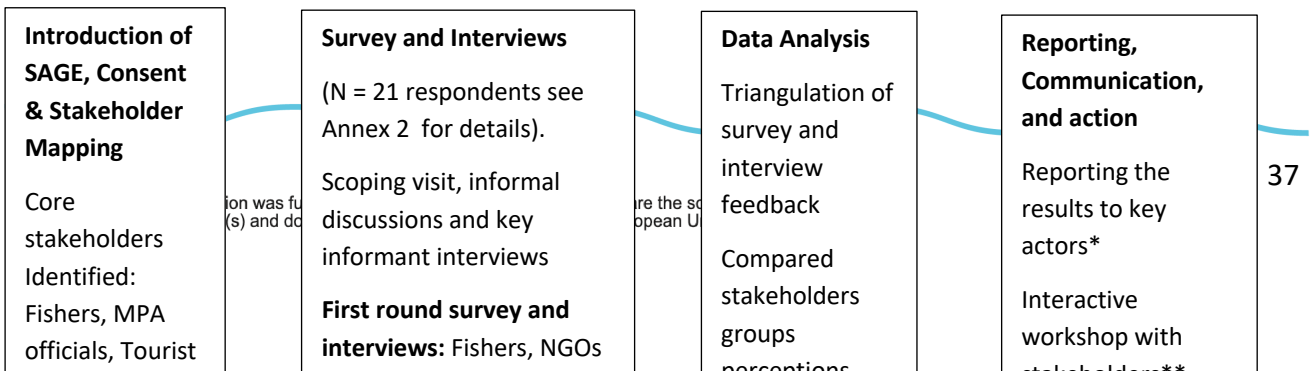
Table 4 - Framework of equitable governance 10 principles.

Principals	Description
Recognitional Equity	Recognition and respect for the rights of all relevant actors
	Recognition and respect of all relevant actors and their knowledge
Procedural Equity	Full and effective participation of all relevant actors in decision-making
	Transparency, information sharing and accountability for actions and inactions
	Access to justice, including effective dispute resolution
	Effective and fair law enforcement
Distribution Equity	Effective measures to mitigate negative impacts on communities
	Benefits equitably shared among relevant actors
Others	Achievement of conservation and other objectives
	Effective coordination and collaboration between actors, sectors and levels

The SAGE methodology involves two main phases (known as the assessment phases) followed by a third phase which involves the implementation of actions towards more equitable MPA governance (Figure 5 - The three phases of SAGE. Source: Franks, 2023Figure 5Figure 5). The main part of the assessment phase involves the use of a multiple-choice questionnaire based on the ten governance indicators which are adapted to the site's context and a synthesis workshop to discuss the results and potential pathways to improve governance.

Figure 5 - The three phases of SAGE. Source: Franks, 2023

The key steps in applying the SAGE tool in the Torre Guaceto MPA have been:



** Final results are also shared with BLUE4ALL partners to help in developing a platform of tools for better MPA governance.*
***Outstanding tasks.*

6.1.3 Main Outcomes/Results of Tool Implementation

The Torre Guaceto MPA demonstrates that synergies exist between conservation objectives and the interests of other stakeholder groups such as fishers and tourist operators. For instance, the weekly authorization for the formally regulated small-scale fishers has made it possible for fishers to meet with MPA officials weekly and discuss suggestions on ways to deal with illegal fishing activities and the catch levels.

In terms of stakeholders' assessment of the governance indicators, there were generally high scores and high levels of consensus among stakeholders across the governance indicators. However, there were some variations. For scores across the governance principles, 'negative impact mitigation' had the highest mean score whilst dispute resolution had relatively low mean score as shown in Figure 6 and

Error! Reference source not found.. This suggests the need for more discussions among stakeholders on ways to improve dispute resolution processes.

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

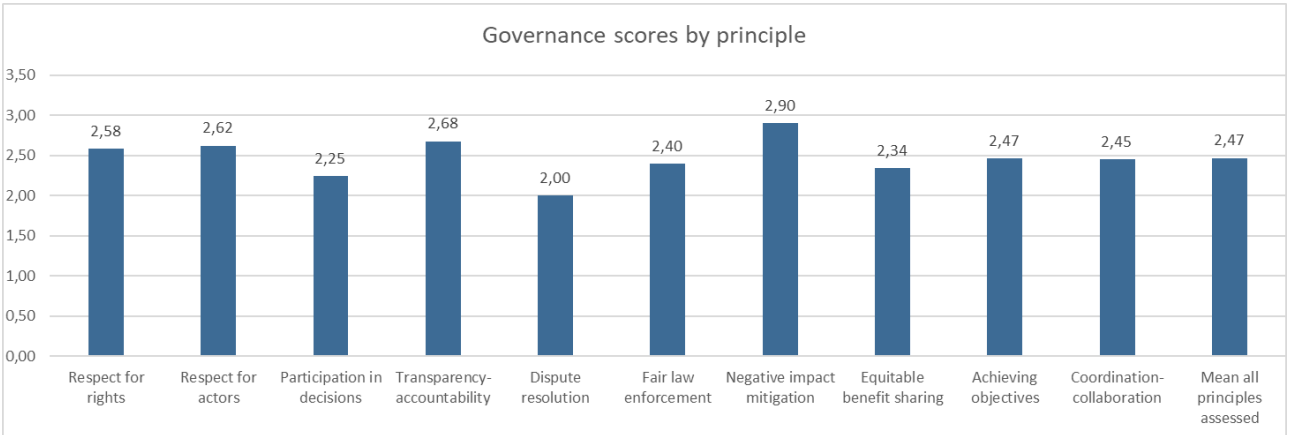


Figure 6 - Results of average governance scores by the SAGE Principles

In terms of consensus among stakeholder groups, there was high consensus between actors on governance issues relating to respect for actors, participation in decision-making and negative impact mitigation as shown from

. This supports the interview results that show that the MPA has developed strong trust among actors, which could suggest high agreement on recognitional and some aspects of procedural equity. The governance issues related to dispute resolution, fair law enforcement and equitable benefit sharing had low consensus. This requires further discussions during the synthesis workshop with stakeholders to understand why actors such as MPA officials provide low scores for dispute resolution, but fishers and tourist operators provide higher scores and ways to improve it. The same is done for the other dimensions of equity with low consensus.

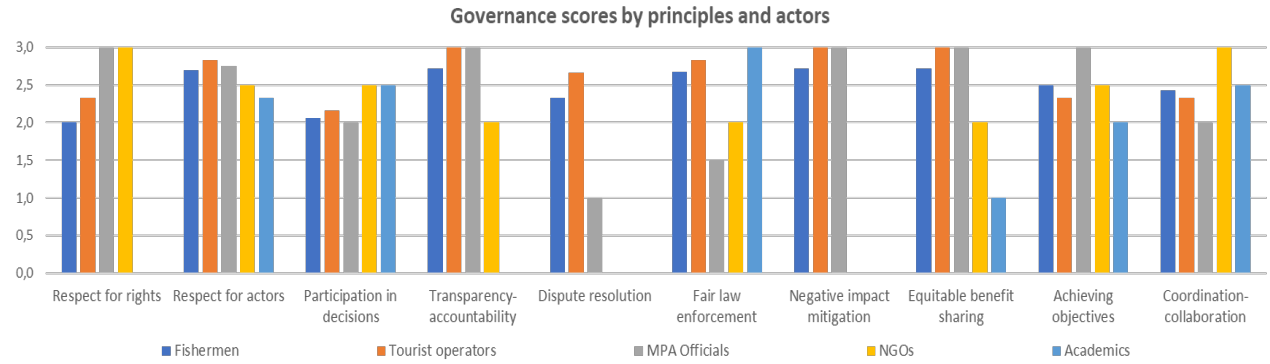


Figure 7 - Results of governance scores by SAGE Principle per actor group

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

6.1.4 Reflections

The SAGE tool application as a multistakeholder process can be applied in various MPA contexts, although a preparatory phase (stakeholder analysis and mapping, and adaptation to the MPA context) and understanding of the assessment process by stakeholders is needed.

Some challenges were faced in the SAGE tool implementation in our case study. First, the MPA did not participate in the NA process organized by the BLUE4ALL consortium. In the absence of the NA, the case study team mainly relied on the BA (the first primary assessment of MPAs) which was largely based on informal discussions, a literature review and existing documents. Our scoping visit and informal discussions with key stakeholders of the MPA were further attempts to understand the MPA and decide on what tool could be implemented to improve governance.

The role of local facilitator(s)/contact persons is essential for assessing the governance principles, prioritizing survey questions to fit the context and language adaptation. However, our limited interactions with the MPA, and the fact that the case study team did not speak Italian and had limited local connections with other stakeholder groups made it difficult to fully engage with them upon completion of the survey assessment. This mostly resulted in misunderstandings of the survey results and low ownership of the tool by the key stakeholders.

Finally, some of SAGE's equity and governance indicators may not be entirely reflective of the local context. Some could also be problematic to discuss with stakeholders, creating conflicts rather than improving governance. For instance, questions of 'rights to access' were seen by some stakeholders as risking creating the perception among stakeholders that their rights are being affected. Early interactions with stakeholders on the meaning of such concepts and further discussions during the reporting and communication phase could help address some of these challenges and improve the tool implementation.

SAGE is inherently designed for assessing equity and governance for single protected areas and may not be suitable for MPA network assessment. In addition, the local contexts of equity and governance may vary, making it difficult to compare indicators across multiple MPAs. SAGE implementation also requires the existence of MPA management body with an existing plan on the

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

MPA management including stakeholder participation. In OECMs where there may not be such management bodies, it would be difficult to assess equity and governance.

6.2 Justice Deliberation and Assessment Tool Implementation in Finland's MPA Network

6.2.1 Introduction

Finland published a national roadmap for the development of an MPA network in autumn 2025[3]. The roadmap presents 34 actions through which the protection of marine areas in Finland can be enhanced and the network of protected areas can be realized by 2030. The presented actions respond to the challenges occurring in the current MPA network. The actions will enable the Ministry of the Environment, regional environmental administration and other stakeholders to promote the development of an ecologically comprehensive, well-connected and fairly managed MPA network. The actions also aim to promote the achievement of international nature conservation objectives. The connected network of MPAs to be achieved by 2030 builds on existing protected areas.

One of the actions in the roadmap is to include considerations of justice and equity in conservation planning. This action is an outcome of BLUE4ALL's LL activities in Finland. The LL consists of experts involved in preparation of the roadmap. They work in nature conservation administration on different levels, in research organisations and Non-Governmental Organisations (NGOs). During the BLUE4ALL's NA we identified key knowledge gaps related to the MPA network. One set of gaps concerned social and political dimensions of nature conservation, including topics like social and economic impacts and acceptability. To respond to this knowledge gap, the involved BLUE4ALL team started to develop a tool for addressing justice and equity in conservation planning and management. The tool is called the "Justice Deliberation and Assessment Tool".

The NA and tool development included workshops and a survey with the LL members, a survey of a broader group of stakeholders and interviews with nature conservation experts that were not

[3] Suomen merensuojelualueverkoston kehittämisen tiekartta vuoteen 2030 : Kohti vaikuttavaa meriluonnon suojelua

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

involved in the LL activities. A draft tool was also presented to HELCOM's biodiversity working group for feedback from nature conservation experts in other Baltic Sea countries.

Note that we did not test an existing tool because the few existing tools, such as the SAGE tool, are designed for single protected areas that have already been designated. Finland's LL was, in fact, a national level process to prepare the MPA network roadmap, not linked to a single established MPA. We took this opportunity to work with MPA experts to prepare a new tool for addressing justice and equity in MPA networks.

6.2.2 Tool Description/Method(s)

The Justice Deliberation and Assessment Tool (see Annex 3) presents a process and a set of questions to address justice and equity in MPA planning and management. The tool also includes instructions for its use, such as advice on how to acquire answers to the given questions. The tool is built on previous work on justice assessments, especially on Kivimaa et al. (2023) regarding assessment questions and Bennett et al. (2025) regarding the process. The tool is based on the conceptualization of justice along three dimensions as described in Section 5.2.

The tool aims to improve the information base of nature conservation planning and management and creates opportunities for resolving conflicts. It promotes dialogue about equity and justice and provides means of incorporating these concepts in nature conservation planning and management. The tool brings new perspectives to current conservation planning and implementation practices, but, in many respects, the components of the tool address topics that are already addressed in current conservation. The tool helps summarizing and synthesizing various sociocultural and participatory aspects. The tool proposes a process for assessing and deliberating on justice and equity (Figure 8). An important feature of the process is that the actual assessment (right hand side steps) should be followed by deliberative steps on the left to draw conclusions and take actions to improve justice.

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

Figure 8 - The Justice Deliberation and Assessment Tool .Steps of the assessment to be modified to fit the regular conservation and planning practice. The steps in blue boxes depict a process to plan and conduct justice assessment and the steps in green boxes a process of drawing conclusions, taking actions and monitoring. Modified from Bennett et al. (2025).

The tool presents assessment questions for each dimension of justice: recognitional justice, procedural justice and distributive justice. The questions address the following topics (Table 5 5).

Table 5 - Topics addressed in the questions that guide deliberation and assessment of conservation justice.

Recognitional justice	Procedural justice	Distributive justice
• Equality • Impacts on socio-economic vulnerability • Coastal communities' resilience and way of life • Taking into account a range of values, knowledge and backgrounds • Non-discrimination	• Equal opportunities for participation • Informed decision making and justification of a conservation decision • Ex-post monitoring of impacts and appeals • Inclusiveness of participatory arrangements • Participation opportunities for young people and consideration of future generations	• Distribution of impacts on livelihoods and basic needs • Distribution of impacts related to work and economic activity • Distribution of health benefits and harms • Distribution of environmental benefits and harms • Other justice impacts and their distribution • Justice implications for other countries

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

There are 16 headline questions, one for each topic, that are each presented with some clarifying prompts. The tool document also gives illustrative examples of possible answers to the questions. Here follows an example of how the tool presents the questions and related advice:

RJ2: Impacts on vulnerability

Main question	Supporting questions to allow a comprehensive assessment of the impact of conservation decisions on vulnerability:
How do conservation decisions affect the vulnerability of individuals or groups of people? (Also related to questions PJ4 and DJ1)	• How are the existing vulnerabilities of individuals or groups of people identified? • Do conservation decisions create new vulnerabilities? • Are there clusters of vulnerabilities for certain groups? • How existing or foreseen vulnerabilities can be reduced by adapting conservation decisions or other measures

Identifying and addressing vulnerabilities is important for justice, but the concept of vulnerability should be used with discretion. Labelling a group of people as vulnerable can only be made if the people representing the group have identified themselves as such. Even then, judgement should be exercised as to whether designation as vulnerable is necessary, as it may also cause harm.

In monitoring and self-assessing vulnerability impacts, the following options can be used to outline examples of the need for further participation or research:

a. Conservation decisions reduce the vulnerability of different groups of people and support the adaptive capacity of all on an equal basis. [On what grounds?]
b. Conservation decisions reduce the vulnerability of some individuals/groups of people, but do not necessarily support the adaptive capacity of all equally by limiting opportunities to practice some occupations locally. [In which ways it may be limited?]
c. Conservation decisions may increase the vulnerability of some individuals/groups of people, but conservation decisions have been adapted/other specific measures have been designed to prevent vulnerability. [In which ways?]
d. Conservation decisions are likely to increase the vulnerability of individuals/groups of people. [In which ways?]
e. It has not been possible to assess the impact of conservation decisions on the vulnerability of groups of people. [Why not?]
f. The question is not relevant or was not addressed because...

Note! The options are given as illustrative examples that may need to be adjusted and rephrased to fit the context. If self-assessment or monitoring using options are to be reported, it is important to provide a careful justification of why the situation is as described and on what the evaluation is based. Hints for reporting are given after questions in square brackets [...].

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

6.2.3 Main Outcomes/Results of Tool Implementation

Overall, the reception of the tool has been positive. The topics of justice and equity were considered relevant to include in conservation planning and management. Also, the tool itself has been found useful for structuring participatory processes and clarifying justice-related issues.

A few critical observations were made during the stakeholder interactions. One critical notion relates to the required skills for tool implementation. The tool proposes that justice and equity should be addressed as part of "normal" conservation planning and management, not as a separate or additional task. Although this proposal was welcomed, stakeholders recognized that the conservation planners and authorities do not necessarily have the skills required to address sociocultural topics. Usually, they are trained as natural scientists. Stakeholders proposed to organize training for using the tool, which would be most effective in the pilot phase.

Another critical comment related to the possible misuse of equity assessment results. Some actors may use the assessment results for arguing against nature conservation, if they show problems with justice or equity. The politicization of the equity assessment is a significant concern, and such situations are challenging to avoid. To respond to this concern, the tool implementation process underlines the importance of deliberation on the assessment results. This means drawing conclusions from the assessment in a participatory process that also designs corrective measures. Thus, the assessment should not end in the publication of the results without follow-up actions.

6.2.4 Reflections

Tool implementation was conducted by the LL members and occasionally with broader sets of stakeholders. However, the people that we engaged with were mostly nature conservation oriented. For instance, two surveys were distributed to existing networks. One of them was a large stakeholder network focused on marine conservation and the other network was fisheries oriented. We got 20 responses from the marine nature conservation network and only three from the fisheries network. In future tool implementation, it would be important to have inputs from people outside of the nature conservation circles.

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

6.3 Justice Deliberation and Assessment Tool Validation in the Baltic Sea MPA Network

6.3.1 Introduction

The Baltic Sea MPA network (DK-S-FIN-(RUS)-EST-LV-LT-PL-D) is a regional level network of MPAs that spans the Baltic Sea. The network includes several types of protected areas, including Natura 2000 sites, HELCOM MPAs, Ecologically or Biologically Significant Marine Areas, Ramsar Sites, UNESCO sites, and privately owned areas (Finland and Sweden). The MPAs are spread across all the Baltic Sea nations and are controlled by national level legislation and administration.

Some key needs, which have been addressed within prior work in BLUE4ALL under WP1 (Bouvet et al., 2023), are tied to the fact that the Baltic Sea MPA network does not exist as an entity controlled by one authority. Rather, the Baltic Sea MPA network represents all the nations' protected areas. These nations have limited collaboration with each other. However, the Baltic Marine Environment Protection Commission (HELCOM), an Intergovernmental Organization, aims to provide a platform for these countries to move towards effective transboundary efforts to manage the environmental issues which face the Baltic Sea today.

No tool is actively being 'tested' within the LL due to the vast size of the MPA network. Rather, relevant tools were 'validated' by the SEG for the LL, which is the HELCOM Working Group on Biodiversity (WG BIODIV). As a high-level Working Group, several associated Expert Groups fit within the umbrella of the WG. As such, the Expert Group on MPAs has been approached for comment on the validation stage of the relevant tools selected.

6.3.2 Tool Description/Methods

As part of the tool validation process, it was agreed that once the Justice Deliberation and Assessment tool was finalized within the Finnish MPA Network LL, it could be passed on to WG BioDiv for further consideration within the regional network.

Within an information document supplied to the WG BioDiv group before a meeting, BLUE4ALL colleagues requested that the group take a series of actions, copied below from the meeting memo:

The Session is invited to:

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

- *Consider the justice deliberation and assessment tool (*Figure 8*); contribute to the validation process for the MPA equity and justice tool by discussing the following questions;*
- *What added value do you see for the tool in the process of planning and implementing marine nature conservation? What needs do you think the tool could address? Please, consider the added value for national contexts and for HELCOM's activities on marine conservation.*
- *What challenges or risks do you see for a possible application of the tool in your country's context? How could the assessment tool be developed to avoid risks? Please, consider the challenges or risks for national contexts and for HELCOM's activities on marine conservation.*
- *How does the assessment tool apply in your country's context, taking into account, for example, how nature conservation planning and management are organized and what assessments are already conducted?*
- *Discuss how the justice deliberation tool could be taken into regional HELCOM work.*

6.3.3 Main Outcomes/Results of Tool Implementation

With these questions in mind, the presentation of the tool was given during the meeting, and the following written comments were supplied from the live discussion within the Meeting Memo:

'5.28 The Session considered the validation process for MPA equity and justice tool by BLUE4ALL (CMNT document 5-13, presentation 5). In discussion the Session noted:

a. *Several Contracting Parties welcomed the work on the topic and noted the need to build capacity and competency among marine managers in charge of running stakeholder involvement processes in MPA designations on this topic;*
b. *MPA designation processes that involve stakeholders that could be impacted by the decision are established, regulated and participatory. However, there could be room for improvement in taking equity and justice considerations into account more explicitly. The tool could support identifying the aspects more clearly by synthesising information that is already handled in the processes;*
c. *Finland proposed that the topic of equity and justice could be considered in the update of Recommendation 35/1 on the MPA network;*

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

d. *WWF welcomed addressing the justice perspective in conservation planning and recalled that PROTECT BALTIC discussions with MPA managers had identified must-haves related to stakeholder engagement and the tool could support work on how best to engage stakeholders and share best practice.'*

Note that for point c. Finland made a recommendation to consider equity within a key official Recommendation document (35/1) which outlines what should be considered within the Baltic Sea's MPA network (see here: https://helcom.fi/action-areas/marine-protected-areas/background-of-helcom-mpas/ for more details). This is significant as there is little recognition of social issues within this current version of the Recommendation. Moreover, in point d., WWF mentioned the potential for future consideration of these aspects within other projects, which increases the longevity of the work done in BLUE4ALL.

As a follow up to this, the point on equity was taken up during the Autumn meeting of EG MPA (the expert group on MPAs) and it was proposed that the topic of equity and justice within MPAs should to be considered within the update of the Recommendation, and that this shall be discussed in more depth during the following EG MPA meeting scheduled for February 2026:

e. *next EG MPA session (IC EG MPA 9-2026) will discuss among other issues: Recommendation amendment needs stemming from IC WG BIODIV 5-2025 where the topic of equity and justice was proposed to be considered when updating the Recommendation on the MPA network.*

6.3.4 Reflections

The tool implementation process has been complicated for the Baltic MPA network due to the high level of bureaucracy associated with the LL. However, this tool was an exception. Due to its successful development and application to the Finnish national context, its transferability to another bureaucratic setting in the transnational network of HELCOM was successful. The purpose of the HELCOM Secretariat is to bring each Baltic nation together to discuss the transboundary issues which the Baltic Sea faces. Equity issues are extremely relevant and prevalent within MPAs and other spatial protection measures. As a result, the BLUE4ALL project was able to bring forward a tested tool which was already supported by a Baltic state, and was therefore transferable to the trans-Baltic context. Whilst we do not see concrete results in the sense of equity being immediately

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

up taken by the other states, we see a clear interest and push to formalize this aspect into policy (Recommendation 35/1) in the near future.

6.4 PEAR Tools in the Littoral Seino-Marin MPA (FR)

6.4.1 Introduction

The MPA Littoral Seino-Marin (LSM) is located in Normandy, in the Seine-Maritime Department (

). It is one of the 38 Natura 2000 marine sites of the Network along the English Channel and the North Sea coast of France. The OFB coordinates the MPA network. LSM was selected as the pilot site for BLUE4ALL's tool implementation after consultation among the Wageningen University (WU) and University of Antwerpen researchers, the CP the LL and SEG.

LSM stretches 70 km along the coast and covers 180 050 hectares. Most of its area is marine, with only 1% terrestrial (mainly cliffs and pebble beaches) (INPN, 2024). The first decree about the MPA's establishment was signed in 1990. In 2013, a ministerial decree officially designated it as a Natura 2000 SPA (Special Protection Area) for the ecological values derived by the presence of 43 bird species that use this site for reproduction and nesting (OFB, 2023). Many activities, like commercial fishing (OFB, 2020), recreation, transport and wind farm development take place in LSM. All these activities generate threats to the ecosystems and birds (OFB, 2023).

During the NA, the SEG identified communication tools to raise awareness as a priority. At LSM, levels of stakeholder awareness and perceptions of the MPA were unknown. Therefore, the PEAR tools were applied for the tool implementation in LSM. Two stakeholder groups were selected by the SEG as the target audience: residents living on the coast adjacent to the MPA and elected officials in the municipalities.

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

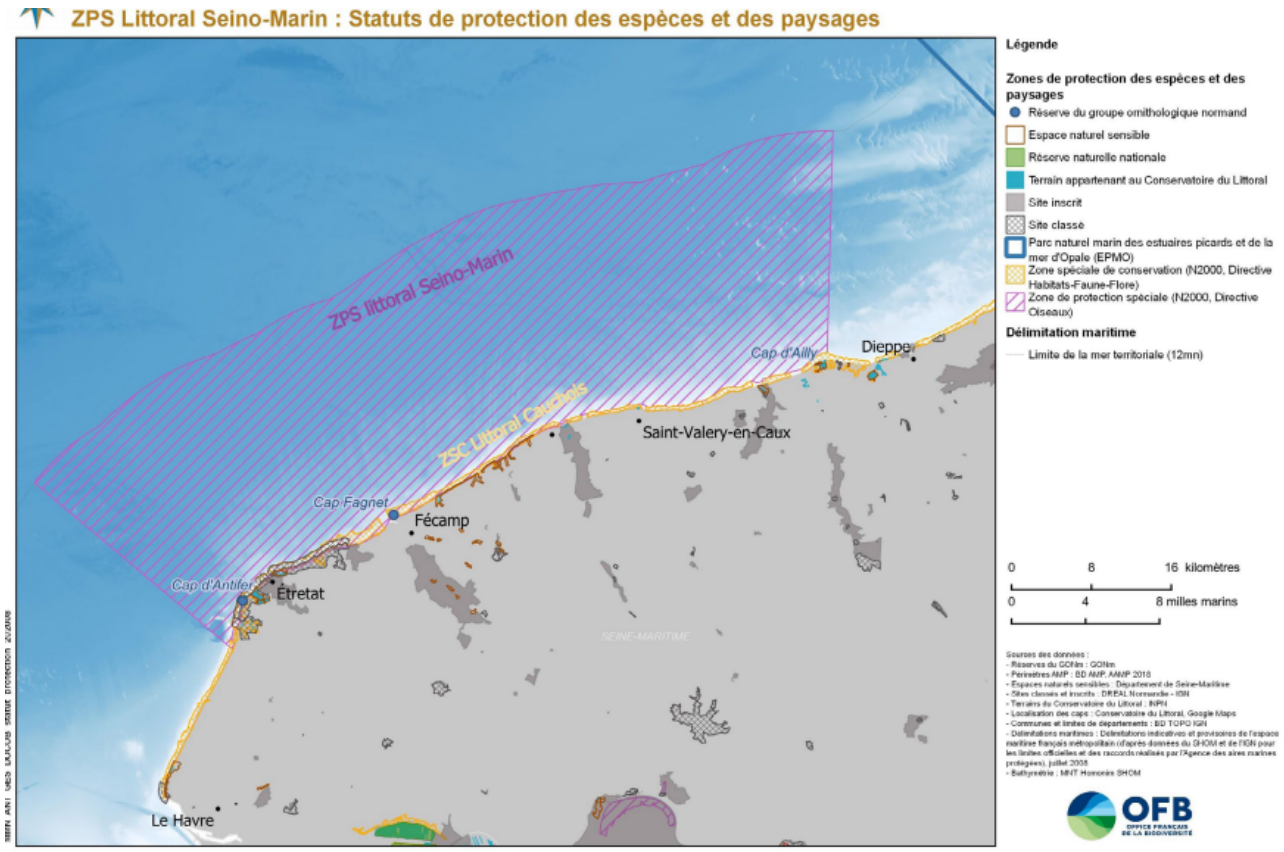


Figure 9 - Map of the Littoral Seino-Marin MPA area (OFB, 2020).
Source: https://www.donnees.normandie.developpement-durable.gouv.fr/pdf/N2000/FR2310045DOCOB.pdf

6.4.2 Tool Description/Method(s)

The PEAR tools encompassed surveys, poster dissemination, semi-structured interviews, and a workshop. Residents' perceptions and awareness were elicited through online French and English surveys. These surveys also included basic information about LSM to start raising awareness about the MPA. Posters and flyers with a QR code linking to the survey, a workshop invitation and an informational booklet on the protected bird species were distributed in public places in all municipalities within the MPA. In total, 38 posters and 1211 flyers were distributed. For each municipality that expressed interest in keeping in touch, a note was made for future engagement efforts.

Elected government officials' perceptions and level of awareness were elicited by means of semi-structured interviews. During the interviews, information about LSM, along with a booklet on

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

integrating the MPA in political campaigns, was provided. Interviews were conducted with four government officials from four municipalities (out of 29).

Lastly, a workshop was designed to raise awareness about the role of the MPA and allow the attendees to reflect on how their activities affect the birds. Interactive activities were planned between MPA managers and attendees (residents and officials) to start relationship-building and plan future engagement. Unfortunately, no participants attended the workshop.

6.4.3 Main Outcomes/Results of Tool Implementation

The Local Community's Relationship to the Marine Environment

Most respondents are active within the marine environment. Recreational fishing was the most practiced activity, followed by canoeing-kayaking. The majority strongly agreed that practicing these activities provides benefits like relaxation and social belonging.

The Local Community's Awareness and Perceptions of the MPA

The local community demonstrated low awareness of the LSM MPA, its objectives and regulations. Fewer than half of respondents knew of the MPA's existence, and among them more than half were unaware of its objectives. None were familiar with its regulations.

Despite this, attitudes towards regulation were generally positive. More than half of the participants strongly agreed that more regulations should be implemented, often framing this as a moral duty to protect nature or highlighting people's dependence on nature. Others supported regulation on the condition that they can still practice their recreational activities. In contrast, a small number opposed regulations, arguing that existing rules are overlapping and already limiting their freedom. Some of these respondents suggested focusing on education rather than additional restrictions.

The Local Community's Future Involvement

Engagement with MPA-related activities was low. Only five respondents had taken part in initiatives organized by the OFB. However, nearly half expressed willingness to become more actively involved in conservation (Annex 4, Figure 21). Suggested activities included beach clean-ups, waste collection, and collaboration with local environmental organizations. Motivations for engagement included a sense of civic responsibility and environmental appreciation.

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

Interest in communication with the MPA manager was low (Annex 4, Figure 22). About half were indifferent to establishing contact, sometimes mentioning lack of time. Only two respondents were highly interested, highlighting that communication helps them understand how to behave in the MPA. Preferred communication methods included newsletters, websites, and workshops. The findings suggest that while the community is willing to contribute to environmental protection, it does not necessarily view collaboration with the OFB as essential to this.

Government Representatives' Awareness of the MPA

All interviewed representatives were aware of the LSM MPA. However, besides awareness of restrictions on fisheries, their understanding of its regulations and objectives was low: only half correctly identified the main target species.

Government Representatives' Perceptions of the MPA

Interviewees universally considered protection as the main role of the MPA, though the perceived focus of protection varied (Annex 4, Figure 20). Some associated the MPA's protective role with flora and fauna, another specifically with birds, and one interviewee mentioned protecting societal benefits. The results thus indicate that elected representatives recognize the MPA's protective function but sometimes lack a detailed understanding of what features it protects.

The participants also had different perceptions of the local sectors. Three elected representatives believed the MPA has authority to regulate fisheries. Species protection was seen as inseparable from fishery management, with industrial fishing vessels regarded as a major threat. Regarding the tourism sector, there was consensus that tourists are generally unaware of the MPA's existence and objectives. Moreover, recreational activities such as jet skiing and kitesurfing were perceived as disturbing the marine environment, and the interviewees were open to stricter regulations. Recreational fishing, however, was seen as a minor threat, with representatives only accepting soft regulations. Agricultural practices were considered harmful, particularly due to runoff and cliff degradation, and discussing with farmers was described as challenging. The interviewees universally opposed windfarms, as they are being perceived as harmful to biodiversity.

According to the interviewed representatives, the local population generally lacks awareness of the MPA or sometimes perceives it as a constraint. This relates to the interviewees' perceived trend of

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

decreased physical and psychological connection to the marine environment. The interviewees also observed a decline in the perceived (intrinsic) value of nature by the local population.

Government Representatives' Future Involvement

Although most municipalities already conduct activities related to marine conservation, these are not necessarily tied to the MPA. However, all interviewed elected representatives expressed interest in becoming more actively engaged with the MPA. They are also interested in access to data to support decision-making on marine conservation. Also, increased education efforts for residents and tourists were highlighted as essential for successful protection. Nonetheless, representatives pointed to a lack of time and resources as major obstacles to their education efforts and involvement with the MPA's management.

6.4.4 Reflections

Co-Creation in Tool Design and Implementation

Each phase of the tool implementation was co-created by integrating academic and societal perspectives. Co-creation first emerged through collaborative problem-framing: the research questions originated from a societal need identified by the MPA's CP during the NA. This ensured that the aim, to enhance stakeholder engagement and awareness, was both scientifically and socially relevant. The choice of stakeholder groups was also shaped by societal priorities and the practical limits of the thesis timeframe.

Furthermore, co-creation emerged when building relationships, which involved developing trust and mutual understanding. Co-creation also involved co-producing a message that was relatable to all stakeholders. This required developing a shared language combining scientific and managerial perspectives. Finally, tool implementation involved collaboratively evaluating the interviews, surveys and a workshop with both academic and societal actors.

Effectivity of PEAR Tools Implementation

The three tools varied in how effectively they engaged local communities and representatives. Interviews were most successful, being well suited to the local context and providing rich qualitative insights. Their success, however, depended on fluency in French, cultural sensitivity, and time-

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

intensive preparation. In contrast, the survey had low participation, and the workshop saw no attendance.

The low workshop turnout may be related to several organisational factors. First of all, the venue had not yet been confirmed at the time the invitation was shared. The scheduled time, from 20:00 to 22:00 on a weekday in early December, may also have discouraged participation. Moreover, the invitation did not announce any interactive elements, which may have reduced the workshop's appeal. Lastly, there was no system for registration or follow up, since the invitation format did not allow for collecting contact details.

Future workshops would benefit from better logistical planning, including confirming a venue before distributing announcements and selecting a more convenient time. Furthermore, incorporating interactive elements could make the event more appealing to participants. Lastly, establishing a registration process that allows for follow up would help maintain contact with registered participants. Together, these adjustments could lead to higher attendance.

Despite the rich qualitative insights, the survey and interview samples were too small to substantially increase the awareness of the MPA. The absence of participants at the workshop further restricted awareness-raising opportunities. Similar surveys, interviews, and workshops could be implemented at the network level to improve engagement, although resource constraints currently limit this. The SEG agreed with the importance of improving communication to improve awareness and acceptance of MPAs, and recommended regular field visits, communication and dialogue as priorities. The SEG also proposed several measures: developing a sector-based newsletter to inform local stakeholders; presenting information during inter-municipal meetings to reach elected officials, and adapting interview formats to address misconceptions and clarify MPA objectives, managers and regulations.

Benefits and Challenges of the Co-Creation Approach

The co-creation approach offered several benefits. Collaboration with the CP was successful as it provided access to local knowledge on management systems and culture. Moreover, integrating diverse perspectives fostered a holistic understanding of the MPA’s challenges. However, the co-creation approach also presented challenges. Communication across languages and disciplines was

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

time-consuming and occasionally led to misunderstandings. Lastly, establishing shared ownership was difficult: inconsistent stakeholder engagement throughout tool implementation limited opportunities for co-creation because it often resulted in academic-led decision making.

6.5 PEAR Tools in the Otranto-Leuca MPA (IT)

6.5.1 Introduction

Otranto-Leuca, located in the Puglia region of Italy (Figure 10), is in the earliest stage of MPA establishment, with the precise geographical boundaries still under deliberation. In Figure 10, the areas under consideration are shown in purple. The area is currently recognized as a "marine retrieval area" and is in the process of becoming one of the largest coastal MPAs in Europe, spanning 11 municipalities. Owing to its size, the designation process has been lengthy and resource intensive.

The zonation process will depend on stakeholder uses and the area's ecological characteristics. The proposed MPA will be divided into three zones, each with distinct regulations. Zone A (the 'integral reserve') will be the most strictly protected, prohibiting all damaging activities. Zone B (the 'general reserve') will permit only low-impact activities such as SCUBA diving, while Zone C (the 'partial reserve') will allow a broader range of uses, including recreational fishing. Regulations may be adapted locally to account for specific needs.

Marine tourism plays a vital role in the local economy, with communities depending heavily on activities such as SCUBA diving, boat excursions, and recreational fishing. The sustainability of this sector relies on the health of the marine environment and the effective implementation of regulations. Equally, the long-term success of ecological measures depends on their acceptance by tourism stakeholders.

During the NA, representatives from the Otranto-Leuca MPA expressed a desire to better understand tourism stakeholders' perceptions and awareness of the proposed MPA, particularly those of local dive and boat operators. This need guided the selection and implementation of the PEAR tools within the LL. During implementation, the municipality of Otranto acted as the primary

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

representative for the proposed MPA and the other municipalities. Consequently, the implementation process focused on the Otranto municipality.

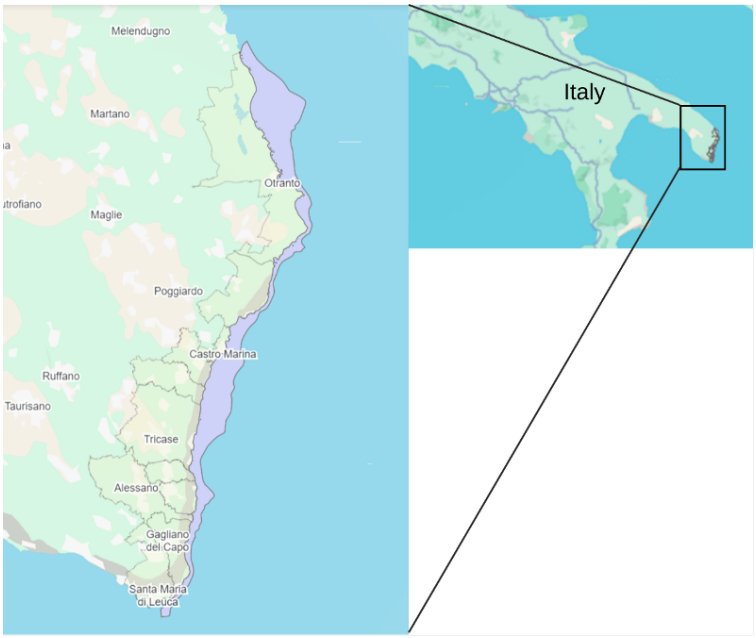


Figure 10 - Map of the Otranto-Leuca area with the 11 municipalities involved in the Otranto-Leuca MPA establishment in light yellow and in purple the area under consideration to become part of the Otranto-Leuca MPA (L. Muscogiuri, personal communication, 22 April, 2025).

6.5.2 Tool Description/Method(s)

Two key methods were used for PEAR tools implementation. Firstly, semi-structured interviews were conducted with boat and dive tour operators in Otranto. The questions were organized around Bennett's (2016) four categories of perceptions related to MPA establishment. Tour operators were selected through purposive sampling and identified with the help of a project partner based in Otranto. They were initially contacted by email, and follow-up messages were sent by text or delivered in person. Eight interviews were conducted with nine participants, two of whom were interviewed simultaneously. Each interview lasted approximately 30 minutes and was held in person in English, French, or Italian. All interviews were recorded, transcribed, and, when necessary, translated into English before being analysed using the thematic analysis method of Braun and Clarke (2006).

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

The second method was an online survey targeting tourists visiting the Otranto seascape. The questionnaire, developed in collaboration with project partners, aimed to gather baseline information on tourists' awareness and interests in MPAs and the local marine environment through a mix of closed and open questions. It was distributed via a QR code linking to a Google Form available in Italian, English, and French. Respondents were sampled through convenience sampling by approaching tourists at the beaches within the Otranto-Leuca MPA.

Data collection took place over three weeks in June and July, during the peak tourist season. A total of 50 responses were collected, including seven from the pilot testing phase. Closed questions were analysed using diagrams to visualize the data, while open questions were analysed thematically following Braun and Clarke (2006). Themes from the open questions were combined with findings from related closed questions to identify patterns. These themes helped to elicit tourists' preferences and provide insights for better integrating the tourism sector into the Otranto-Leuca MPA.

6.5.3 Main Outcomes/Results of Tool Implementation

Tourists' and Tour Operators' Awareness of the Marine Environment and Otranto-Leuca MPA

Both tourists and tour operators showed interest in marine conservation, though their level of awareness varied. Tourists generally supported marine conservation (Annex 4, Figure 23). Their understanding of MPAs was variable: most were aware that MPAs impose regulations on human activities, but they lacked knowledge of specific restrictions. Awareness of the Otranto-Leuca MPA and its protected habitats was very low (Annex 4, Figure 24), which could hinder future compliance and engagement once the MPA is established. To foster awareness, communication materials could be made accessible in multiple languages and include engaging information about local biodiversity and conservation (Tuohy et al., 2022). Moreover, regularly monitoring tourists' awareness levels could help adjust outreach strategies.

All tour operators interviewed were aware of the Otranto-Leuca MPA, though their knowledge of its boundaries and status differed. While some were well-informed, others had little understanding of the MPA. Most expressed a desire to learn more, particularly about how the MPA would affect their activities as tour operators. These differences in awareness suggest the absence of a

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

coordinated communication strategy with tour operators. Establishing two-way communication channels would enhance inclusivity in the MPA planning process.

Tourists' and Tour Operators' Perceptions of the Otranto-Leuca MPA

Most tourists described the MPA's marine environment as clean and healthy. Some, however, noted room for improvement. Despite low awareness of the MPA project itself, attitudes towards its establishment were generally positive. Tourists expected the MPA to improve marine health, improve their visitor experience, and promote sustainable tourism, which they believed would benefit both the local economy and community.

While all diving and boat tour operators were aware of the MPA project, they had diverse perceptions regarding its social and ecological impact, legitimacy of MPA governance, and the acceptance of MPA management. Dive and boat tour operators identified both social benefits and burdens associated with the establishment of the MPA. They see the MPA as a chance to protect marine life, diversify tourism, educate visitors, and deepen their connection to the sea. However, concerns include potential restrictions on fishing, boating, and diving, which could threaten livelihoods and traditions. Therefore, operators anticipate initial resistance from the local community.

With regards to ecological outcomes, some tour operators suspect a decline in biodiversity over past decades, although partially recovered after the COVID-19 pandemic, when human pressures decreased (Annex 4, Figure 25). Operators generally expect the MPA to improve biodiversity through reduced fishing, pollution, and tourism pressures, though they emphasized that it depends on effective management.

Perceptions of governance of the Otranto municipality were mixed. Some trusted the municipality and appreciated its communication efforts, while others criticized inconsistent communication and lack of legitimacy. Furthermore, interviewees stress the need for consistent updates on zoning and regulations to improve participation. Most operators expressed willingness to engage in consultations if communication improved, and meetings are held outside the tourist season.

Key themes influencing management acceptability are communication, restrictions, and enforcement (Annex 4, Figure 26). Stakeholders want clearer information on zoning and regulations

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

and regular updates. They feared that excessive restrictions could harm tourism and traditions. Proposed measures include fixed moorings, seasonal rules, and sustainable fishing permits. Effective enforcement was considered challenging due to the MPA's size and concerns about the capabilities of enforcement authorities.

Both tourists and tour operators were asked about the possible introduction of an entrance fee to the MPA. Opinions were divided: while some feared it may discourage visitors, others found it acceptable if the fees were small and used to fund conservation. Further research is needed to assess the economic implications, tourists' willingness to pay, and the most suitable implementation mechanisms.

Fishers' perspectives

Recreational fishers are an important part of Otranto's local population and tourism sector. Their main concern is possible fishing restrictions, which could affect income and traditions. Recreational fishing is viewed as part of local identity, making it a sensitive issue in MPA planning. Because fishing activities both impact and are affected by measures, including this group in the planning of the MPA is essential. Engagement would help raise interest, promote compliance, and reduce potential conflicts (Cooke et al., 2006; Lewin et al., 2019).

6.5.4 Reflections

The co-created research strongly benefited from collaboration with a local partner connected to the Otranto municipality by providing cultural insight and legitimacy within the local tour operating sector. Proficiency in French also proved beneficial, as several stakeholders were more comfortable communicating in French than in English, and it facilitated contact with French tourists, who represented a significant proportion of visitors in the Otranto-Leuca MPA. Nonetheless, language differences remained a barrier, highlighting the need for local language assistance in further research.

The researcher's natural sciences background facilitated communication with Italian collaborators who shared a similar discipline. Working closely with supervisors experienced in co-created research was indispensable in broadening the researcher's perspective and fostered ongoing reflection on

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

positionality. The experiences from this LL thus highlight the need for representation of both natural and social science backgrounds within the research team.

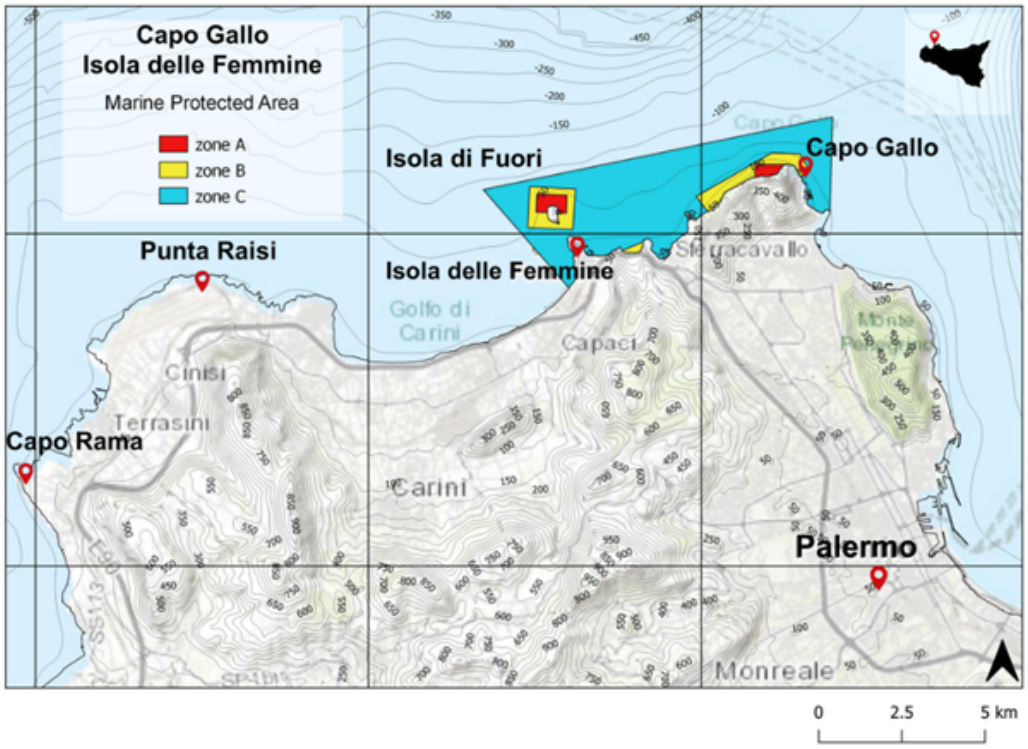
Overall, the study was regarded as a success by project partners, as it provided an initial insight into the perspectives of tour operators, forming a foundation for future research on the social impacts of establishing the Otranto-Leuca MPA. The results are expected to be shared with local tour operators during the upcoming stakeholder engagement event in late October.

6.6 PEAR Tools and Gender Equity Tool in the Capo Gallo–Isola delle Femmine MPA (IT)

6.6.1 Introduction

The Capo Gallo–Isola delle Femmine MPA, established in 2002, covers 2,173 hectares along the Gulf of Palermo and includes both the Capo Gallo headland and the small island Isola delle Femmine (

Figure 11). At the adjacent coast, approximately 8 km long, the towns Isola delle Femmine and Sferracavallo are situated. Situated within the municipality of Isola delle Femmine, the MPA was created to safeguard the local marine environment and improve ecological resources. It contains



This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

habitats of high ecological value, such as coralligenous seabeds, *Posidonia oceanica* meadows, macroalgal forests, vermetid reefs, and rhodolith beds that support local fisheries.

Figure 11 - Map of MPA Capo Gallo – Isola delle Femmine, retrieved from Randazzo et al., 2022.

Despite these ecological assets, the NA revealed that awareness of the MPA and its objectives remains low among both residents and visitors. Engagement with the public has so far occurred mainly through isolated events rather than through ongoing communication or educational initiatives. As a result, local perceptions are fragmented: fishers and pleasure-boaters often perceive the reserve as a restriction, while diving operators regard it as a tourism opportunity. Most residents and visitors, however, remain unaware of the MPA's existence or its environmental and socio-economic value. Previous outreach efforts, such as public meetings (e.g. Legambiente Naturalmente in 2016), have confirmed this knowledge gap. With tourism in the area continuing to grow, the MPA could become a driver of sustainable tourism if communication and engagement are strengthened. Improving awareness and fostering dialogue between the MPA managers, local communities, and sea users are therefore key priorities. This section examines the implementation of the PEAR tools and a Gender Equity tool as first steps toward overcoming low awareness, low engagement and little knowledge on stakeholder perceptions.

6.6.2 Tool Description/Method(s)

Two types of tools were implemented in the Isole delle Femmine MPA: the PEAR toolkit and the Gender Equity tool. The PEAR tools address the need to improve stakeholder awareness of the area so that regulations are better understood, accepted, and respected. Similar to tool implementation in the other LLs, the concept of perception is examined through four key dimensions following Bennett's (2016) framework. In line with BLUE4ALL's inclusive approach to social justice in MPA design and the EU's Pillar of Social Rights, a specified version of the PEAR tools, the Gender Equity tool, was also applied in the Isola delle Femmine MPA. Following consultations between WU researchers and representatives from the University of Palermo (UNIPA), key tourism actors, such

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

as SCUBA-diving and boat operators, were identified as primary stakeholders, alongside the SEG. Visiting tourists were classified as secondary stakeholders.

PEAR Tools: Pilot Study on Stakeholder Awareness & Perceptions

The pilot study aimed to assess public perceptions of the Capo Gallo – Isola delle Femmine MPA through a short (Italian and English) survey. The surveys were inspired by Intonti et al. (2024) and Marzo et al. (2023), and focused on awareness, perceived ecological and socio-economic benefits, participation in decision-making, and suggestions for improvement. Digital and printed flyers containing a QR code link to the survey were distributed locally and online. The materials also communicate key information about the MPA. UNIPA researchers co-designed the outreach materials with local dive operators, the Coast Guard, and a small group of residents to ensure clarity and relevance. Printed in late June (300 flyers and 5 posters), they were distributed at public places such as boat-rental stands, dive centres, Coast Guard offices and restaurants in Isola delle Femmine. Dive-centre staff noted increased visitor curiosity towards the MPA due to these promotional materials. Consequently, 15 survey responses were recorded within the first few days.

PEAR Tools: Awareness & Perceptions of Divers and Tourists

Perceptions on the functioning and effectivity of the MPA included conducting surveys, interviews, a focus group, participatory mapping and participant observation during July and August. Participants included divers who visited the MPA and owners and staff of dive businesses and boat rental companies.

Surveys based on the pilot study were conducted in person and online. Divers at a local dive centre were invited to complete a paper survey in English or Italian after their dive, which led to the completion of 72 surveys. When time allowed, the survey was conducted verbally as a short, structured interview, recorded for accuracy. Before starting, divers received a brief explanation of the MPA including a map, zoning information, and protected species. Researchers from UNIPA distributed posters with QR codes linking to the survey across restaurants and businesses in Isola delle Femmine.

Interviews were conducted with dive guides, instructors, and staff at two dive centres, as well as with owners and employees of boat rental companies. Participants were recruited through UNIPA

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

contacts, followed by on-site visits to local businesses. Interviews were conducted in English with translation support from an Italian speaking colleague. A printed list of questions in Italian was available. The interviews were recorded with consent and later transcribed and checked manually. The interview data were coded inductively and deductively. In total, interviews were conducted with 3 diving operators, 5 divers and 3 boat rental operators.

Participatory mapping was conducted during interviews and once with a group of expert divers. Participants were asked to mark the MPA boundary, places they frequently visit, marine life they had encountered, and areas they consider valuable. These maps served both as data collection tools and to explore the educational potential of mapping. Drawings were digitized manually in QGIS.

At the end of data collection, a focus group was held with staff at the dive centre to review preliminary findings. Six participants attended, representing a range of roles. The session lasted one hour and was recorded. Participants were invited to respond to statements presented in a short presentation and to explain their reasoning. Focus group data were transcribed and coded using the same procedure as the interviews.

Gender Equity Tool: Perceptions of Gender Differences in MPA Use and Management

A WU Bachelor (BSc) thesis developed a tool to elicit perceptions of gender differences in MPA use and management. Anariba et al. (2025) developed a self-assessment tool for evaluating gender equity in MPA management, following five indicators derived from Feminist Political Ecology: gender roles and power relations, gendered uses and values, gendered knowledge and priorities, gender responsive management design, and gender-inclusive management design. These indicators form the methodological basis for the tool.

The tool consists of two surveys followed by a presentation of results to the SEG. Both surveys were made available online through a QR code displayed at eight locations in Isola delle Femmine, and physical copies were distributed at sites with many tourists such as the beach, a dive shop, restaurants, and boat rental locations.

The first survey was completed by SEG members and aimed to elicit perceptions of gender equity in MPA management. It includes thirteen multiple choice questions, each with space for longer

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

responses, organized into four sections: roles, access and participation; gendered needs and knowledge; institutional commitment to equity; and a conclusion.

The second survey targeted tourists to examine perceptions of how well gender-specific needs are addressed. It includes twenty multiple choice questions, each with an option for longer responses. Although based on the same five indicators, the questions are organized into two sections for clarity: access to tourism activities and experience during tourism activities.

Semi-structured interviews were also conducted with dive operators, instructors, and boat operators. These interviews explored gendered access to livelihoods and operators' perceptions of gender differences in the MPA. Each interview followed three sections: tourists and gender, working in Isola delle Femmine, and MPA management, and lasted between five and twenty minutes.

Lastly, the researcher kept autoethnographic notes on their experiences as both tourist and researcher, to help contextualize interview and survey findings and to reflect on positionality during data collection.

6.6.3 Main Outcomes/Results of Tool Implementation

PEAR Tools: Pilot Study on Stakeholder Awareness & Perceptions

Fifteen participants completed the survey, providing some initial qualitative insights. Most respondents reported some knowledge of the MPA, with the internet, social media, and word of mouth identified as the main information sources. Overall, participants recognize the ecological and social benefits of the MPA, perceiving it as valuable for biodiversity, fisheries, and future generations. Participants were especially positive regarding the benefits for the local community and tourism.

Perceptions of the MPA's impact on the fishing sector were more divided. Although a majority viewed it as beneficial, a few respondents expressed uncertainty. Opinions on socio-economic issues such as restrictions on traditional access and community participation were also mixed, with many respondents perceiving low local involvement in governance. Several responses indicated frustration about the limited visibility of the MPA, lack of outreach, and low institutional capacity. Similarly, views on information transparency and willingness to pay for conservation measures were

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

mixed. Suggestions for improvement focused on awareness-raising among schools and citizens and better engagement of management authorities with local stakeholders.

Overall, the pilot study shows both enthusiasm and scepticism surrounding the MPA. Support for its environmental goals coexists with concerns about transparency, institutional capacity and inclusion. The small number of responses suggest that digital outreach alone is insufficient to reach diverse groups across Palermo. The sample mainly consisted of adults already familiar with marine activities or research, indicating a need for targeted engagement strategies to reach younger residents.

The pilot provided an initial picture of how the MPA is perceived. It confirms that while its ecological value is recognized, governance and communication are key challenges. Future efforts could combine digital communication with direct community interaction, ensure better demographic representation, and promote inclusive participation of social and economic sectors. This could help build trust, open up dialogue, and enhance the social legitimacy of the MPA.

The pilot study helped refine the scope of the PEAR tools implementation for the WU MSc thesis. During the pilot study, it became clear that it would also be valuable to consider stakeholders such as boat and dive operators and tourists. To provide a fuller picture and build on the pilot findings, Sija's research therefore focused on these groups.

PEAR Tools: Awareness & Perceptions of Divers and Tourists

The results show that dive and boat operators have high levels of environmental awareness. They show extensive knowledge of ecosystems, and can describe places, species, and phenomena in detail. Regarding the MPA, both diving and boating operators were aware of its existence and its boundaries and zones. In contrast, many tourists expressed appreciation for the marine environment and a willingness to behave responsibly, yet they often lacked knowledge of the MPA's purpose, zoning and regulations (Annex 4, Figure 27). The MPA's shape and location of specific zones were also perceived as unclear by tourists.

Despite this higher level of knowledge, the environmental education provided by operators appeared biased towards clients' interests. Education focused on attractive ecological features of

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

the MPA rather than on pressures within it or on why specific rules exist. As a result, visitors may gain a positive impression of the environment without an understanding of human impacts.

Perceptions of the MPA's objectives were positive across all respondent groups. Many associated the MPA with nature improvement (Annex 4, Figure 28), activity restrictions for coexistence between people and marine life, and ecological research. Operators described the MPA as beneficial for their work, because it helps safeguard local biodiversity and makes their services more attractive. Their interest in the MPA appears partly intrinsic and partly linked to the economic value that a healthy marine environment brings.

However, tourism stakeholders perceived the formal MPA objectives as too limited or ill-enforced. Operators felt that objectives were not translated into clear, visible rules. All stakeholders wish to see more enforcement and MPA maintenance (e.g. clear buoys delineating the MPA) by the coast guard. Currently, there is a sense of unfairness, particularly because not all users respect regulations.

Perceptions of management and governance revealed a need for clearer communication, better enforcement, and more proactive engagement by authorities. Participation was generally described as something that only happened when stakeholders initiated it themselves. Operators believe they already contribute to MPA goals through their own initiatives, such as retrieving ghost nets, collaborating with researchers, and organizing clean-up activities. However, dive operators also expressed an interest in becoming more formally involved (e.g. through consultation) to have their expertise recognized.

The results also point towards several opportunities for improvement. Divers, diving operators, and boating operators mentioned they feel environmental awareness should be increased through information, education, and training. The dive centre mentions they feel they have an important advisory role within education of divers. Suggestions for strengthening environmental education include training instructors and guides, developing more informative material, improving online visibility, and engaging young people. Recommendations to improve participation are consulting local stakeholders, creating advisory roles for instructors and guides, establishing technical committees, and fostering collaboration between the municipality and businesses.

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

Gender Equity Tool: Perceptions of Gender Differences in MPA Use and Management

The findings show that informal gender roles strongly shape how people experience the MPA. Gender influences access to jobs in the tourism sector, the distribution of tasks within tourism work, and the ways in which tourists engage with the area. Although respondents were aware of gender differences, some, often men, were initially reluctant to discuss them. Experiences of objectification and the sexualization of women were described by both female tourists and female tour operators. Results also revealed issues related to safety, with some female tourists reporting feeling unsafe when alone at night, and female business owners describing unsafe situations. Respondents also reported that several gender specific needs were unmet, including suitable changing spaces, secure toilet facilities, and equipment designed for women.

6.6.4 Reflections

The co-creation process in Isola delle Femmine has been constructive and produced knowledge of vital importance to MPA management. An especially fundamental insight is the need to consider the priorities of the different (tourism) stakeholders in the MPA management. Furthermore, the CP mentioned that having stakeholder perceptions reflected in quantitative and qualitative data helps give them legitimacy, which is important when translating them into recommendations for authorities or other MPAs facing similar challenges. Tangible evidence, such as survey results, can also help to stimulate goal-oriented discussions on improving MPA management.

Based on the results, the CP stresses that the next steps should focus on communication. Improving knowledge of MPA objectives is a priority and so is creating strategies that allow dialogue with all stakeholder groups in the area. Moreover, visual communication, such as an infographic, could present key information clearly and be shared through online platforms. Improving the MPA's online presence, through a more informative website and more active social media use, would make it easier for both residents and visitors to understand the aims of the MPA.

It would also be useful to repeat the surveys in other periods and to implement them in nearby areas such as Palermo, to compare perceptions and include a larger number of participants. Finally, the current transition within MPA management offers an opportunity. The findings could support

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

educating new staff on local perceptions and potential measures that could strengthen communication within the MPA.

6.7 PEAR Tools in the Katič MPA (MNE)

6.7.1 Introduction

The Katič MPA or 'Nature Park', established in 2021, is located in the coastal waters near Petrovac and includes the islands of Katič and Sveta Neđelja (PECZM, 2022). The management of protected areas in the marine zone is entrusted to the Public Enterprise for Coastal Zone Management (PECZM). One regulation is a speed limit of ten knots (18.5 km/h) for jet skis in designated areas (Zone 2), such as around Katič Island (Figure 12) (PECZM, 2022).

The NA revealed that compliance with this rule is insufficient to achieve the MPA's objectives. Therefore, the PEAR-tools were implemented to investigate the levels of awareness and perceptions of tourists, jet ski providers and other tourism stakeholders regarding the interaction between jet ski use and marine conservation in the Katič MPA. Another aim was to support mutual awareness raising, informing both tourism stakeholders about the MPA and MPA managers about stakeholders' perceptions.

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

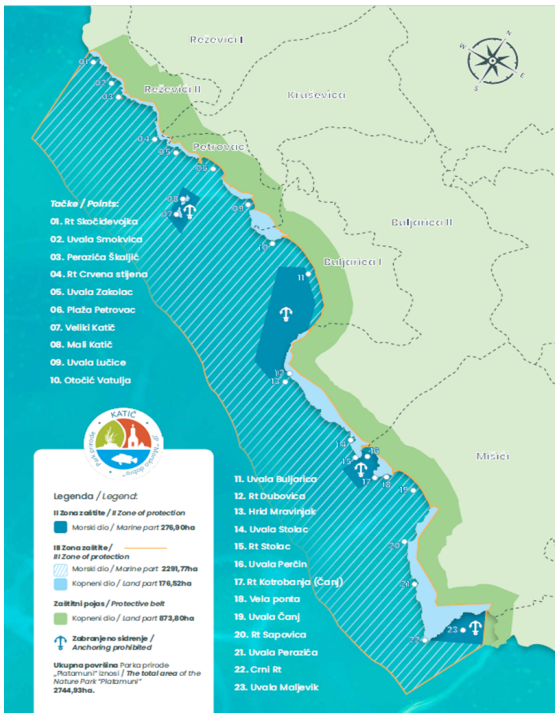


Figure 12 - Map of the Katič MPA with dark blue indicating Zone 2 where the speed limit of ten knots for boats and jet skis applies (PECZM, 2022)

6.7.2 Tool Description/Method(s)

The PEAR Tools consisted of three complementary methods: surveys, semi-structured interviews, and poster dissemination. The PEAR tools targeted several groups. Primary stakeholders were jet ski providers, (inter)national tourists and residents visiting the MPA. Jet ski providers held more knowledge on jet ski use and therefore engaged in both surveys and interviews. Tourists participated mainly through surveys. Secondary stakeholders were hotel managers and tourist information agencies. Their close interaction with tourists, local knowledge and willingness to engage made them suitable participants for surveys and interviews.

Surveys consisted of 25–30 open and closed questions in Google Forms. After piloting, surveys were conducted along the Katič MPA coastline. In total, 98 tourists participated, of which 28 reported jet ski use. Six of the estimated ten jet ski providers in the MPA also participated. Semi-structured interviews were thematically analysed and complemented the surveys. Interviewees included four hotel managers, four tourist agencies, and one jet ski provider. Lastly, awareness-raising posters in

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

English and Montenegrin, containing QR codes to access the survey, were distributed to hotels and tourist agencies in Petrovac, Lučice, and Buljarica.

After tool implementation, the Travelling Exhibition was organized on Montenegro's Day of the Coast on 25 September. The event had two main components. The first was the BLUE4ALL photo exhibition. The second was presentations and workshops to share findings from tool implementation and engage with the public. This event was a first step in moving from scientific work towards societal impact. While the organization of the event was the responsibility of the MPA managers (PECZM), its vision was co-created by the LL team. This vision emphasized that, alongside the presence of officials, public engagement was essential. The hope was to involve local stakeholders from the tourism sector, including jet ski providers.

6.7.3 Main Outcomes/Results of Tool Implementation

Awareness and Perceptions of MPAs and the Katič Nature Park

Tourists show moderate interest in the marine environment and protection, with safety, cleanliness, and accessibility ranking as higher priorities (Annex 4, Figure 29). General awareness of MPAs is moderate, with most tourists interpreting them as zones established to conserve marine life. Awareness of the Katič MPA is low, even among residents. While a majority believe the park provides ecological benefits, most lack understanding of its precise objectives and boundaries. Only a quarter of respondents were aware of protected habitats and species, and half recognized threats such as pollution, overfishing, and climate change. Despite these knowledge gaps, tourists generally support protection measures and view the MPA designation as beneficial for the area due to opportunities for preserved biodiversity, cleaner water, safety, and eco-tourism.

Jet ski providers show mixed awareness of the MPA. Some associated them with restrictions on harmful fishing practices, but most were unable to provide a definition. They generally perceive the marine environment as healthy and regard biodiversity protection as important for preserving natural beauty for future generations. Awareness of the Katič MPA, however, is low. Half knew of the Katič MPA and while they acknowledged its benefits, none could accurately describe its purpose or boundaries. Ecological awareness remains low: only two jet ski providers named species or

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

habitats in the Katič MPA. While most recognized threats like fishing and pollution, none acknowledged tourism or jet skis as pressures. Opinions on the park's protection were divided, with half expressing support and the rest uncertain about its necessity. Jet ski providers showed little interest in involvement in management, with only one provider open to consultation.

Lastly, awareness of the Katič MPA among hotel managers and tourist agencies is uneven. Long-established local actors are better informed about their designation and ecological importance, whereas newer operators have little knowledge. Across the tourism sector, communication of the park's protected status to tourists is minimal. Although some stakeholders could name species or habitats, most lacked ecological knowledge and associated the Katič MPA with its cultural heritage rather than biodiversity. Nevertheless, once informed, many recognized its value for conservation and tourism. They emphasized the importance of awareness-raising for conservation and for diversifying Petrovac's tourism offer, suggesting more dissemination of promotional materials. Several noted that linking the park to economic benefits, such as expanding the tourist offer with nature-oriented tours, would increase motivation for the tourism sector to promote it.

Awareness and Perceptions of Jet Ski Impacts and Regulations

Most tourists recognize the environmental and safety risks linked to jet ski use, such as noise, fuel pollution, and accidents. Recognition of environmental risks is lower among those who rent jet skis themselves. Knowledge of speed limits is low among both non-users and jet ski users. Non-users generally favour restrictions for safety, while jet ski users have mixed views. Some believe speed limits in Zone 2 are fair, while others fear that they reduce the appeal of the activity and are difficult to enforce. Those who had used jet skis became more supportive of speed limits once informed about the motivations behind them. However, as awareness of the Katič Nature Park is low, and jet ski providers in Petrovac do generally not inform customers about speed limits, compliance is currently low. As alternatives or additions to speed limits, jet ski users appear receptive to educational signage and clearly marked no-go zones around Katič island. However, current signage is insufficient, leaving many unaware of protected zones.

Tourists express interest in a range of activities, with swimming and boat tours more popular than jet skis (Annex 4, Figure 30). The findings from surveys and interviews suggest that jet skiing is not

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

central to the tourist experience in Petrovac and that restrictions are unlikely to affect overall tourist satisfaction.

Jet ski providers are positive towards environmental protection but do not perceive their activities as a threat, instead identifying fishing and pollution as main pressures. Awareness and acceptance of the speed limit vary. Some mention informing customers about the rules, although tourists largely report not being told. The majority state that speed limits have little to no effect on their business, as most customers ride outside the protected zones. While some providers support educational signage, there is resistance to stronger regulation or limits on user numbers.

Awareness and attitudes toward jet ski impacts differ between hotel managers and tourist agencies. Hotel managers generally understand ecological risks but are mainly concerned about guest safety, often linking accidents to weak enforcement of speed limits. Tourist agencies, by contrast, have variable perceptions. While some are very concerned about jet ski impacts, others tend to downplay concerns, especially those economically dependent on jet ski rentals.

Awareness of speed limits varied, with long-standing local hotel managers and tourist agencies more informed than newer ones. Support for speed limits is higher among hotel managers, who argue they improve safety and align with Petrovac's identity as a calm, family-oriented destination. Some tour agencies acknowledge knowing about the rules but note that compliance is weak due to low enforcement. For those reliant on jet ski income, stricter regulation is seen as a potential economic threat unless alternatives are provided.

Hotel managers in particular agree that jet skis play a minor role in Petrovac's tourism offer. Several hotel managers even view them as disruptive and argue that restrictions could improve Petrovac's reputation without harming tourism.

6.7.4 Reflections

The PEAR tools varied in their practical feasibility and how effectively they raised awareness. Overall, combining methods proved useful, as each tool had unique advantages and limitations.

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

Objectives & Expectations

The partners involved in the tool testing activities in Montenegro (PECZM, WWF Adria, WU, and Submariner) were well aligned regarding expectations like the number of conducted surveys and interviews. They also co-created and agreed on the research objectives. This alignment of expectations on objectives and outputs ensured inclusion of all partners, and it supported the researchers in planning their fieldwork, enhancing the efficiency of the research.

Surveys

In-person surveys were the most accessible and time-efficient tool. Their informal character encouraged participation, and survey conduction became an interactive awareness-raising tool. The digital format, with Google Forms and skippable open questions, helped with quick data collection. Survey conduction near tourist hotspots and the Katič information board also increased legitimacy and participation. However, some respondents found the surveys too long, so reducing the number of questions could improve participant experience. Moreover, while surveys generated a large number of responses, the depth of information was lower compared to semi-structured interviews.

Interviews

Interviews were perceived as more formal and proved difficult to conduct during the high season. Note-taking was possible, but recording was not. Despite these limitations, interviews produced more detailed insights into stakeholder perspectives than surveys and were valuable for relationship building. Implementation, however, demanded thorough preparation, cultural sensitivity, and contextual knowledge, making the involvement of a local consultant essential. The analysis also required more time, due to transcription, translation, and analysis.

Posters

Poster dissemination improved visibility and survey response rates, possibly due to a prize incentive, their attractive design and distribution in tourist hotspots. They allowed participants much time for reflection and, therefore, yielded elaborate responses. Posters also remained visible after the research period, contributing to longer-term awareness raising. They also proved useful as conversation starters during surveys and interviews. These benefits outweighed the investments in design, printing, and dissemination.

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

Travelling Exhibition

The travelling exhibition successfully reached key stakeholders, including several members of the SEG. For those unable to attend, the tool-testing results will be presented at the PECZM advisory meeting in November to gather additional feedback. Also, the event effectively invited tourists to think about the value of the marine environment, though less so on specific issues such as jet ski use. Moreover, attendees mainly included agency representatives and tourism operators, which is valuable for future collaboration, but jet ski providers were missing. Future events could be improved by opening the presentation to a wider audience, displaying posters on tool implementation outside, and engaging more directly with tourists.

Knowledge Requirements

Collaboration between a local consultant and a researcher was indispensable. Local expertise was essential for identifying and accessing stakeholders, building trust, navigating cultural sensitivities, and interpreting behaviour. The local consultant also expanded the range of stakeholders that were reached through our method: apart from tourists and jet ski providers, hotel managers and tourist agencies officers were also interviewed. Moreover, PECZM and WWF Adria provided site-specific knowledge and knowledge about the target stakeholder groups which helped optimize our approach. At the same time, the researcher's marine biology background helped respond to participants' questions, contributing to the awareness-raising objective. Together, this partnership made the research more efficient.

Recommendations for the Katič MPA

Strengthening stakeholder communication is vital to improving awareness of the Katič MPA and speed limits. Tourist agencies and hotel managers could be treated as priority actors, given their direct contact with visitors. Building trust and regular dialogue with jet ski providers is crucial, since they rarely communicate rules to tourists. Communication efforts could also target international tourists, the main users of jet skis (Annex 4, Figure 31), that tend to value environmental protection. Involving a wider range of stakeholders, including the Tourist Organization of the Budva region, local schools, fishers, and youth, can help foster community ownership.

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

Another recommendation is to increase the visibility of the MPA and speed limits. Educational signage near Katič island and distribution of materials in English would improve tourist awareness. Diversifying the tourist offer with low-impact, eco-friendly activities can also support conservation outcomes. Lastly, enforcement remains a challenge. Practical measures could include GPS-based monitoring, clear no-go zones, and speed checks on jet skis.

Based on the tool implementation results, the MPA managers prioritize several recommendations: increasing awareness and education about MPAs, zones, and permitted activities; strengthening cooperation with stakeholders, particularly in the tourism sector; organising joint meetings and educational visits; collaborating with local schools; and providing more visible information boards and promotional material.

6.8 The Facilitated Discussion Method in Dundalk Bay (IRL)

6.8.1 Introduction

In 2020, the Irish Government announced the expansion of the national coverage of protected marine areas from 2.13% of to 10% as soon as possible, and 30% by 2030 (MPA Advisory Group, 2020). The Irish government is currently working on new MPA legislation to designate more areas and strengthen management and enforcement. Several areas that may be incorporated into an MPA network are located in the Irish Sea (MPA Advisory Group, 2023), including Dundalk Bay (Figure 13).

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

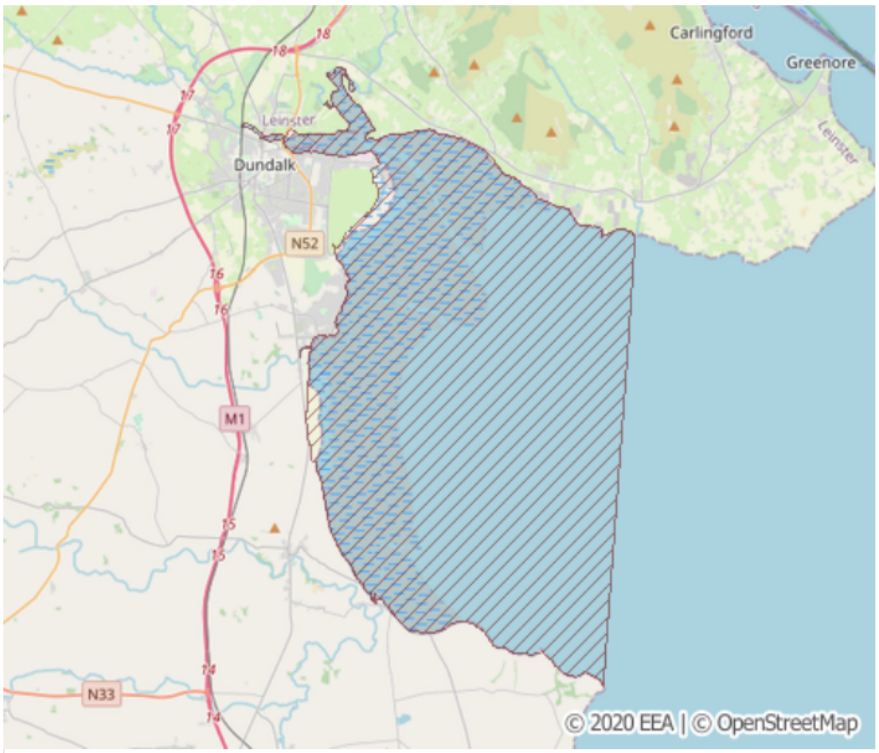


Figure 13 - Map showing Dundalk Bay Special Protection Area.

Source: European Environment Agency, 2019 (Link: https://eunis.eea.europa.eu/sites/IE0004026)

Dundalk Bay is an estuary in County Louth, Ireland. It is a Special Area of Conservation (SAC) and Special Protection Area (SPA) within the Natura 2000 sites (NPWS, 2014). Dundalk Bay is an interesting case study, as the Irish Government has made efforts to involve stakeholders in the decision-making process and align the exploitation of marine resources with conservation objectives (e.g., DHPCLG, 2021; MPA Advisory Group, 2023). The MPA designation approach thus recognizes how MPA designation, implementation, and management require the use of tools that allow for the integration of political, social, ecological, and economic considerations (Grorud-Colvert et al., 2021; Figure 3).

The focus of tool implementation in Dundalk Bay was inspired by the general results of the BA, which highlighted the need to improving stakeholder recognition, equity and participation throughout the MPA management process. The focus was on the interaction between generating *Knowledge & Understanding* (i.e., enhanced understanding of social and cultural connections of stakeholders with the protected area), and how this interacts with *Engagement & Participation* (using this enhanced

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

understanding to facilitate stakeholder interactions). The relevant processes in the sociogovernance typology that capture these interactions are *mobilisation* and *synthesis* (

Figure 3). In this case, researchers developed a conversation-based tool to raise attention of context-specific and historic links between stakeholders, by highlighting the existence of so-called path dependencies.

6.8.2 Tool Description/Methods

The tool implemented was a structured version of the facilitated discussion method. The tool was designed around the concept of path dependencies to capture the temporally dynamic link between relevant MPA stakeholders. Path dependencies describe a process of past decision making and how this created a chain of events which resulted in the present state of affairs, and which potentially constrains future decisions of different stakeholders (Hanberger, 2003; Dooms et al., 2013; Kelly et al., 2018, 2019). By making path dependencies explicit, stakeholders' understanding of their relative positions, relationships, and dynamics may be recognized and more easily discussed. Also, expectations for future MPA management may become more realistic.

This structured facilitated discussion method can be used to guide stakeholder engagement processes from an early stage in the MPA planning, implementation, management, and review cycle (see Figure 1). It achieves this by engaging different stakeholder groups and describing key moments that changed the situation for that specific stakeholder group in the past (Figure 14). These key moments could have had positive outcomes, such as enabling policy decisions or technological developments. These moments are referred to as affordances. When key moments were barriers or had negative outcomes for stakeholder groups, they are described as constraints.

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

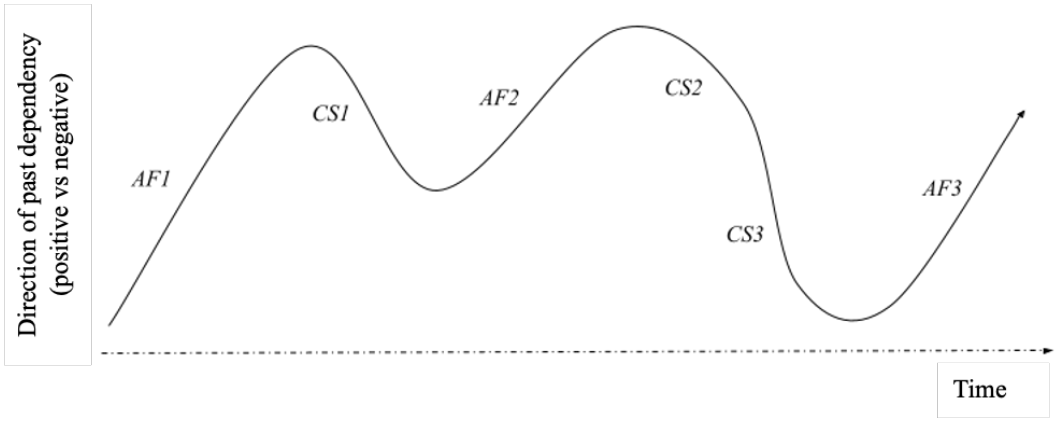


Figure 14 - Visualisation of path dependencies with Affordances (AF) and Constraints (CS) that over time influence the strength and direction of the path dependency.

In Dundalk Bay, the concept of path dependency and its contributing factors – affordances and constraints – were used throughout a stakeholder engagement process. There were two distinct phases of stakeholder engagement with specific aims, namely (1) establishing individual stakeholder groups' path dependencies and their associated social and cultural meanings and values; and (2) navigating tensions and synergies at the intersection of different stakeholder pathways.

In the first phase, researchers engaged with 25 participants across 9 different stakeholder groups (5x government/semi-state; 2x industry; 2x community). Discussion groups were organized on a stakeholder group basis (i.e., one group at a time) and ranged in size from 1 to 4 participants. Each group was asked to describe their relationship to the bay and how this had changed over time. They were also asked to indicate any decisive moments in the past (e.g., environmental or policy changes that impacted the relationship) and whether things could have developed differently. Finally, participants were asked about their experience of the current management of the bay, to reflect on whether they felt they were treated equally and if they were able to provide input to key decisions.

In the second phase, one representative from each group was invited to a mixed stakeholder meeting. There were 7 participants present from 7 different groups (4x government/semi-state; 1x industry; 2x community). Each participant was asked to recap their relationship to the bay. Subsequently, the researchers highlighted key themes from the first phase of conversations. These topics formed the basis for a facilitated discussion among stakeholder representatives on the opportunities and challenges for future collaboration in Dundalk Bay.

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

6.8.3 Main Outcomes/Results of Tool Implementation

Results from the first phase of tool implementation revealed that stakeholder relationships to the bay are both stakeholder and context specific. As expected, key social and cultural connections largely aligned with stakeholder groups' primary activities in the area. For example, a community-led environmental group emphasized the development of grassroots actions that preserve the natural environment and that help alleviate anthropogenic pressures in the area. However, there were many points of convergence between different groups, which allowed the research team to distil multiple themes for consideration in the second phase of tool implementation:

1) Unclear roles

Stakeholders highlighted the fragmentation of management responsibilities in the bay. Even among government and semi-state groups, it was not always clear who oversaw what aspect of management. This resulted in insufficient enforcement and a belief that nobody was fully in charge of the bay.

2) Lack of stakeholder engagement platform

Participants argued that there was no common engagement platform for stakeholders in the bay, making it difficult for stakeholders to contribute to decision making.

3) Balancing nature protection with economic activities

Stakeholder priorities often aligned with either nature conservation or economic activity in the bay (e.g., coastal development, shipping, fishing, offshore renewables), which were often believed to trade off. As these priorities were often based on long-standing relationships with the bay, it would be challenging for stakeholders to start interacting with the area differently.

4) Need for clear future perspective

The abovementioned themes converged in stakeholders' shared desire for a clear future perspective on the bay and its management. Primary focuses would be stakeholders' future engagements with the bay and to set out a sustainable development plan.

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

These themes were the focus of the discussion in the second phase of tool implementation. Here, participants largely agreed that there was untapped potential for stakeholder interactions. A key suggestion was that if Dundalk Bay were to become a formal MPA (pending Irish government legislation to enact such protected areas), it would be beneficial to identify either a dedicated government body to manage the bay, such as an MPA manager, or to create a robust forum for inter-stakeholder engagement.

6.8.4 Reflections

Tool implementation in the Dundalk Bay area revealed that structuring facilitated discussions on path dependencies may increase stakeholders' awareness and understanding of their own and others' positions. By explicitly visualizing and discussing how past decisions influenced the current situation, stakeholders were more likely to become aware of the political, cultural, and social context of their current position. In addition, a path dependency approach can highlight the dynamics between stakeholders by illustrating how the paths of different stakeholder groups interact with each other. For example, external policy decisions may constitute an affordance for one stakeholder group and a constraint for another. This may cause (un)conscious tension and conflict between stakeholder groups that can play a role in present MPA management. Through implementation of the tool in Dundalk Bay, stakeholders were able to identify both synergies and tensions with other stakeholder groups, while simultaneously describing shared priorities for future management of the area.

Overall, path dependency-focused tools can support MPA managers by raising stakeholders' awareness and understanding causes of conflict and tension between stakeholder groups. MPA managers can use this information to manage their MPA design, and to better maintain stakeholder relationships. Given the context-specific nature of stakeholder path dependencies in MPAs, the tool is primarily suitable for application in single geographic areas. This may include certain OECMs but generally excludes MPA networks.

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

6.9 QGIS and Participatory Mapping in the Capo Carbonara MPA (IT)

6.9.1 Introduction

The Capo Carbonara MPA was established by a Ministerial Decree in 1998, amended in 1999 and later fully replaced by the Environmental Ministerial Decree of February 7, 2012 (Official Gazette No. 113 of May 16, 2012). The MPA is managed by the Municipality of Villasimius, in south-eastern Sardinia (Italy) and covers an area of 14.360 hectares. It is divided into four protection zones with different regulations: Zone A (integral reserve: no entry, no take), Zone B (general reserve: entry, no take), Zone C (partial reserve) and Zone D (buffer zone) (Figure 15). The MPA also includes two Sites of Community Importance under the Habitats Directive 92/43/CEE, three SPA sites and has been recognized as a Specially Protected Area of Mediterranean Importance under the Barcelona Convention since 2012.

The current zonation, defined in 2012, presents several challenges. The MPA mapping conducted by Andromède Oceanology (2017), together with the monitoring activities carried out by the MPA scientific staff in the following years, revealed inaccuracies in the georeferencing of the zones and highlighted that the existing scheme does not reflect the latest biological and ecological knowledge. For this reason, an urgent need emerged during the NA to revise the zonation based on scientific evidence and environmental priorities, while also considering socio-economic dynamics and political aspects.

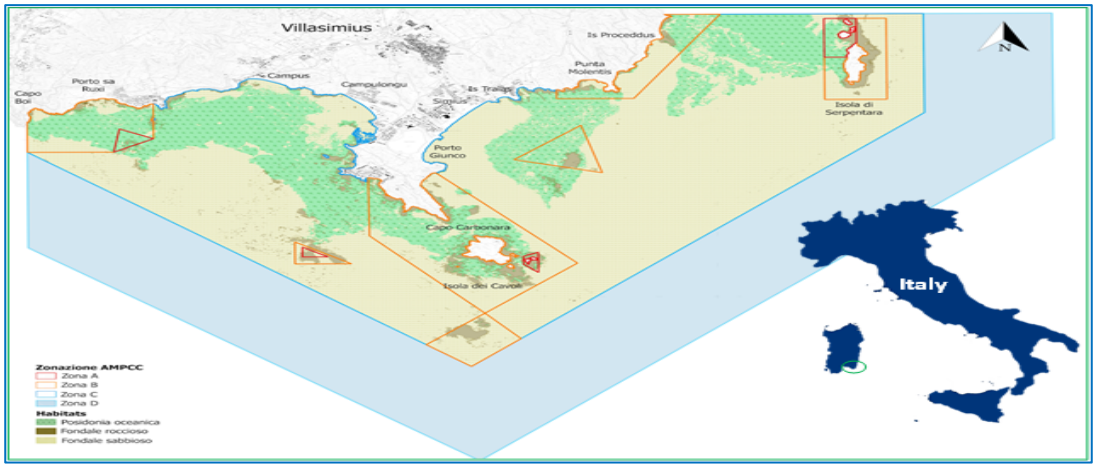


Figure 15 - Map of the Capo Carbonara MPA with its current zonation (MPACC, 2012)

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

6.9.2 Tool Description/Method(s)

A participatory mapping approach was adopted to guide the revision of the MPA's current protection levels, including the introduction of a new protection level, referred to as Bs, proposed by the Environmental Ministry. This zone corresponds to a no take area, where entry is permitted only to authorized operators (e.g. diving centres). This process was supported and facilitated by using Quantum Geographic Information System (QGIS) to integrate ecological, socio-economic, and political data into a single decision-support system.

The process began in March 2024 with the establishment of the SEG, involving both institutional and local representatives. From 2025 onwards, the SEG organized a series of workshops with external environmental experts, local stakeholders, and the municipality. The aim was to apply a participatory stakeholder approach in the revision of the protection zones, with particular attention to expanding highly protected areas. Simultaneously, the process sought to ensure that proposed changes were both environmentally effective and socially and economically acceptable. Following discussions with the experts, an initial zonation proposal was drafted based on the ecological status and habitat distribution within the MPA. This was later complemented by additional information and proposals developed with two key stakeholder groups, fishers and diving operators, to reflect their specific needs (Figure 16Figure 16).

Figure 16 - Targeted meeting with fishers representatives of the SEG.

The multiple spatial datasets collected before and during the meetings (habitat distribution, ecological monitoring results, socio-economic activities, political constraints) were managed in QGIS, and synoptic maps were generated accordingly. These maps were displayed during workshops

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

and printed (Figure 17Figure 17) to facilitate hands-on discussions about potential changes to the zonation. By overlaying the different datasets into a single map, the process produced a draft proposal that was easy for all stakeholders to visualize and interpret, while also capturing and balancing scientific evidence with stakeholder needs.

Figure 17 - Printed maps used during the meetings for new zonation discussion

The process culminated in May 2025 with a dedicated workshop where the comprehensive zonation proposal was presented to the entire SEG. Once again, large-format printed maps supported and facilitated the collective review process, enabling participants to suggest modifications using post its or verbally. The final proposal was subsequently shared with all local stakeholders of the MPA during a public workshop in June 2025.

6.9.3 Main Outcomes/Results of Tool Implementation

The structured consultation of the SEG and the external experts, supported by technical tools such as QGIS and printed maps, proved crucial in the zonation revision process. This participatory approach enabled the design of a proposal that balances the different priorities and necessities.

QGIS and printed maps supported participatory workshops by providing a clear, data-driven basis for discussion and visualization. This made it possible to integrate scientific evidence with local knowledge, offering stakeholders a tangible way to explore and compare different options.

The establishment and continuous involvement of the SEG guaranteed transparency and inclusivity throughout the process. A cooperative environment was created where the socio-economic needs

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

of different stakeholders were openly discussed, with ecological conservation maintained as the guiding principle.

The final zonation proposal (Figure 18) results from contributions by the MPA staff, the municipality, external experts, and local stakeholders, integrating ecological, social, and political considerations. The process focused primarily on adjusting the location and/or extent of the A zones (fully protected), introducing new Bs zones (no-take, entry for authorized) and modifying the boundaries of the existing B zones (entry, no-take). These changes were guided first and foremost by environmental priorities, while actively engaging stakeholders to collect feedback and explain why certain adjustments were crucial for the ecological integrity of the MPA, and would also support their activities in the long term. This dialogue helped refine the proposal, ensuring that conservation needs were met, understood, and embraced by local operators.

The new proposed zonation has been broadly accepted by all involved actors and will be submitted to the Ministry for formal approval, along with the updated regulations reflecting the new protection scheme.

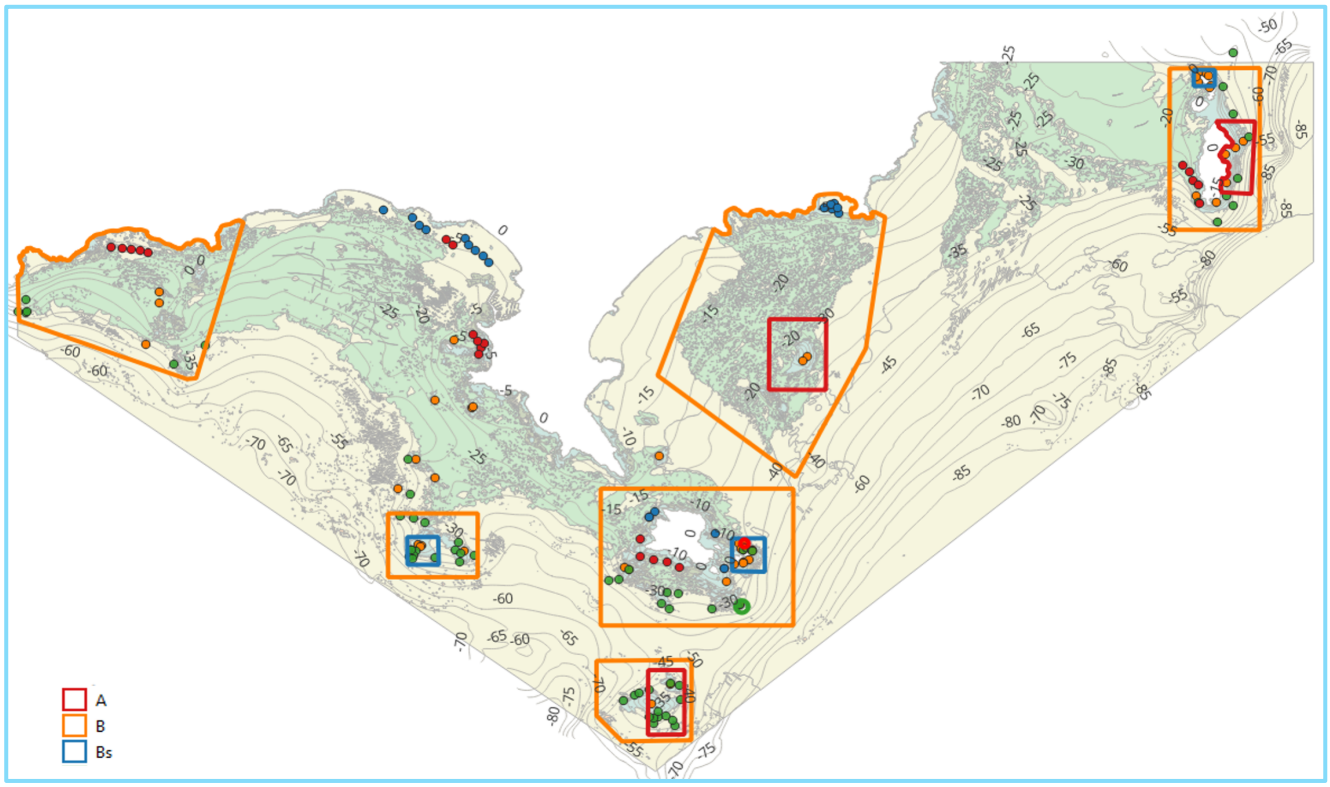


Figure 18 - Final zonation proposal. The main changes focused on the A, B and Bs zones, highlighted on the map.

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

6.9.4 Reflections

The SEG was actively involved at different stages of the process, and all meetings were held in person, which fostered more effective dialogue and participation. Dedicated meetings with specific stakeholder groups proved crucial given the lack of available data and helped design a proposal that was functional and widely acceptable for everyone.

Engagement within the SEG, however, was uneven: while some members were highly committed and contributed actively, others, despite their voluntary involvement, participated only marginally. External scientific experts, although not formally part of the SEG, played a key role by highlighting the ecological value of the MPA and supporting the case for strengthening protection measures.

The involvement of external experts was crucial in emphasizing the environmental characteristics and challenges of the MPA, helping stakeholders recognize that the need for revising the zonation arises primarily from ecological priorities, and that their activities ultimately depend on the health of the MPA's ecosystems. Furthermore, all meetings and workshops were facilitated by an external moderator, ensuring an impartial and collaborative atmosphere that encouraged open discussion and stakeholder participation.

The experience at Capo Carbonara MPA highlighted several lessons that are relevant both for this MPA and for others considering similar approaches:

- Planning and timing: stakeholder participation and technical assessments require a significant amount of time and well-structured preparation, so long-term planning in advance is essential.
- Trust and collaboration: building and maintaining a positive, transparent, and cooperative relationship between the MPA and local stakeholders is essential to ensure socially accepted and ecologically sound results.
- Accessibility of tools: providing user-friendly technical tools (e.g., QGIS outputs in simple formats, printed maps) and organizing in-person workshops proved highly effective in promoting meaningful engagement and ownership.

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

7. Conclusions

Eight LLs and one IS took part in the implementation of social and governance tools under Task 2.2. The participating LLs and IS represented all MPA phases (planning, implementation, management, and reviewing) according to the solutions framework:

- Planning phase: Dundalk Bay (IR), Finnish MPA network, Otranto-Leuca (IT): These three sites are not formally designated, with conservation planning in preparation.
- Implementation phase: Capo Gallo - Isola delle Femmine (IT), Katič (ME): On both MPAs, management has been initiated, but regulations and/or administration require enforcement.
- Management phase: Baltic MPA network, Littoral Seino-Marin (FR): The MPA (network) has authorized management, and legal structures are operational.
- Reviewing phase: Torre Guaceto (IT), Capo Carbonara (IT): Both MPAs have authorized management and operational legal structures, with new planning processes underway for expansion of the MPA.

Most of the implemented tools focused on the interactions between the MPA management and the key stakeholders of the MPA across all MPA phases. Fishers, tourists, boat and dive operators, hotel managers, government officials and residents were identified as key stakeholders across the MPAs.

The implementation of the PEAR toolkit in four LLs (Seino Littoral-Marin, Otranto-Leuca, Capo Gallo – Isola delle Femmine, Katič) proved useful for eliciting stakeholder views on the MPAs and for disseminating information. Across the four LLs, findings showed strong similarities. Awareness of MPAs, their habitats, and regulations was generally low among residents and tourism stakeholders. Many concerns about the social impacts of MPAs were linked to poor communication and little trust in enforcement, highlighting the toolkit's potential to initiate dialogue between managers and local stakeholders. Successful application of the PEAR toolkit requires not only competence in survey and interview methods and the creation of informative materials but also local knowledge to understand the specific MPA context. While the PEAR toolkit's communicative features provide a first step toward addressing the need for raising awareness, it is not possible to determine the extent to which

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

awareness was actually raised. Achieving this would require coordinated long-term awareness raising efforts and evaluation of such efforts.

Stakeholder engagement and collaboration were also highlighted as key components in the MPA planning phase. The Facilitated Discussion Method centred around bringing stakeholders together, to discuss the planned MPA and its historical legacies at Dundalk Bay; in Capo Carbonara, participatory workshops were organized to facilitate integration of stakeholders' local knowledge with scientific evidence of the area's ecological values. The use of these tools allowed for identifying synergies, building trust, and mitigating possible conflicts during the zoning and designation activities that take place in the implementation phase wherein enforcement and compliance to existing legal and policy frameworks will be launched.

Justice and equity perspectives are considered increasingly important in MPA planning, management, and governance, and they were addressed through tool implementation in three LLs (Torre Guaceto, the Finnish MPA network, the Baltic MPA network). The application of the SAGE tool in Torre Guaceto was incomplete due to challenges with access to key stakeholders especially to discuss results of the self-assessment survey. The development of the Justice Deliberation and Assessment Tool in collaboration with the Finnish MPA network planners, and its validation with the HELCOM working group, was considered a success. These experiences highlight the sensitive character of equity and justice issues and how addressing them requires capacity building, trust and open channels of communication to collaborate on local and national levels.

Implementation of the different tools/methods provides not just a list of tools and their use, but rather the conditions/contexts under which such tools may be relevant to achieve specific social and governance goal(s) or need(s) and how lessons learnt from the real case studies could feed into ongoing MPA management processes through the *MPA Solutions Hub.* The MPA Solutions Hub serves as a user-friendly platform that brings together these tools and resources to support the development of efficient and effectively managed MPAs and MPA networks. This deliverable (D2.2) provides guidelines for specific tools and methods for the MPA Solutions Hub relating to community engagement, education and awareness raising, equity and justice. Templates and instructions will be prepared for each tool to be showcased in the MPA Solutions Hub to facilitate their

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

implementation by users of the platform. These could serve as an important resource for MPAs in other social contexts. Justice and equity tools could be suitable for MPA managers/stakeholders interested in highlighting the need for a fairer and inclusive MPA management. MPA managers/stakeholders interested in enhancing stakeholder support and strengthening legitimacy and acceptability of MPA may lean more towards PEAR tools, whilst facilitated discussion methods could be more useful when the MPA seeks to enhance constructive dialogue and reflexivity among stakeholders. Notwithstanding, the utilisation of these tools should be contextualised as the processes/steps provided in the MPA Solutions Hub are context dependent and subject to change.

7.1 Tool Applicability in OECMs

An OECM is "*a geographically defined area other than a protected area, which is governed and managed in ways that achieve positive and sustained long-term outcomes for the in situ conservation of biodiversity, with associated ecosystem functions and services*" (CBD, 2018). Although the tools implemented under Task 2.2 could be modified to fit the OECM context, most OECMs currently lack the administrative structures that proved important in tool implementation (i.e., MPA management). For instance, the implementation of the SAGE tool requires an established MPA with a management plan. Hence, it will be difficult to implement in OECMs. Furthermore, PEAR tools may be relevant to elicit stakeholders perceptions about a particular OECM but may have to be calibrated to fit the local context, for example by critically reflecting on the locally relevant target audience. Furthermore, OECMs do not aim for biodiversity conservation but see benefits for biodiversity as outcomes of other, mostly resource-use oriented activities (Cook 2024). This means that implementing conservation-oriented tools in such locations would require significant adaptations to take the primary management objectives of OECMs into account.

7.2 Tool Applicability in MPA Networks

As a cooperation of individual MPAs operating synergistically at various spatial scales and with a range of protection levels, MPA networks are designed to meet objectives that a single reserve cannot achieve (WCPA/IUCN, 2007). Task 2.2 collaborated with one main MPA network (i.e., Finnish National MPA Network) and single MPAs which were part of an MPA network (i.e., Littoral Seino-

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

Marin MPA from the French Natural 2000 network - Channel North Sea and the Katič MPA in the Montenegrin network). The tools tested within these MPAs could be applied in other MPA networks, but some adaptation would be required. For example, the PEAR, gender equity and SAGE tools are perception-based and would need adjustment to the local context and specific issues or needs of each MPA in the network to support a more standardized implementation process. Similarly, implementing participatory workshops and facilitated discussion methods requires knowledge of the local context and history of engagement at each site to be able to design such workshops and discussion groups effectively and inclusively. In addition, an extra organizational layer would be necessary to coordinate the development and use of tools across multiple MPAs, to both design and apply the tools, as well as to interpret and communicate the findings. Finally, resource constraints limit the potential for scaling up tool implementation, which would need to be addressed before applying the tool at network level.

7.3 Lessons Learned and Future Tool Development

Several key lessons emerged. Overall, tool selection benefits from support by MPA managers, while transparent and consistent communication among all team members involved in tool implementation is essential. Another prerequisite for successful tool implementation is making expectations explicit for all those involved in the implementation process, and clearly defining roles and responsibilities. The involvement of a local partner who speaks the language and understands the cultural context, and who jointly implements surveys and interviews in the field, is crucial both for practical reasons and for enhancing the legitimacy of communication efforts.

Two novel tools were developed as part of BLUE4ALL's Task 2.2: the PEAR toolkit and the Justice Deliberation and Assessment Tool. In addition, to the best of our knowledge, the Gender Equity tool for MPAs developed by Anariba et al. (2025) was tested for the first time. Drawing on the outcomes of the PEAR tool implementation, the main recommendation for the LLs is the development of a communication strategy that enables sustained engagement with stakeholders. Needs for tool development are refining the conceptual framework linking awareness and perceptions and developing an approach to evaluate changes in perceptions and awareness over time. Further

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

development of the Justice Deliberation and Assessment tool should focus on tool implementation among stakeholders outside of nature conservation circles, and design of trainings for those who wish to implement the tool, but lack social scientific skills. Finally, we recommend that to further develop the Gender Equity tool, different methods are tested to establish common understanding and rapport with stakeholders, such as focus groups ensuring a safe space, given that gender can be a sensitive issue.

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

8. References

Adger, W. N., Quinn, T., Lorenzoni, I., & Murphy, C. (2016). Sharing the Pain: Perceptions of Fairness Affect Private and Public Response to Hazards. *Annals of the American Association of Geographers*, *106*(5), 1079–1096. https://doi.org/10.1080/24694452.2016.1182005

Alba, R., Klepp, S., & Bruns, A. (2020). Environmental justice and the politics of climate change adaptation – the case of Venice. *Geographica Helvetica*, *75*(4), 363–368. https://doi.org/10.5194/gh-75-363-2020

Anariba, S. E. B., Sanders, A., & Canty, S. W. (2025). Promoting gender equity in marine protected areas: A self-assessment tool. *Marine Policy, 173, 106526*. https://doi.org/10.1016/j.marpol.2024.106526

ANDROMÈDE, 2017. Inventaire et cartographie des biocénoses marines de l'Aire Marine Protégée Capo Carbonara - Sardaigne (Italie). Contrat Andromède Océanologie / Agence de l'eau RMC / Area Marina Protetta Capo Carbonara. 192p.

Arda Y., Fattebert C., Huertes Garcia M., De Raedemaecker F., Lai T.Y, Dvorski K., Scanu S., Raatikainen K.J., Barboza F.R., Perschke M.J., Van Gerven A., Rumes B., Degraer S. (2024) Integrated solutions framework. Deliverable – D1.4 under the WP1 of the BLUE4ALL project (GA n° 101094014).

Bennett, N. J. (2016). Using perceptions as evidence to improve conservation and environmental management. *Conservation biology, 30(3), 582-592.* https://doi.org/10.1111/cobi.12681

Bennett, N. J., Relano, V., Roumbedakis, K., Blythe, J., Andrachuk, M., Claudet, J., Dawson, N., Gill, D., Lazzari, N., Mahajan, S. L., Muhl, E.-K., Riechers, M., Strand, M., & Villasante, S. (2025). Ocean equity: From assessment to action to improve social equity in ocean governance. *Frontiers in Marine Science*, *12*, 1473382. https://doi.org/10.3389/fmars.2025.1473382

Bouvet, M., De Raedemaecker, F., Withouck, I., Sicard, M., Haddad, A., Adra, Y., Watt, L., Ala-Harja, V., Varjopuro, R., Frau, F., Malterre, P., Marchessaux, G., van Gerven, A., Rumes, B., Paomees, K., Saluveer, N., Dvorski, K., Čeprnja, H., Melkert, R., Carballo Cárdenas, E., Toonen, H., Crowe, T., Lecci, R. (2023). Benchmarking institutional and policy frameworks for MPAs. Deliverable - D1.1 under the WP1 of the BLUE4ALL project (GA n° 101094014).

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative research in psychology*, *3*(2), 77-101.

Brichieri-Colombi, T. A., McPherson, J. M., Sheppard, D. J., Mason, J. J., & Moehrenschlager, A. (2018). Standardizing the evaluation of community-based conservation success. *Ecological applications: a publication of the Ecological Society of America, 28 8*, 1963-1981. https://doi.org/10.1002/eap.1788

Buitendijk, T., Adjei, M., Raatikainen, K. J., Carballo Cárdenas, E. C., Varjopuro, R., & Schuitema, G. (2026). A goal-based typology of sociogovernance processes in the management of marine protected areas. *Ocean & Coastal Management*, *271*, 107948. https://doi.org/10.1016/j.ocecoaman.2025.107948

Convention on Biological Diversity (CBD) (2010). The Strategic Plan for Biodiversity 2011-2020 and the Aichi Biodiversity Targets. UNEP/CBD/COP/DEC/X/2. Available at: http://www.cbd.int/doc/decisions/cop-10/cop-10- dec-02-en.pdf

Convention on Biological Diversity (CBD). (2018). *Protected areas and other effective area-based conservation measures* (Decision 14/8). https://www.cbd.int/doc/decisions/cop-14/cop-14-dec-08-en.pdf

Chung, H.-S., & Zheng, Y.-L. (2026). Bridging the gap of localizing international MPA management effectiveness indicators and policy implications. *Ocean & Coastal Management*, *271*, 107952. https://doi.org/10.1016/j.ocecoaman.2025.107952

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

Cook, C. N. (2024). Diverse approaches to protecting biodiversity: The different conservation measures discussed as possible other effective area-based conservation measures. *Conservation Letters*, *17*(4), e13027. https://doi.org/10.1111/conl.13027

Cooke, S. J., Danylchuk, A. J., Danylchuk, S. E., Suski, C. D., & Goldberg, T. L. (2006). Is catch-and-release recreational angling compatible with no-take marine protected areas? *Ocean & Coastal Management*, *49*(5–6), 342–354. https://doi.org/10.1016/j.ocecoaman.2006.03.003

Davret, J., Trouillet, B., & Toonen, H. (2024). The digital turn of marine planning: A global analysis of ocean geoportals. *Journal of Environmental Policy & Planning*, *26*(1), 75–90. https://doi.org/10.1080/1523908X.2023.2283081

DHPCLG (2021). Project Ireland 2040 - The National Marine Planning Framework. Department of Housing, Local Government and Heritage.

Dooms, M., Verbeke, A., & Haezendonck, E. (2013). Stakeholder management and path dependence in large-scale transport infrastructure development: The port of Antwerp case (1960–2010). *Journal of Transport Geography*, *27*, 14–25. https://doi.org/10.1016/j.jtrangeo.2012.06.002

Dvorski, K., Sicard, M., Toonen, H., Raatikainen, K., Petersen, H. C., Watt, L., De Franco, F., Varjopuro, R., Barboza, F. R., Lai, T.-Y., Putnik, A., Marchessaux, G., Approved by Sicard, M., and De Raedemaecker, F. (2024). Living Lab Testing Package. Deliverable – D4.2 under WP4 of the BLUE4ALL project (GA n° 101094014). https://BLUE4ALL.eu/sites/BLUE4ALL.eu/files/managed/publications/BLUE4ALL_d4.2.pdf Echeverri, J., Cely-gómez, A., Zafra-calvo, N., González, J., Matallana-tobón, C., Santamaría, M., & Galán, S. (2021). Application of site-level assessment of governance and equity (sage) methodology to a candidate OECM: Andakí municipal natural park, CaquetÁ, Colombia. *Parks*, *27*(1). http://doi.org/10.2305/IUCN.CH.2021PARKS-27-1en

Franks, P., Booker, F. and Roe, D. (2018). *Understanding and assessing equity in protected area conservation: a matter of governance, rights, social impacts and human wellbeing*. Available at https://www.iied.org/14671iied

Franks, P. (2023). Site-level Assessment of Governance and Equity (SAGE) for protected and conserved areas: manual for SAGE facilitators. *IIED,* London. Available at https://www.iied.org/21461iied

Freeman, E. R., C. Civera, D. Cortese & S. Fiandrino (2018)**.** Strategising stakeholder empowerment for effective co-management within fishery-based commons. In: *British Food Journal*, vol. 120(11), p. 2631-2644. https://doi.org/10.1108/BFJ-01-2018-0041

Guidetti, P., S. Bussotti, F. Pizzolante & A. Ciccolella (2010). Assessing the potential of an artisanal fishing co-management in the Marine Protected Area of Torre Guaceto (southern Adriatic Sea, SE Italy). In: *Fisheries Research*, vol. 101(3), p. 180-187. https://doi.org/10.1016/j.fishres.2009.10.006.

Grorud-Colvert, K., Sullivan-Stack, J., … & Lubchenco, J. (2021). The MPA Guide: A framework to achieve global goals for the ocean. *Science, 373*(6560). https://doi.org/10.1126/science.abf0861.

Hanberger, A. (2003). Public Policy and Legitimacy: A historical policy analysis of the interplay of public policy and legitimacy. *Policy Sciences*, *36*(3–4), 257–278. https://doi.org/10.1023/B:OLIC.0000017471.88620.9a

INPN. (2024). FR2310045 - Littoral seino-marin. Intonti, G.S. et al. (2024) Public perceptions of marine protected areas: an Italian study. *Journal of coastal conservation, 28(3)*. Available at: https://doi.org/10.1007/s11852-024-01056-z.

IUCN. 2007. Establishing networks of marine protected areas: A guide for developing national and regional capacity for building MPA networks. Non-technical summary report

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

IUCN-WCPA Task Force on OECMs. (2019). *Recognising and reporting other effective area-based conservation measures*. Retrieved from Gland, Switzerland. Available at: https://portals.iucn.org/library/sites/library/files/documents/PATRS-003-En.pdf

Jentoft, S., Van Son, T. C., & Bjørkan, M. (2007). Marine Protected Areas: A Governance System Analysis. *Human Ecology*, *35*(5), 611–622. https://doi.org/10.1007/s10745-007-9125-6

Karcher, D. B., Cvitanovic, C., Van Putten, I. E., Colvin, R. M., Armitage, D., Aswani, S., Ballesteros, M., Ban, N. C., Barragán-Paladines, M. J., Bednarek, A., Bell, J. D., Brooks, C. M., Daw, T. M., De La Cruz-Modino, R., Francis, T. B., Fulton, E. A., Hobday, A. J., Holcer, D., Hudson, C., … Zhang, J. (2022). Lessons from bright-spots for advancing knowledge exchange at the interface of marine science and policy. *Journal of Environmental Management*, *314*, 114994. https://doi.org/10.1016/j.jenvman.2022.114994

Kelly, C., Ellis, G., & Flannery, W. (2018). Conceptualising change in marine governance: Learning from Transition Management. *Marine Policy*, *95*, 24–35. https://doi.org/10.1016/j.marpol.2018.06.023

Kelly, C., Ellis, G., & Flannery, W. (2019). Unravelling Persistent Problems to Transformative Marine Governance. *Frontiers in Marine Science*, *6*, 213. https://doi.org/10.3389/fmars.2019.00213

Kenter, J.O. and Martino, S. (eds), 2021. Sustainable governance of marine and coastal heritage – Methods, tools and approaches. PERICLES - European Commission, Brussels.

Kivimaa, P., Heikkinen, M., Huttunen, S., Jaakkola, J. J. K., Juhola, S., Juntunen, S., Kaljonen, M., Käyhkö, J., Leino, M., Loivaranta T., Lundberg, P., Lähteenmäki-Uutela, A., Näkkäläjärvi, K., Sivonen, M. H., Vainio, A. (2023). Evaluation of justice in climate policy. Finland climate panel report 1/2023. https://ilmastopaneeli.fi/en/hae-julkaisuja/evaluation-of-justice-in-climate-policy/

Kloppenburg, S., Gupta, A., Kruk, S. R. L., Makris, S., Bergsvik, R., Korenhof, P., Solman, H., & Toonen, H. M. (2022). Scrutinizing environmental governance in a digital age: New ways of seeing, participating, and intervening. *One Earth*, *5*(3), 232–241. https://doi.org/10.1016/j.oneear.2022.02.004

Lai T.Y, Van Schoubroeck S., Finizola e Silva M., Compernolle T., Anougmar S., Everaert G., Ala-Harja V., Dvorski K., Peronja F.H., Čeprnja H., Buljan I., Stojanovic I., Watt L., Barboza F.R., Van Gerven A., Marchessaux G., Sarà G., Statzu V., Malterre P., … Marchessaux G. (2023) Review of socio-ecological framework and methodologies. Deliverable – D1.3 under the WP1 of the BLUE4ALL project (GA n° 101094014). https://BLUE4ALL.eu/sites/BLUE4ALL.eu/files/managed/publications/BLUE4ALL_d1.3.pdf

Lewin, W., Weltersbach, M. S., Ferter, K., Hyder, K., Mugerza, E., Prellezo, R., Radford, Z., Zarauz, L., & Strehlow, H. V. (2019). Potential environmental impacts of recreational fishing on marine fish stocks and ecosystems. *Reviews in Fisheries Science & Aquaculture*, *7*(3), 287–330. https://doi.org/10.1080/23308249.2019.1586829.

Marzo, D., Cavallini, I., Scaccia, L., Guidetti, P., Di Franco, A., Calò, A., Niccolini, F. (2023) Drivers of small-scale fishers' acceptability across Mediterranean marine protected areas at different stages of establishment. Sustainability, 15(11), p. 9138. Available at: https://doi.org/10.3390/su15119138

Meehan, M. C., Singh, G. G., Ban, N. C., Devillers, R., & Claudet, J. (2023). Striking a balance between ecological, economic, governance, and social dimensions in marine protected area network evaluations. *Conservation Science and Practice*, *5*(8), e12989. https://doi.org/10.1111/csp2.12989

MPA Advisory Group (2020). Expanding Ireland's Marine Protected Area Network: A report by the MPA Advisory Group. Department of Housing, Local Government and Heritage, Ireland.

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

MPA Advisory Group (2023). Ecological sensitivity analysis of the western Irish Sea to inform future designation of Marine Protected Areas (MPAs). Department of Housing, Local Government and Heritage, Ireland.

NPWS (2014a). Site Synopsis. Site Name: Dundalk Bay SAC. Site code: 000455. Department of Arts, Heritage, and the Gaeltacht, Ireland. https://www.npws.ie/sites/default/files/protected-sites/synopsis/SY000455.pdf.

OFB. (2023). *Les oiseaux du littoral Seino-Marin* [Brochure]. Copie de Copie de Guide espèce.

OFB. (2020). Document d'objectifs Natura 2000, site Littoral Seino-Marin (FR2310045), Tome II: Etat des lieux des activités.

Pascoe, S., Brooks, K., Cannard, T., Dichmont, C. M., Jebreen, E., Schirmer, J., & Triantafillos, L. (2014). Social objectives of fisheries management: What are managers' priorities? *Ocean & Coastal Management*, *98*, 1–10. https://doi.org/10.1016/j.ocecoaman.2014.05.014

Pinto, R., & Dehmel , N. (2023). SAGE and its early contributions to improvements in governance of area-based conservation. Available at : https://www.iied.org/21316iied

Dvorski, K., Krvarić, A., Rumes, B., Putnik, A., Carballo Cardenas, E., Frau, F., di Franco, F., Mancuso, F.P., Barboza, F.R., Drews-von Ruckteschell, F., Hoppit, G., Storsjö, I., Nurkse, K., Watt, L., Muscogiuri, L., Sicard, M., Bosch Belmar, M.M., Skovgaard Jessen, M., Congiu, M., Raičević, M., Adjei, M., Perschke, M.J., Quintana, C.O., Varjopuro, R., Scanu, S., Buitendijk, T., Ala-Harja, V., Van Oijstaeijen, W., Van Schoubroeck, S. (2025). Tool validation report. Deliverable – D4.4 under the WP4 of the BLUE4ALL project (GA n° 101094014). Under revision.

Pollnac, R., Christie, P., Cinner, J. E., Dalton, T., Daw, T. M., Forrester, G. E., Graham, N. A. J., & McClanahan, T. R. (2010). Marine reserves as linked social–ecological systems. *Proceedings of the National Academy of Sciences*, *107*(43), 18262–18265. https://doi.org/10.1073/pnas.0908266107

Pomeroy, R., Parks, J., & Watson, L. (2004). *How is your MPA Doing? A Guidebook of Natural and Social Indicators for Evaluating Marine Protected Area Management Effectiveness*. IUCN, Gland, Switzerland and Cambridge, UK. xvi+216 pp. Available at: https://portals.iucn.org/library/efiles/documents/PAPS-012.pdf

Public Enterprise of Coastal Zone Management of Montenegro (PECZM). (2022). Information sheet: Platamuni, Katič andStari Ulcinj – permitted and prohibited activities in nature parks [Brochure].

Randazzo, V., Todaro, S., Provenzale, S., Di Dio, V., & Di Stefano, P. (2022). Geoconservation in Sicily (Italy): The example of the isola delle femmine (Palermo). *Geoheritage*, *14*(2), 71.

Rasheed, A. R. (2020). Marine protected areas and human well-being – A systematic review and recommendations. *Ecosystem Services, 41*. https://doi.org/10.1016/j.ecoser.2019.101048

Rocheleau, D., Thomas-Slayter, B., & Wangari, E. (2013). Gender and environment: A feminist political ecology perspective. In *Feminist political ecology* (pp. 3-23). Routledge.

Russi, D. (2020). Governance strategies for a successful marine protected area – The case of Torre Guaceto. *Marine Policy*, *115*, 103849. https://doi.org/10.1016/j.marpol.2020.103849

Scholaert F, Margaras V, Pape M et al (2020) The blue economy: overview and EU policy framework. Retrieved from: https://policycommons.net/artifacts/1337377/the-blue-economy/1945205/

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

Schreckenberg, K., Franks, P., Martin, A., & Lang, B. (2016). Unpacking equity for protected area conservation. *PARKS*, *22*(2), 11–28. https://doi.org/10.2305/IUCN.CH.2016.PARKS-22-2KS.en

Steg, L., Perlaviciute, G., & Van Der Werff, E. (2015). Understanding the human dimensions of a sustainable energy transition. *Frontiers in Psychology*, *6*. https://doi.org/10.3389/fpsyg.2015.00805

Steg, L., Perlaviciute, G., Sovacool, B. K., Bonaiuto, M., Diekmann, A., Filippini, M., Hindriks, F., Bergstad, C. J., Matthies, E., Matti, S., Mulder, M., Nilsson, A., Pahl, S., Roggenkamp, M., Schuitema, G., Stern, P. C., Tavoni, M., Thøgersen, J., & Woerdman, E. (2021). A Research Agenda to Better Understand the Human Dimensions of Energy Transitions. *Frontiers in Psychology*, *12*, 672776. https://doi.org/10.3389/fpsyg.2021.672776

Tempesta, M., Hockings, M., Stolton, S., Leverington, F., Dudley, N., & Courrau, J. (2006). Evaluating effectiveness: A framework for assessing management effectiveness of protected areas. 2nd Edition. IUCN: Gland, Switzerland and Cambridge, UK. Available at: https://portals.iucn.org/library/efiles/documents/pag-014.pdf

Tuohy, P., Cvitanovic, C., & Shellock, R. (2022). Understanding visitor awareness and knowledge of marine parks: Insights from the Ningaloo Coast, Australia. *Ocean & Coastal Management*, *227*, 106282. https://doi.org/10.1016/j.ocecoaman.2022.106282.

Varjopuro R., Raatikainen K.J., Van Schoubroeck S., Compernolle T., Van Oijstaeijen W., Mata Lara M., Stojanovic I., Toonen H. (2023) Enablers for socio-economic transition processes towards effective, efficient and resilient networks of MPAs. Deliverable – D2.1 under the WP2 of the BLUE4ALL project (GA n° 101094014).

Walton A., Gomei, M., & Di Carlo, G. (2013). Stakeholder Engagement. Participatory Approaches for the Planning and Development of Marine Protected Areas. World Wide Fund for Nature & NOAA — National Marine Sanctuary Program. 36 pages. Available at: https://awsassets.panda.org/downloads/stakeholder_engagement.pdf

WPC. 2014. The Promise of Sydney: Innovative approaches for change. Available at: https://www.worldparkscongress.org/about/promise_of_sydney_innovative_approaches.html

WCPA/IUCN. 2007. Establishing networks of marine protected areas: A guide for developing national and regional capacity for building MPA networks. Non-technical summary report.

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

9. Annexes

Annex 1 - List of MPAs and MPA networks surveyed during the Baseline Assessment

Name	Country	IS/LL	Site/Network
Parque Nacional Marinho de Fernando de Noronha	Brazil	IS	Site
Croatian Natura 2000 network for bottlenose dolphins	Croatia	IS	Network
Lastovo Islands MPA	Croatia	IS	Site
Telascica MPA	Croatia	IS	Site
Jabuka Pit FRA	Croatia, Italy	IS	Site
Gyldensteen coastal lagoon	Denmark	IS	Site
Bothnian Sea National Park	Finland	IS	Site
Baie De Seine Occidentale	France	IS	Site
Dundalk Bay	Ireland	IS	Site
Vlakte van de Raan	Netherlands	IS	Site
Marine Park of Azores	Portugal	IS	Network
Baltic sea MPA network	Baltic sea	LL	Network
SBZ 1-3	Belgium	LL	Site
Vlaamse Banken	Belgium	LL	Site
Danish Wadden Sea	Denmark	LL	Site
Väike väin MPA	Estonia	LL	Site
Väinameri MPA	Estonia	LL	Site
Finland National MPA network	Finland	LL	Network
French Natura 2000 network - Channel North Sea	France	LL	Network
Irish MPA network expansion	Ireland	LL	Network
AMP (to be established) Otranto Leuca	Italy	LL	Site
Area Naturale Marina Protetta Capo Gallo – Isola delle Femmine	Italy	LL	Site
Capo Carbonara	Italy	LL	Site
Torre Guaceto	Italy	LL	Site
Platamuni, Katič and Stari Ulcinj	Montenegro	LL	Network

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

Annex 2 – Summary of Respondents for SAGE tool assessment

Occupation of respondents	Fishers	NGOs representatives	Tourist Operators	MPA officials	Academics
Number of Respondents Survey 1	6	1	-	-	1
Number of respondents Survey 2	6	1	3	2	1

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

Annex 3 - The Justice Deliberation and Assessment Tool

The tool will be published by Finnish Environment Institute in 2026. A draft tool is available on the institute's website (the link opens a pdf file).

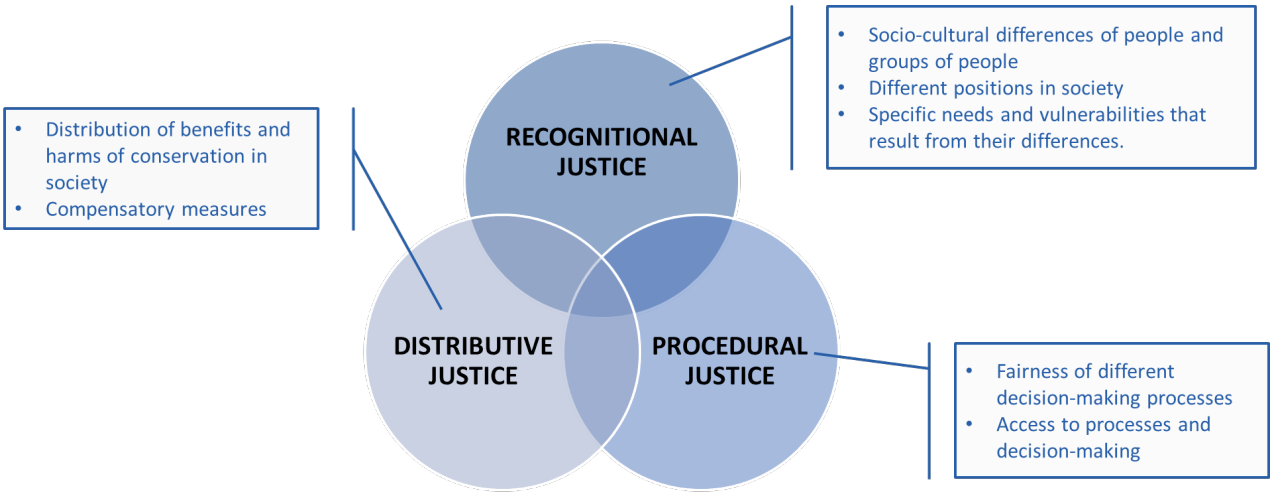


Figure 19 - The three dimensions of justice. The dimensions are interlinked and none of the dimensions alone ensures that justice is reached.

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

Annex 4 – Graphs PEAR Tools Results for Four Living Labs

4.1 Littoral Seino-Marin MPA Network

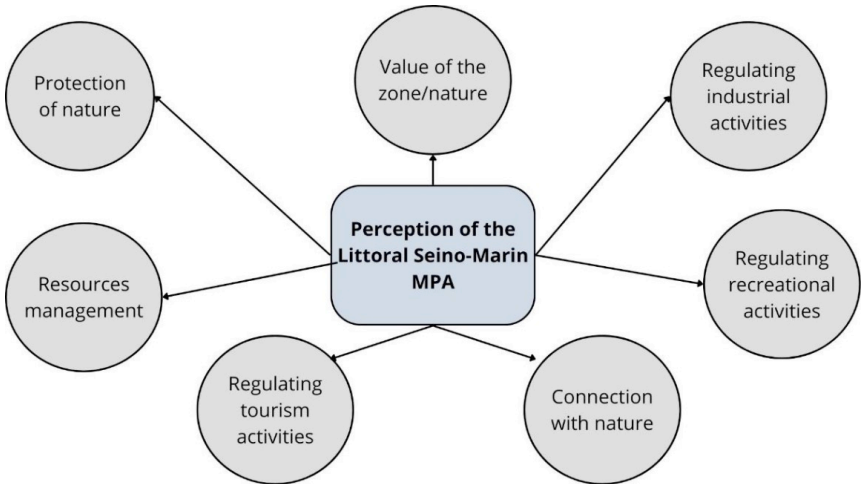


Figure 20 - Perception of the role of the Littoral Seino-Marin MPA by the elected representatives of the MPA municipalities.

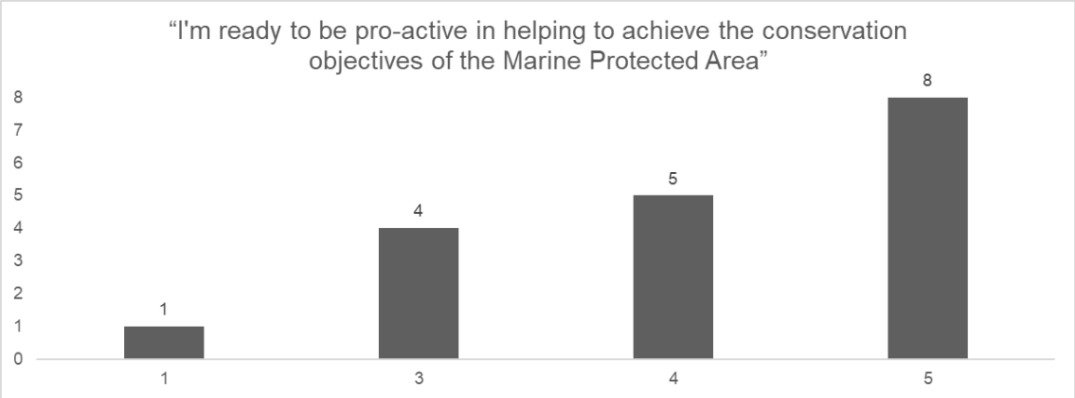


Figure 21 - Opinion on the statement "I'm ready to be pro-active in helping to achieve the conservation objectives of the Marine Protected Area". The Likert Scale was defined as: 1 means strongly disagree, and 5 strongly agree. No answer for "2", slightly disagree was recorded.

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

Figure 22 - Opinions on the statement "I'm interested in communicating with the manager of the Marine Protected Area". The Likert Scale was defined as: 1 means strongly disagree, and 5 strongly agree. No answer for "2", slightly disagree was recorded.

4.2 Otranto Leuca MPA

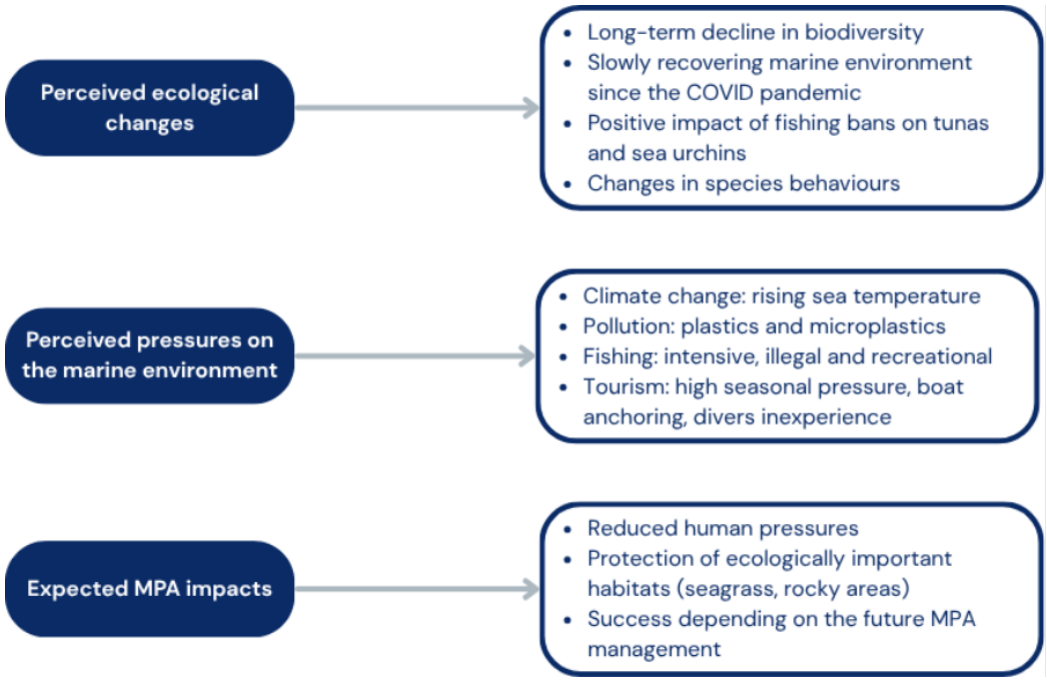


Figure 23 - Key findings concerning the interviewees' perceived ecological impacts of the future MPA on the marine environment.

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

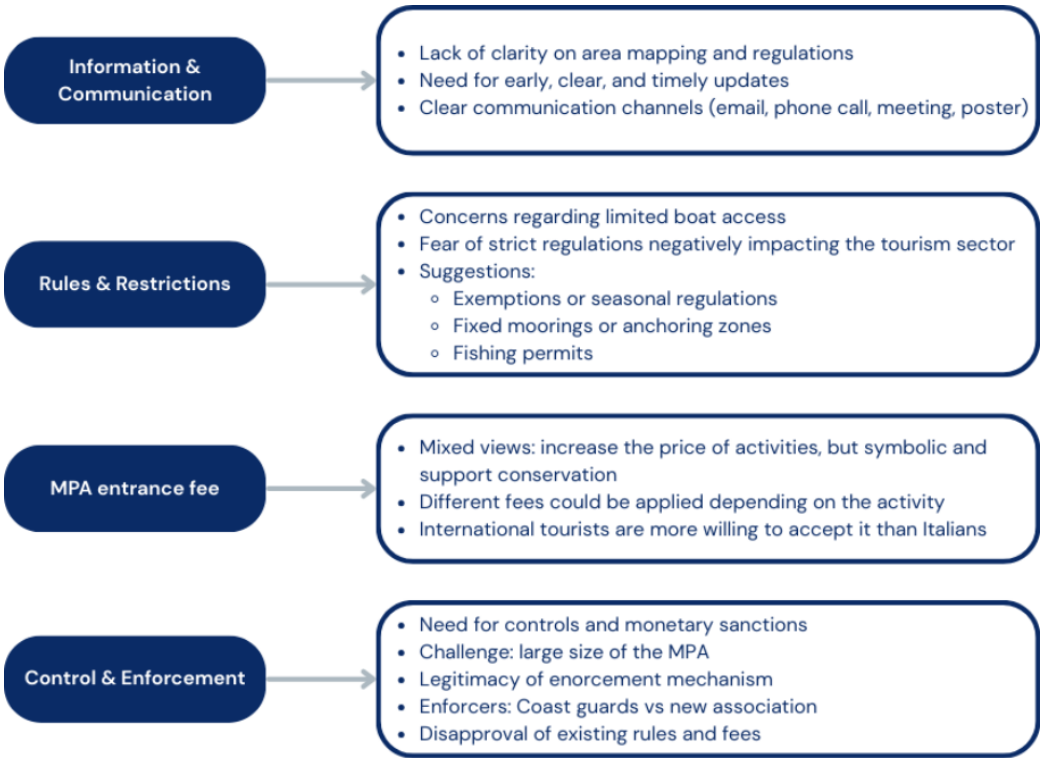


Figure 24 - Key findings of the interviewees' perceptions regarding the acceptability of the planned MPA management.

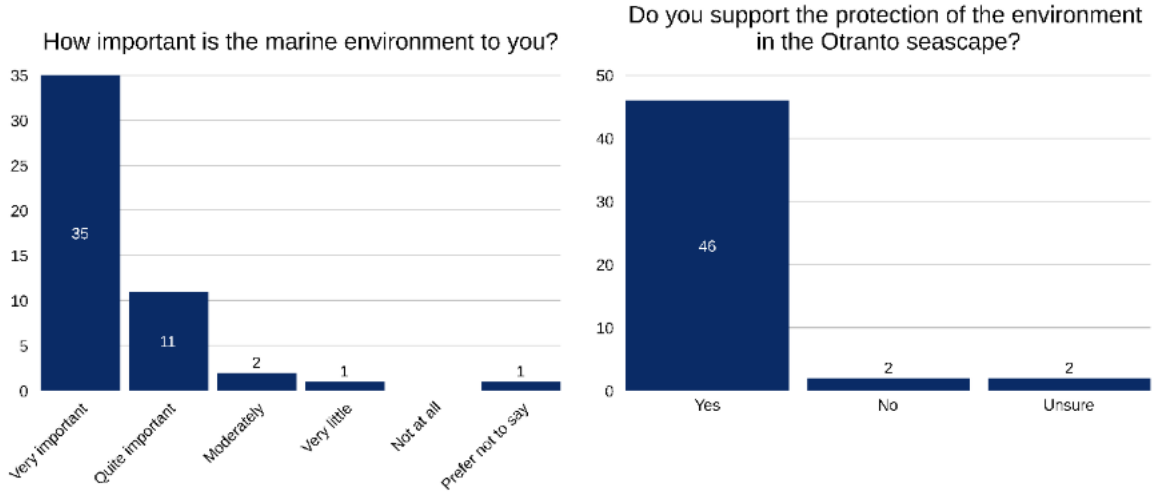


Figure 25 - Bar plots summarising the answers to two questions: "How important is the marine environment to you?" (on the left) and "Do you support the protection of the environment in the Otranto seascape?" (on the right). Concerning the graph on the left, the Likert scale was defined from Very important to Not at all. Note that no answer was recorded for the answer Not at all.

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

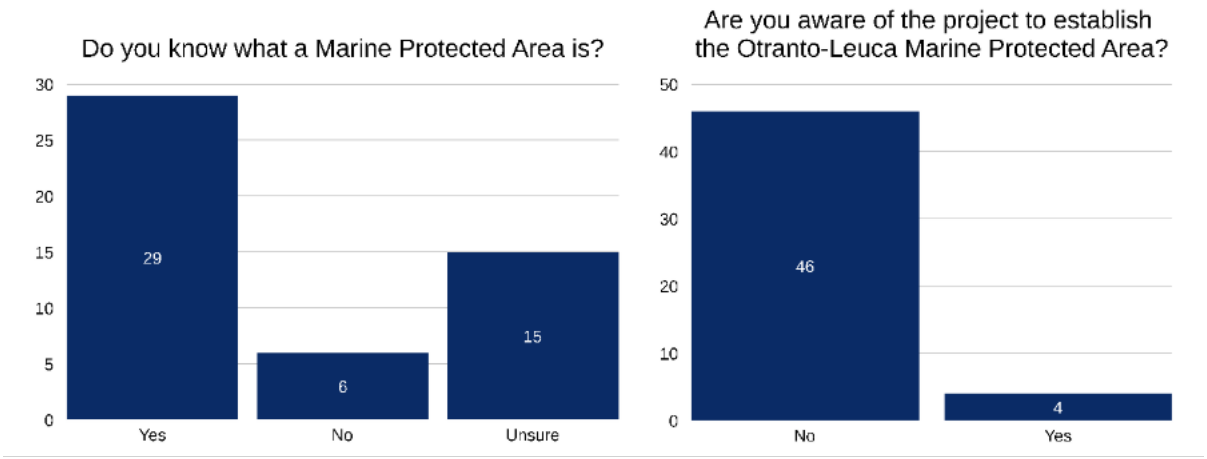


Figure 26 - Bar plots summarising the answers to two questions: "Do you know what a Marine Protected Area is?" (on the left) and "Are you aware of the project to establish the Otranto-Leuca Marine Protected Area?" (on the right).

4.3 Isola delle Femmine MPA

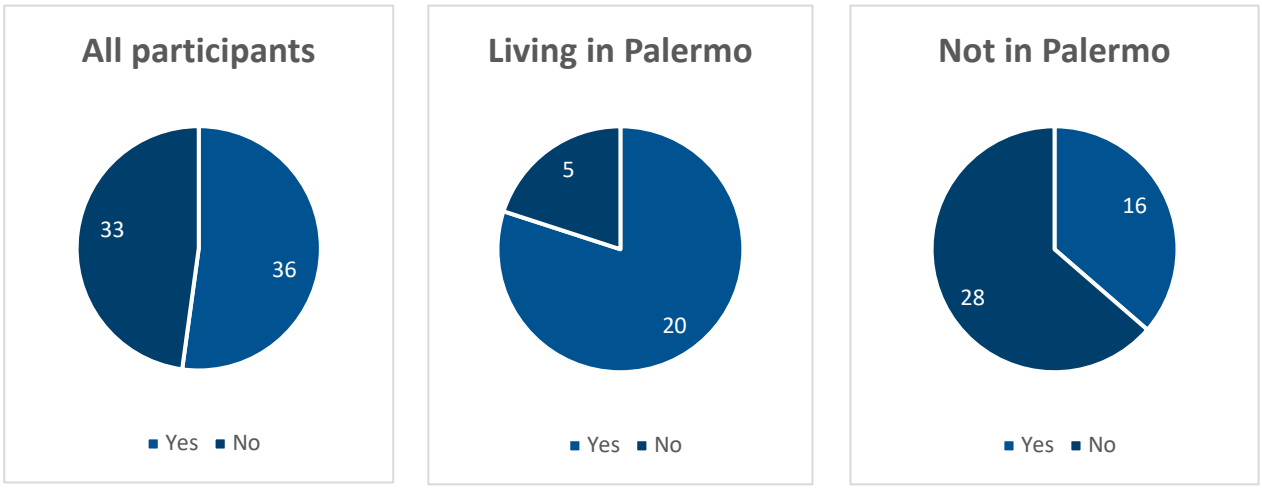


Figure 27 - Graphs showing whether respondents knew about the existence of The MPA before participation in the research.

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

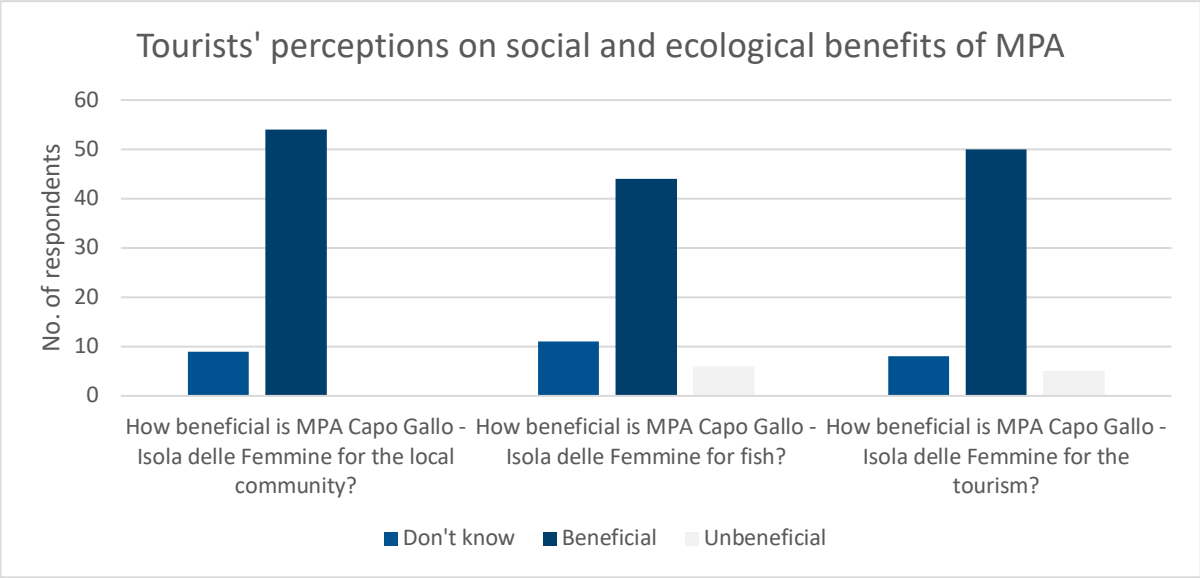


Figure 28 - Bar graph of three different statements answered by recreational divers. Y-axis shows number of respondents and x-axis the different statements.

4.4 Katič MPA

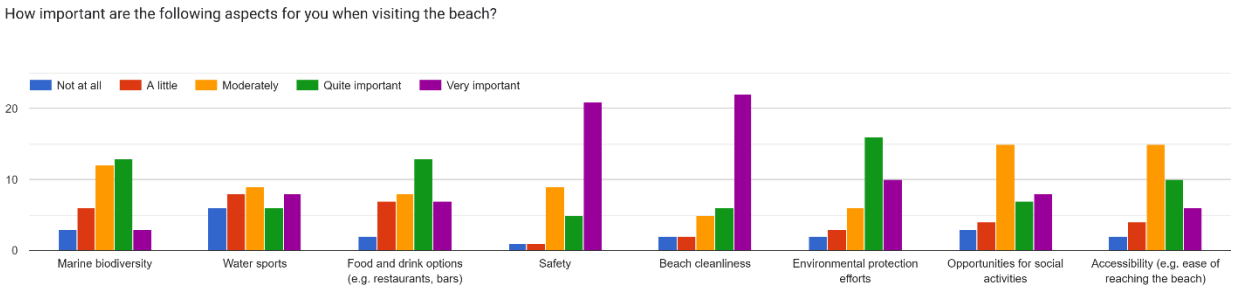


Figure 29 - Bar plots indicating the priorities of tourists when visiting the Katič MPA.

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.

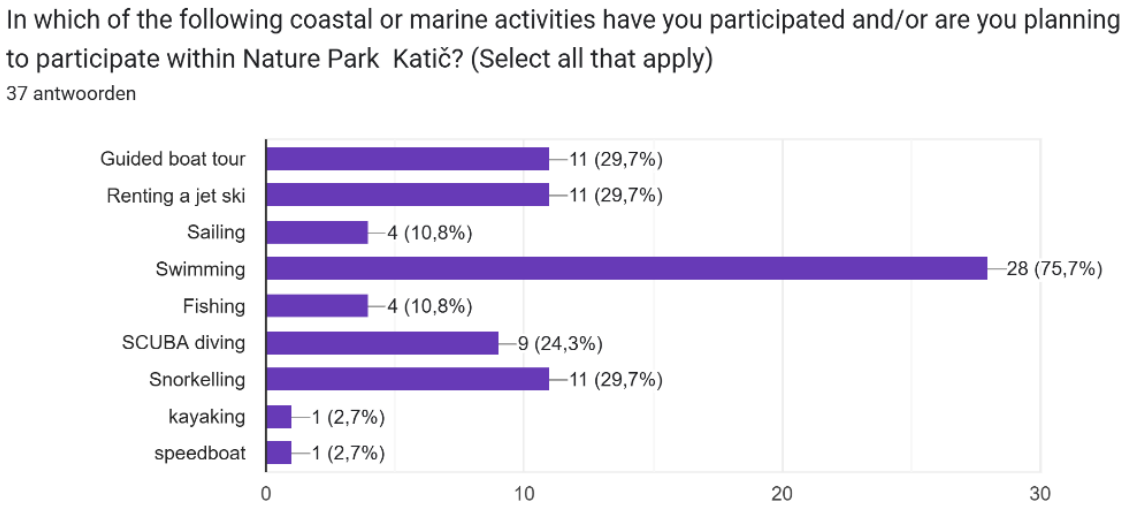


Figure 30 - Plot showing the popularity of different tourism activities in the Katič MPA.

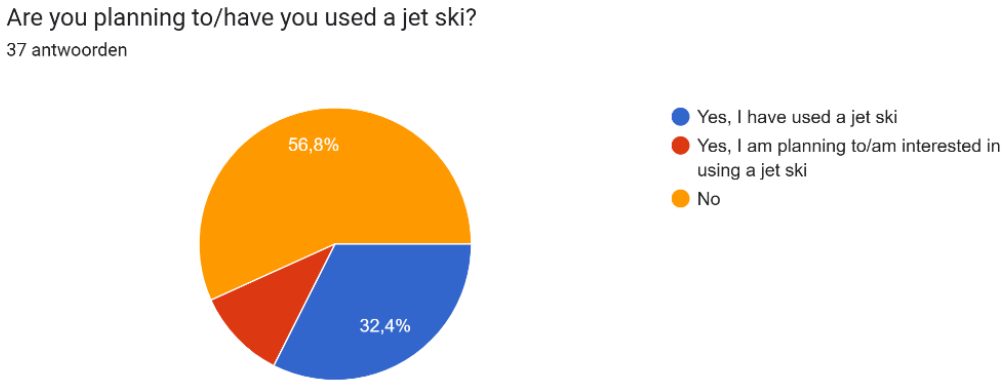


Figure 31 - Pie chart showing the popularity of jet ski use among international tourists in the Katič MPA.

This publication was funded by the European Union. Its contents are the sole responsibility of the author(s) and do not necessarily reflect the views of the European Union.