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MaCoBioS

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List of Abbreviations

EC	European Commission
EU	European Union
MSP	Maritime spatial planning
MPPs	Marine Planning Partnerships
MSs	Member States
NBS	Nature-based Solutions
NGOs	Non-governmental Organisations
OECD	Organisation for Economic Co-operation and Development
WP	Work Package

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1. Introduction

The accelerating decline and loss of biodiversity, climate change impacts, unsustainable economic and social development, increased disaster risk, and threats to food security are interconnected social and environmental challenges that compromise human health and affect people's wellbeing (IPCC, 2021, WEF, 2022, IPBES, 2019). Addressing these challenges requires improving scientific knowledge and embedding society into the deliberation and creation of science-informed solutions that incorporate societal values, facilitate uptake and increase the chance of successfully adopting new interventions. Environmental governance already integrates a range of actors, or stakeholders, as well as environmental, economic, political, and cultural considerations, in order to address environmental issues while achieving a positive societal impact. Thus, the importance of stakeholder engagement, defined here as the active involvement and participation of civil society in environmental governance, is well-recognised (Bulkeley and Mol, 2003). To be effective, environmental governance must be inclusive and consider who should be involved, why, how and when, as well as how relationships between different actor/stakeholder groups should be managed (Pomeroy and Douvere, 2008, Accountability, 2018).

The application of more inclusive approaches to decision-making has increased over the years, transforming decisions from the exclusive responsibility of public authorities to networks of state and non-state actors (Peterson, 2003). Public participation is generally seen as a way to make democratically legitimate decisions, thereby increasing "trust" in the government and support for its activities, and ultimately improving the effectiveness of those decisions (Armeni, 2016, Rowe and Frewer, 2000, OECD, 2008). It allows civil society to access information, enhance the awareness of public problems among citizens and non-state actors, influence decisions that affect people's lives and livelihoods, and benefit from decisions that better align with people's expectations.

Public participation can be defined as an organised process adopted by elected officials, government agencies or other public-sector organisations to engage citizens and other stakeholders in the formulation, adoption and implementation of public policies (Joss, 1999, Wilson, 1999). In environmental decision-making, a stakeholder can be defined as "*any group, organization or individual having a stake, interest, or who can affect a biological or physical resource, ecosystem service, institution or social system, or someone who is or may be affected by a public policy*" (Felipe-Lucia et al., 2015). Citizens and other non-state actors (such as NGOs, sectoral associations and industries) interested in or affected by a public decision constitute the "public" (Dietz and Stern, 2008). The public together with governmental organisations (such as elected representatives, national agencies and subnational governments) therefore constitute "stakeholders" to public decisions and the implementation thereof (Table 1).

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Table 1. *Citizens, public and stakeholders. Adapted from Thomas (2012).*

	Citizens	Public	Stakeholders
Non-state actors	• Citizens • Local population • Community groups • Other volunteer groups	• Citizens • Local population • Community groups • Other volunteer groups • Industry • Interest groups • NGOs	• Citizens • Local population • Community groups • Other volunteer groups • Industry • Interest groups • NGOs
State actors			• Elected representatives • National agencies • Subnational governments

1.1 Public participation in Nature-based Solutions

Recently, Nature-based Solutions (NBS) have been proposed as systemic actions that work with and enhance nature to provide environmental, social and economic benefits that simultaneously address multiple challenges (Gómez Martín et al., 2020, Cohen-Shacham et al., 2016, Seddon et al., 2020, Eggermont et al., 2015). NBS are gaining traction in high-level decision-making arenas as a response to global sustainability challenges with the aim to resolve societal problems through a focus on nature (Woroniecki et al., 2020). The European Commission (EC) defines NBS as *"solutions that are inspired and supported by nature, which are cost-effective, simultaneously provide environmental, social and economic benefits and help build resilience. Such solutions bring more, and more diverse, nature and natural features and processes into cities, landscapes and seascapes, through locally adapted, resource-efficient and systemic interventions. Nature-based Solutions must therefore benefit biodiversity and support the delivery of a range of ecosystem services"* (EC, 2020). They represent a suite of actions and tools that are at the forefront of policy dialogues about how we use and look after our environment and why, part of a shift in focus from conserving nature for nature itself to conserving nature for its value to people.

NBS are, by definition, multi-sectoral and therefore a large number of stakeholders representing different interests should be involved in the process of designing, implementing and evaluating them. A vast array of literature shows that spatial interventions that could be considered an NBS, such as MPAs, may not be successful without appropriate stakeholder engagement and involvement and that social factors are key determinants of success (Ban et al., 2017, Gill et al., 2017, Turnbull et al., 2021). Successful NBS will therefore require the coordination of communication and integrated actions across different groups of actors, including collectively addressing concerns and interests across sectors or interest groups and between governmental institutions and stakeholders at all levels.

Few examples of NBS currently exist in marine and coastal ecosystems (Chausson et al., 2020) and there is therefore limited direct experience of public participation in marine and coastal NBS design,

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implementation or evaluation to draw from. Marine and coastal ecosystems sit within dynamic and diverse societal contexts with a multitude of uses and users. For marine and coastal NBS to be successful, they must rely on social factors and reflect the diversity of stakeholders and their often-conflicting interests and activities. Achieving this requires careful deliberation and a breadth and diversity of stakeholder engagement and involvement from the stages of inception of ideas to final decision-making and subsequent implementation. Given this importance, it is critical to understand why and how policy-makers and practitioners engage with and include the public, what stakeholder groups they engage with and, in turn, what stakeholder groups want to engage in these processes, in order to identify best practices.

1.2 Objectives of this report

To inform the discussion surrounding best practices in stakeholder engagement and involvement in future marine and coastal NBS, this report reviews public participation practices in 'maritime spatial planning' (MSP) in Europe; and documents and describes the range of engagement activities undertaken within MaCoBioS, evaluating challenges experienced and lessons learned. This report aims to synthesise these experiences into key recommendations for stakeholder engagement in future state-led and research projects on NBS.

MSP was chosen as a case study for this review because: (1) there are few marine and coastal NBS currently in place to learn from; (2) it is relevant in a marine and coastal context; (3) it is in the implementation stage in many places; (4) it seeks to achieve ecological, economic and social objectives and therefore requires multi-sectoral participation similar to that which will be required for NBS; (5) responsibility for implementation is held at a national level as NBS implementation is likely to be; and (6) the EU Directive 2014/89/EU establishing the framework for MSP requires public participation. Given the longer experience of conducting stakeholder engagement in MSP, it should hold relevant lessons for implementing NBS in the future.

Stakeholder engagement lies at the core of MaCoBioS' approach and is essential to ensuring effective policy advice in line with environmental protection and social objectives. Information provision and generation of an evidence base requires integration of local social-ecological knowledge with existing scientific knowledge from relevant existing programmes and networks, and practitioner expertise and experiences. Ensuring effective and widespread use of this integrated knowledge by multiple stakeholders will ultimately be key to the successful implementation of NBS. In addition, since there is an overlap of stakeholders participating in research that underpins decision-making, and decision-making itself, it is important to consider how stakeholders are involved in research projects and government implementation processes.

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2. Review of public participation process in maritime spatial planning

Maritime spatial planning (MSP)[1] is a public process by which the relevant authorities of a country analyse, organise and allocate the spatial and temporal distribution of human activities in their sea to achieve economic, environmental and social objectives following an ecosystem-based approach (European Commission, 2022). This process results in "*an integrated multi-sectoral [marine spatial] plan that informs the current and future distribution of activities in space*" (O'Leary et al., 2021). MSP is intended as "*an approach to address conflicts of use in the marine environment and to promote environmental sustainability and blue growth*" (Morf et al., 2019: p219). In this sense, MSP is a "political process" (Jones et al., 2016), however by its nature, MSP should also be a "participatory process" with strong and meaningful engagement of stakeholders in the different stages prior to and during decision-making (Kidd and Ellis, 2012, Smith, 2018).

The European Union's MSP Directive (Directive 2014/89/EU) sets out the requirement and provides the legal basis for public participation as a binding objective and provides the legal basis. However, how participation is undertaken is left to the discretion of Member States, which opens the implementation of the MSP Directive to a range of participatory approaches (Tissiere and Trouillet, 2022). Thus, actual engagement varies across Europe. The objective of this review is to synthesise experiences reported in public participation processes in MSP to draw insights for future efforts of participation surrounding marine and coastal NBS.

2.1 Methods

2.1.1 Searches and screening

To identify potentially relevant articles, we searched Web of Science (Core Collections, University of Exeter subscription) on the 24th May 2022 using the following search string:

TS=("mari* spatial plan*" OR MSP) AND TS=((public OR citizen OR community OR stakeholder) AND (participat* OR engag* OR involv*))

Searches were restricted to scientific articles published between 2014 and 2022 after Directive 2014/89/EU was adopted by the European Parliament and the Council of the European Union. The search string was designed to capture relevant topics; however, it was not exhaustive. We recognise that evidence likely exists in other languages and within grey literature. However, the time-consuming nature of identifying, acquiring, processing and accessing this literature and available capacity limited our ability to consider these. Returned articles were downloaded into an Endnote library with duplicates removed by matching based on the title. Potentially relevant articles were screened first by title and abstract and then by full text to determine inclusion or exclusion according to the following eligibility criteria:

1. Reported or evaluated public participation in MSP implementation processes,
2. participation process contributed to state-led MSP development or evaluation,
3. study was undertaken in a European Union Member State, UK or Norway. Overseas countries and territories were excluded as EU directives do not necessarily apply to all. However, given their specific relevance to MaCoBioS, we note that no articles were identified from Martinique or Bonaire,

[1] Also known as marine spatial planning, marine planning or coastal and marine spatial planning.

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4. modelling and theoretical studies, editorials, commentaries and opinions were excluded.

Where we were unsure as to the relevance of an article, it was taken through to the next stage. Screening was undertaken by four members of a review team, with uncertainties flagged and discussed among the team. Reviewers did not screen or code any articles on which they were authors.

2.1.2 Data extraction and analysis

A pre-defined standardised data coding form (Table 2) was used to extract meta-data (information describing each study) from each article considered to be relevant at full-text review. Prior to data extraction, consistency checking was undertaken for two articles and inconsistencies were discussed and reconciled across the team. Data extraction was conducted concurrently with full-text screening.

Table 2. *Data coding framework.*

Data extracted	Potential response
Citation	Full citation of the article
Year	Year of publication
Description	Short free text summary of the article's focus and approach
Country/region	Country(ies)/region(s) in which engagement took place
Stakeholder group(s) targeted	Citizens, Local population, Community groups, Other volunteer groups, Industry, Interest groups, NGOs
Stage of engagement	Plan development, Plan implementation, Plan evaluation
Degree of engagement	Information/Consultation/Active participation
Method(s) for engagement applied	List of methods used (e.g., workshops, public events, interviews, media, printed materials, etc.)
Outcomes of participation	Free text summary of any outcomes reported from public participation
Identified benefits of participation methods	Free text summary of any benefits reported from public participation methods used
Identified challenges to participation	Free text summary of any challenges reported from public participation
Identified possible solutions	Free text summary of any solutions or recommendations reported from public participation

Findings were summarised narratively, drawing out information on participatory approaches taken by different countries with the aim of exploring: the breadth of public participation (Who was involved?); the degree of public participation (How much were they involved?); the methods of participation (How was the public participation conducted?); the purpose of public participation (Why?); the major challenges they experienced and possible solutions.

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2.2 Review findings and discussion

In total, 277 results were retrieved from searches in Web of Science. No duplicates were identified. Most (n=241) were excluded at title-abstract screening due to irrelevance based on the aforementioned criteria suggesting that public participation practices (1) are not being reported in the scientific literature or (2) were not captured by our search string. Future research should aim to investigate this. Full-text screening was carried out on 36 articles, of which eight articles were considered relevant (Table 3). These eight articles cover MSP participation processes in Scotland (United Kingdom, n=3), Germany (n=1), France (n=1), Sweden (n=1), Poland (n=1) and the wider Baltic Sea Region (n=1).

Table 3. *Relevant articles covering MSP participation practices.*

Article	Country / Region studied
Johnson, K. R., S. A. Kerr and J. C. Side (2016). "The Pentland Firth and Orkney Waters and Scotland - Planning Europe's Atlantic gateway." Marine Policy 71: 285-292.	Scotland, UK
Smith, G. and S. Jentoft (2017). "Marine spatial planning in Scotland. Levelling the playing field?" Marine Policy 84: 33-41.	Scotland, UK
Smith, G. (2018). "Good governance and the role of the public in Scotland's marine spatial planning system." Marine Policy 94: 1-9.	Scotland, UK
Aschenbrenner, M. and G. M. Winder (2019). "Planning for a sustainable marine future? Marine spatial planning in the German exclusive economic zone of the North Sea." Applied Geography 110.	Germany
Karlsson, M. (2019). "Closing marine governance gaps? Sweden's marine spatial planning, the ecosystem approach to management and stakeholders' views." Ocean & Coastal Management 179.	Sweden
Psuty, I., T. Kulikowski and L. Szymanek (2020). "Integrating small-scale fisheries into Polish maritime spatial planning." Marine Policy 120.	Poland
Zaucha, J. and A. Kreiner (2021). "Engagement of stakeholders in the marine/maritime spatial planning process." Marine Policy 132.	Baltic Sea Region
Tissiere, L. and B. Trouillet (2022). "What Participation Means in Marine Spatial Planning Systems? Lessons from the French Case." Planning Practice and Research 37(3): 355-376.	France

2.2.1 Who was engaged with and why?

Participation processes targeted a breadth of stakeholder groups (Table 1) with local communities and citizens targeted most frequently (Figure 1). However, articles reported that although professionals and regulators engaged with MSP participatory processes, little general public interest was generated (Johnson et al., 2016) or, in some cases, invited (Smith and Jentoft, 2017, Tissiere and Trouillet, 2022).

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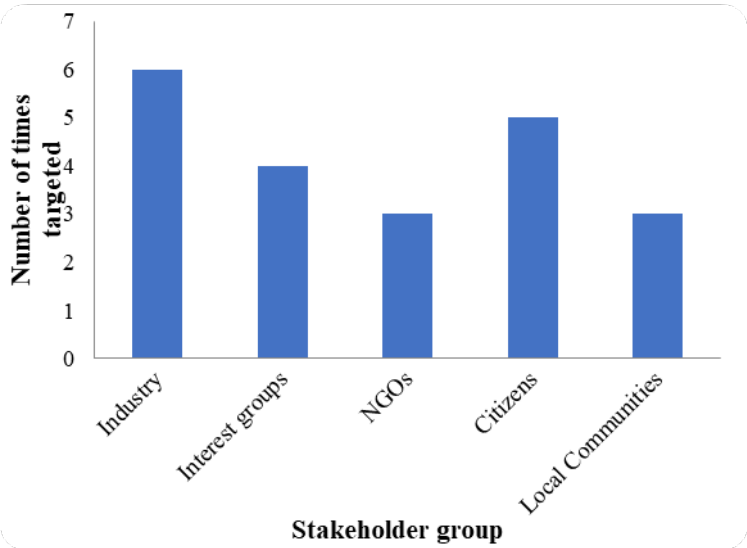

Figure 1. *Stakeholder groups targeted by MSP participation processes described by included articles(n=8).*

Various degrees of public participation are possible depending on the objectives for public participation. The OECD (2001a, 2001b) has distinguished three objectives/degrees of public participation - information, consultation and active participation - with each level building on the preceding: there can be no consultation and active participation without previously informing (OECD, 2005a).

Information about a public issue, possible policy solutions and the decision-making process consists of a one-way relationship in which communication flows from state actors to the public. Consultation brings people's perceptions and perspectives into policy-making and administrative decisions through a two-way channel of communication between government and interested stakeholder groups that invites comments, views and observations (Rowe and Frewer, 2000, André et al., 2006). Through active participation, public organisations aim to share decision-making with representatives of relevant stakeholder groups, who become a partner of the government and public agencies in the formulation and execution of public policies (Thomas, 2012). Ultimately, however, while public participation can be integrated to a greater or lesser extent in decision-making, decisions are made by an executive authority in the light of the consultation that took place.

Reported engagement activities were mostly conducted to provide information or consultation to plan development, with limited evidence of active participation (Figure 2). All stakeholder groups were targeted for both information and consultation, but only industry, interest groups and NGOs were targeted for active participation.

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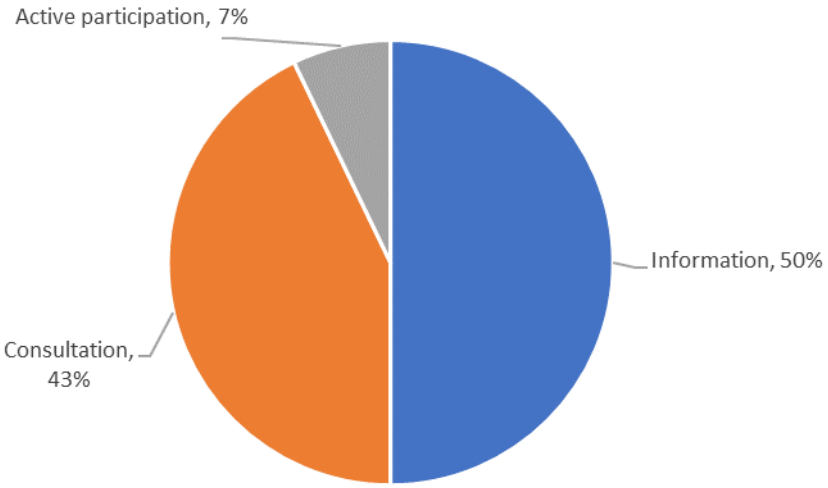

Figure 2. *Degree of engagement reported by included articles (n=8).*

2.2.2 Methods applied to engage stakeholders

Public participation during policy implementation can rely on a wide range of practices (also referred to as approaches, instruments, means, mechanisms, methods, procedures, processes, techniques, tools, etc.) to inform, consult and actively engage the public (Balla, 2005). Although there are a large variety of practices for informing, consulting and engaging the public, distinctions between these are not always straightforward and no single method is better than others. Table 4 presents a list of example practices that may be used to pursue a specific degree of public participation compiled from the scientific literature (e.g., Creighton, 2005, Thomas, 2012), policy reports (e.g., OECD, 2015) and professional associations (such as the International Association for Public Participation[2]).

Table 4. *Examples of public participation practices. Based on Creighton (2005), Thomas (2012), OECD (2015), and the International Association for Public Participation[2].*

Information	Consultation	Active participation
• Printed information; • Internet; • Media relations; • Public events.	• Citizen surveys and opinion polls; • Public meetings and workshops; • Public consultations; • Public hearings.	• Working groups; • Advisory bodies; • National commissions.

The reviewed articles reported a wide range of practices for public participation in MSP (Figure 3). The most commonly applied practices were formal (statutory) consultations (e.g., asking for written

[2] The International Association for Public Participation (IAP2) is the principal professional association in the field of public participation (Thomas 2012). Its toolbox arranges instruments of public involvement into three categories: sharing information; compiling and providing feedback; and bringing people together (see http://www.iap2.org; last access: 06.07.2022).

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comments on a consultation draft) and participatory mapping (e.g., asking stakeholders to draw on a map where activities took place) (both reported in four articles). Public events (e.g., drop-in sessions) and workshops (e.g., with different stakeholder groups) were also frequently reported (both reported in three articles).

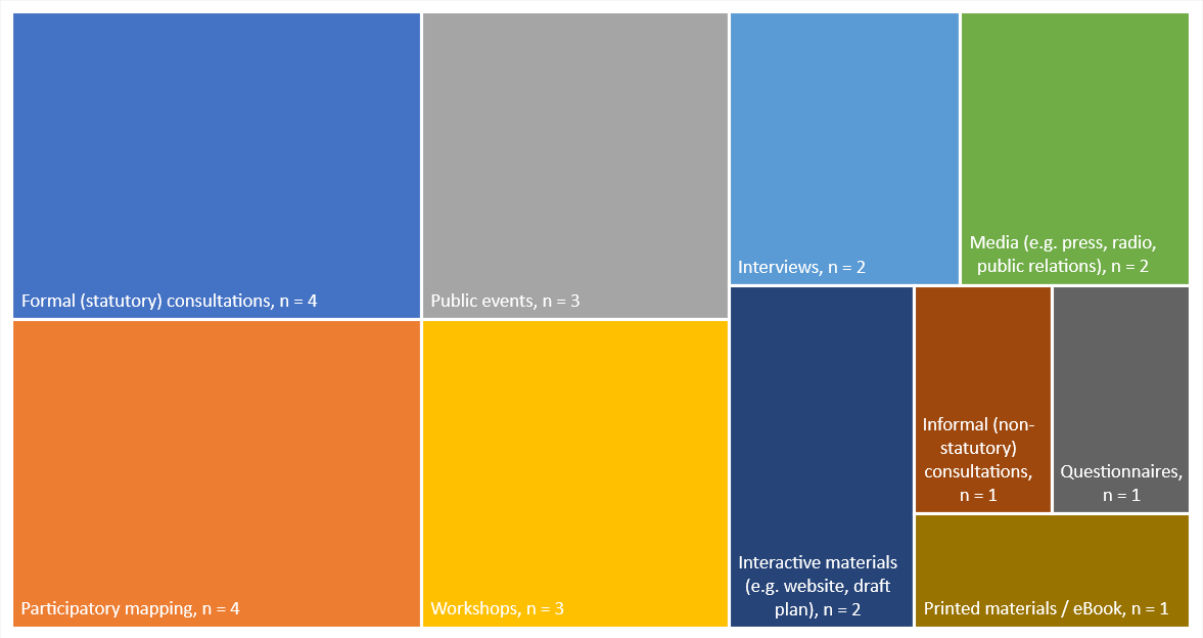

Figure 3. *Participatory methods reported by included articles (n=8).*

2.2.3 Added value and major challenges identified for public participation in MSP

The reviewed articles report a number of reasons why public participation adds value to MSP decision-making. First, the public can bring information, expertise and ideas into decision-making (Dietz and Stern, 2008), which can complement scientific insights and, in the case of MSP, lead to a better understanding of the marine environment and the social dimension that it entails (Tissiere and Trouillet, 2022, Zaucha and Kreiner, 2021). Second, public participation is expected to increase the legitimacy of public decisions because they become the result of stakeholders' voices, thereby resulting in more trust for governments and their administrations (e.g., Tissiere and Trouillet, 2022). This may lead to broader ownership of decision-making, reduced transaction costs (i.e., costs of agreeing on practical solutions to address trade-offs), and positive effects on ideological attitudes and perceptions of stakeholders that, in turn, influence their interpretation of the outcomes (Johnson et al., 2016, Zaucha and Kreiner, 2021, Smith and Jentoft, 2017). Third, public participation can strengthen the democratic nature of decision-making by enabling all parties (e.g., citizens, industries, interest groups, NGOs and local communities) to express their opinions and values during decision-making and see them included in the resulting decisions (Smith and Jentoft, 2017: p34).

Public participation can, however, also lead to unintended consequences for the policy process and the public decisions it is expected to improve. In particular, three key challenges have been identified elsewhere: the weakening of decisions' content, lower managerial performance and matters of representation (Bingham et al., 2005, West, 2005). We found evidence of these challenges in the reviewed literature:

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- Public participation can weaken the content of public decisions when initial objectives are watered down with the purpose of reaching a consensus among actors with very different interests and values (Rowe and Frewer, 2000). Indeed, there is evidence that stronger actors steer decisions towards their interests, thereby weakening decisions and outcomes for other stakeholders in MSP processes (Aschenbrenner and Winder, 2019, Johnson et al., 2016).
- Public participation can affect the managerial performance of the decision-making process with the high costs of time and resources (financial and human) of planners, public authorities and interested participants it usually implies. The inclusion of multiple actors tends to slow down decision-making and may have important financial repercussions (Smith and Jentoft, 2017), meaning limited (if not scarce) time and resources act as restricting factors on participatory processes (Zaucha and Kreiner, 2021, Tissiere and Trouillet, 2022).
- The inclusion of all relevant stakeholders always poses several problems in public participation, starting from the definition of who is a "relevant" stakeholder and according to whom (Smith and Jentoft, 2017). Stronger organised and professional interest groups (namely industry and lobbyism) are more likely to take part in participatory processes, while the non-organised interest groups (i.e., individual citizens from civil society) who participate are usually better educated and tend to have higher than average incomes (Smith and Jentoft, 2017, Johnson et al., 2016). Failure to target a broad range of stakeholders is, however, likely to lead to greater prioritisation of objectives (e.g., economic) that are not always in line with the priorities of local communities, and MSP will be effective only if it is perceived to be an inclusive and just process (Smith and Jentoft, 2017). Challenges to engage marginalised stakeholders include a lack of awareness that they will be affected by MSP, resulting in limited interest (Zaucha and Kreiner, 2021), stakeholder fatigue (Johnson et al., 2016, Smith and Jentoft, 2017), and logistical and financial challenges (Psuty et al., 2020).

2.3 Conclusions and key findings to enhance public participation in MSP

The adoption of the MSP Directive and its obligations for national implementation has made the EU one of the most advanced regions in developing MSP at the international level (European Commission, 2022). This review found that MSP largely operates as a top-down exercise with central governments acting as the main decision-makers, concurring with previous works (e.g., Morf et al., 2019, Tissiere and Trouillet, 2022). In some cases, decision-making powers have been delegated to the regional level, however, we found no examples in this review of MSP in Europe being "co-constructed" and only limited levels of active participation by a diverse range of stakeholder groups. Instead, our review highlighted that consultation seems to be the preferred form of participation across those countries (Figure 2). Overall, some gaps exist between designing and implementing participatory processes, likely due to capacity and resource availability. Institutional systems and practices for MSP are evolving rapidly and they clearly need to develop more participatory designs, which has been identified as constituting one of the major challenges in MSP (Frazão Santos et al., 2019). Based on this review, we highlight five key findings to aid this process.

1. **Early involvement is key.**

Public participation should start early in the process of MSP with all relevant stakeholders involved at the earliest stage possible that is appropriate to them (Smith, 2018). The timing of involvement is

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key, with longer participatory processes requiring a greater commitment from stakeholders to continue participation (Smith and Jentoft, 2017). Stronger incentives for public participation need to be developed to overcome the stakeholder fatigue reported in some experiences (e.g., Johnson et al., 2016). Greater public involvement early on would quite likely slow the process down but would yield a broader debate and more widely accepted outcomes, thus potentially saving time and effort at a later stage (Smith and Jentoft, 2017).

2. **Appropriate levels of engagement depend on objectives.**

The level of public participation required, or achievable, from different stakeholder groups in MSP will likely vary depending on the objective of engagement. The objective, potential challenges and positive outcomes expected from participatory practices should be designed consciously with representatives from different stakeholder groups, considering the specific institutional, political, social, cultural and historical context of decision-making (Beierle and Cayford, 2002). Ultimately, forms of public participation practices (e.g., information, education, consultation, involvement, partnership, sharing of decision-making) should not be treated as hierarchical options. They can and should complement each other with an overarching goal on the agenda: MSP should work to address existing power relations between stakeholders to avoid entrenching or exacerbating certain power-relationships and hierarchies (Smith and Jentoft, 2017).

3. **Both formal and informal arrangements are useful.**

Informal processes of cooperation, such as the exchange of information and experience through, for example, open days or ad hoc conversations, should be launched simultaneously or even before formal stakeholder engagement takes place (Zaucha and Kreiner, 2021). Limiting public participation to the formal MSP process can restrict access to new stakeholders and may create the impression that such engagement is required only as a formality, making its practical meaning and significance seem dubious to some stakeholders (Zaucha and Kreiner, 2021). Formal top-down driven processes, therefore, need to engage with bottom-up processes and give room to informal approaches (Morf et al., 2019), which can facilitate bottom-up actions and awareness raising. While communities cannot take full responsibility for marine spatial planning, they are likely to appreciate access to an open, informal mechanism for generating public debate and it may help bring in new stakeholders to the process.

4. **Integrating collaboration and cooperation in engagement is important.**

Effective engagement of different sectors (e.g., fishers, diver tourism) can only happen if a long-term cooperative relationship is built, which may require facilitating public participation in the entire process of data collection, verification, conclusion and presentation (Psuty et al., 2020). A public participation (or stakeholder engagement) strategy specifying who, how, where and when will be engaged should be developed and shared with stakeholders (Zaucha and Kreiner, 2021). The building of trust is considered a key factor for the success of MSP (Zaucha and Kreiner, 2021). Recent guidelines for public participation (e.g., IOC-UNESCO, 2009, 2021) may be useful for informing the design of a stakeholder engagement strategy.

5. **Stakeholders' capacity can be strengthened through effective communication.**

For the public to participate in MSP as fully and meaningfully as possible, stakeholders must be empowered with adequate capacity (Smith and Jentoft, 2017) and participation practices made accessible (Zaucha and Kreiner, 2021). To facilitate this, information should be communicated simply, 'jargon-free', with clear language, and in a range of formats. Glossaries of terms made easily available and spread before public events, meetings and consultations may help to provide all stakeholders with a common understanding (Zaucha and Kreiner, 2021). A variety of communication and consultation formats and tools, online and offline, are also likely to help target different

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stakeholder groups, inspiring discussions and generating interest (e.g. the Scottish Marine Atlas, Smith and Jentoft, 2017; public presentations, radio and TV interviews). Ensuring stakeholders have the capacity to use and engage with different formats and tools is critical to facilitating their uptake (Zaucha and Kreiner, 2021). Undertaking early engagement may help enhance stakeholder capacity through education on MSP concepts and their role in the process (particularly for disadvantaged stakeholders), with opportunities provided by longer involvement increasing understanding, definition of relevant interests, and formation of various partnerships (Zaucha and Kreiner, 2021).

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3. Reflections from stakeholder engagement in MaCoBioS

MaCoBioS aims to help decision-makers and practitioners communicate about Nature-based Solutions (NBS) to mitigate and adapt to climate change and in order to make more effective and appropriate decisions in the future management of marine and coastal ecosystems for the benefit of society. The overall objectives of stakeholder engagement within MaCoBioS are to:

1. inform, and learn from, diverse stakeholder groups,
2. identify and respond to stakeholder needs,
3. improve robustness of analyses, project direction and findings,
4. ensure relevance and social acceptability of results and policy advice,
5. enhance legitimacy of the results and project programme, and
6. improve uptake of MaCoBioS outputs.

Here, we reflect on the stakeholder engagement activities conducted within MaCoBioS at the time of submitting this deliverable (November 2022) that may be useful to future efforts around NBS evidence generation, communication, and implementation.

3.1 Stakeholder engagement approach taken by MaCoBioS

There are different levels of stakeholder engagement, from sharing information (communication) through to active participation in research and decision-making (OECD, 2005b) and, more recently, knowledge co-creation (Bammer, 2019). The appropriateness of the level of engagement to strive for depends on the objective of engagement activities. There is also a wide range of tools and methods for facilitating stakeholder engagement across these different levels. MaCoBioS aims to provide information on the project's scientific outputs, communicate about NBS, and integrate stakeholders through a process of knowledge exchange to inform potential tools, guidelines and solutions. The project's approach to stakeholder engagement is shown in Figure 4.

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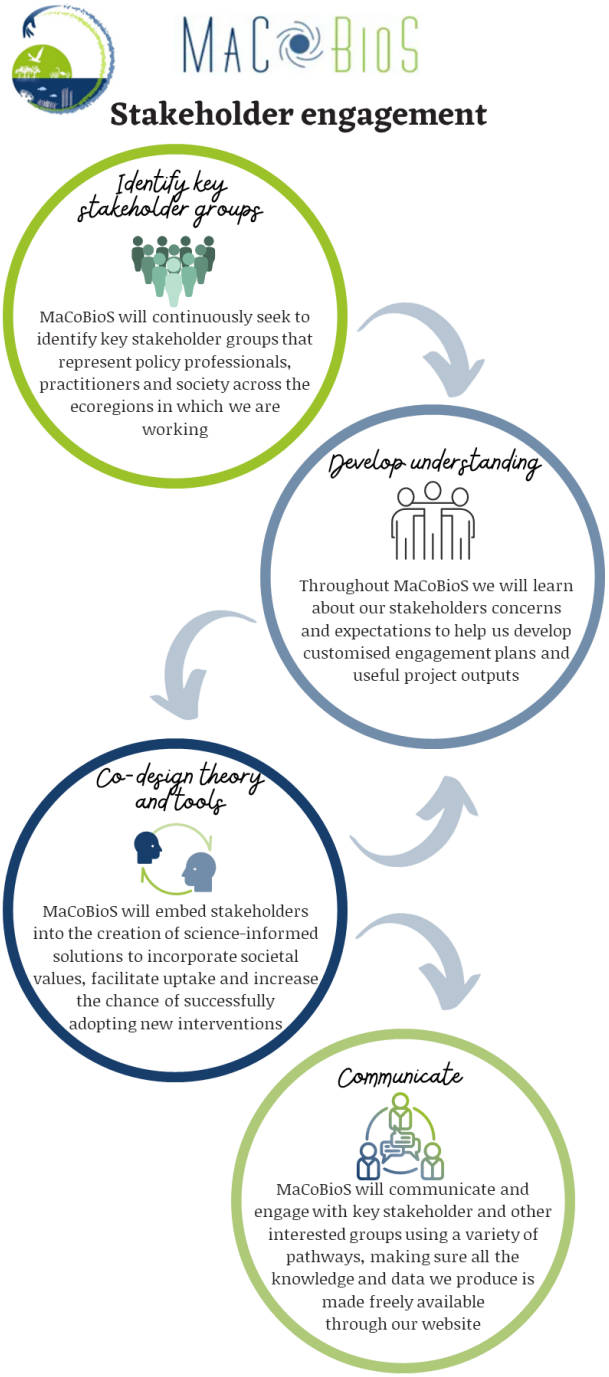

Figure 4. *MaCoBioS's approach to stakeholder engagement.*

MaCoBioS began in June 2020 in the midst of the coronavirus pandemic. Turning the world upside down, the pandemic shifted the MaCoBioS team to online working and had implications for fieldwork and stakeholder engagement plans. MaCoBioS, therefore, had to adapt to the new reality of online-based activities and communication. Communication surrounding topics of relevance to MaCoBioS and our stakeholders (led by Work Package [WP] 5) and some engagement activities (coordinated by WP4 but led by all WPs) were therefore integrated into the MaCoBioS website or conducted online. Nonetheless, to build lasting relationships with stakeholders and ensure their engagement within specific areas of the MaCoBioS project, informal and face-to-face activities were organised as far as possible within respective WPs and Tasks. To minimise risk from coronavirus restrictions,

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engagement activities focused on small groups or individual interactions to identify and address specific needs. Whenever possible, MaCoBioS was also represented at external events (for instance, academic conferences) to disseminate and increase awareness of the project's findings (coordinated through WP5).

3.1.1 Engagement channels

The process of external engagement within MaCoBioS began with the identification of stakeholder groups relevant at international and national levels for NBS implementation (WP4 [Task 4.1]). A stakeholder engagement plan was then developed through Task 4.2 to outline the process for the exchange of knowledge between stakeholder groups and MaCoBioS partners at different stages of the project. This plan acted as an internal living document for the project partners to design and coordinate activities across work packages, seek synergies where possible, document activities, and ensure appropriate contact with stakeholders. A communication plan was developed alongside through WP5 (Task 5.3) to allow MaCoBioS to communicate with and reach different stakeholders. Twitter and Instagram accounts were opened at the beginning of the project and are actively used by MaCoBioS researchers to share relevant research findings and discuss broader policy and societal issues related to marine and coastal ecosystems and the impacts of changing climate on these. In addition, a variety of engagement channels were used to try to involve and communicate with stakeholders meaningfully. This section summarises these, including reflections on their benefits and possible limitations (Table 5).

Table 5. *Benefits and possible limitations of engagement channels used within MaCoBioS.*

Channel	Benefits	Possible limitations
Online engagement and communication (multi-level stakeholder platform, social media)	- Generally low-cost and effective way to communicate project information and outputs to a broad audience from across the project.	- Generally provides one-way information on the project (knowledge transfer) rather than knowledge exchange. - Difficult to get buy-in for general public discussions hosted online. - Members-only forums (e.g., with log-in) increases the difficulty of access and hinders buy-in. - Tailored online forums can be expensive to design and manage. - Requires technical expertise.

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Channel	Benefits	Possible limitations
Workshops	- Provides an occasion to present information to stakeholders allowing them to provide views and opinions, thereby creating opportunities for in-depth learning and knowledge exchange. - Promotes a sense of inclusion and involvement and increases the chance of data and knowledge provision from stakeholders to be integrated into outputs. - Provides the opportunity for stakeholders to influence research and creates a sense of ownership. - Improves trust, respect, and collaborative partnerships. - Shares knowledge and experiences across stakeholders from different countries and institutions.	- Selective number of participants. - Expensive. - High logistical requirements, including travel restrictions. - Language of workshop can limit participation, particularly from policy-makers or practitioner groups. - Participants might be reluctant to voice their opinions face-to-face and alongside unknown individuals. - Low uptake and attendance by stakeholders overburdened by requests to take part in workshops and other forms of engagement (stakeholders' fatigue). - Limited attendance due to daily work demands (e.g., loss of workdays, for example fishers) or busy agendas, for example in government employees.
Interviews and focus groups	- Facilitates in-depth knowledge exchange between MaCoBioS partners and key stakeholder groups, informing targeted baseline information and feeding directly into theory and tool development. - Builds partnerships. - Develops personal collaborative networks across research and practitioner circles. - Facilitates tailored actions.	- Selective number of participants. - Participants might be reluctant to voice their opinions face-to-face.

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Channel	Benefits	Possible limitations
Informal discussions	- Allows for more in-depth and freely spoken stakeholder engagement, bringing local knowledge, experience, skills, and data to assist in developing and operationalising tools and outputs to ensure utility. - Increases understanding of policy and practitioner evidence needs. - Builds partnerships. - Develops personal collaborative networks across research and practitioner circles. - Facilitates development of new contacts.	- Does not develop larger collaborative networks across research and practitioner circles.
Online survey	- Targets a large audience enabling opinions and views from many individual stakeholders. - Opinions expressed can be more honest when protected by anonymity.	- Difficult to achieve high response rates. - Difficult to reach some stakeholder groups. - Potential for misinterpretation of questions.
Events	- Broad exposure maximising outreach potential and increasing dissemination of outputs across multiple stakeholder groups. - Opportunity to expand interested stakeholders database and seek feedback on project outputs.	- Generally provides one-way information on the project (knowledge transfer) rather than knowledge exchange. - Topics covered in these events may not be comprehensive and integrated. - Tend to be focused on specific stakeholder groups.

3.1.1.1 Online engagement and communication

A multi-level stakeholder platform (led by WP4 [Task 4.2] with support from WP5 [Task 5.3]), branded as 'News and Views' and hosted on the MaCoBioS website (https://macobios.eu/news-and-views), has been used to help effectively communicate information of interest to our stakeholders, opportunities for engaging with us, and our findings. Through this, we aimed to provide common outputs from across the project and targeted themed topics of content to coincide with particular days of international interest, e.g., World Wetlands Day or World Oceans Day. While originally a discussion forum was envisaged to be contained within the multi-level stakeholder platform, the project ultimately decided not to proceed with this following informal discussions with project partners and stakeholders as to its added value relative to its cost. Concerns were raised about the

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uptake of both a public or members-only forum, particularly from decision-makers acting in their official roles, moderation of content, and the need for technical assistance to set up the discussions and maintain the tool. Instead, discussions were targeted directly with stakeholders to maximise input and to facilitate in-depth conversations and insight. The 'News and Views' pages were supplemented through social media activities on Twitter and Instagram.

3.1.1.2 Workshops

MaCoBioS intends to conduct in-person stakeholder workshops to support WP2 (Task 2.1), WP3 (Tasks 3.2 and 3.3), WP4 (Tasks 4.2 and 4.3) and WP5 (Task 5.1). Each workshop will be tailored to the specific ecoregion in which they are to be held and their overall goal. At least one workshop will be held in each ecoregion. Workshops with policy makers and practitioners are intended to explore topics such as NBS concept and definitions, how to identify spatial opportunities for marine and coastal NBS, whether the ideas of risk assessment and suitability mapping can help progress NBS, collect feedback on the tools developed by MaCoBioS, and discuss evidence needs. At the time of submitting this deliverable, the first workshop representing the Western Mediterranean ecoregion, hosted in Lecce, Italy, has been completed. Workshops are also being planned in Paris, the Caribbean and the UK in early 2023.

3.1.1.3 Interviews and focus groups

Semi-structured interviews and focus groups have been used by WP2 to co-design the multi-dimensional resilience index (Task 2.2). A series of three or four focus groups will be held in Italy as part of the Mediterranean ecoregion. These focus groups aim to facilitate local engagement activities and application of the multi-risk assessment framework (WP2 [Task 2.1]), scenario analyses (WP2 [Task 2.3]) and suitability mapping (WP3 [Task 3.3]). These focus groups will be centred around a local marine protected area and climate adaptation planning and will facilitate in-depth knowledge exchange between MaCoBioS partners and key stakeholder groups, feeding into theory and tool development. At the time of submitting this deliverable, the first focus group, hosted in Lecce, Italy, has been completed.

3.1.1.4 Informal discussions

Informal discussions with external stakeholders were held throughout MaCoBioS by all WPs. The aim of these conversations was to identify new potential contacts, develop relationships, access and verify data, test principles, and gain informal insight into project development through open discussions. A direct approach was taken towards arranging informal discussions, which were held in a place, at a time and in a language convenient for the stakeholder.

3.1.1.5 Online surveys

To obtain a broader overview of stakeholder concerns, perceptions and awareness of climate change effects and NBS a three-month online survey was conducted by WPs 3 (Task 3.2) and 4 (Task 4.2) and, with the support of MaCoBioS partners from across all WPs, made available in four languages: English, French, Italian and Spanish. The survey was publicised through the social media accounts (Twitter, Instagram) of MaCoBioS. Representatives of key stakeholder groups in the countries and territories MaCoBioS works, identified through WP4 (Task 4.1), were contacted directly to inform them of the survey. In addition, members of the MaCoBioS consortium advertised the survey through their own networks and by including the web link of the survey in their email signatures. A separate online survey was conducted to explore how NBS practitioners engage with other stakeholders (e.g., fishers, tourists, local communities) to inform future communication pathways.

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3.1.1.6 Events

MaCoBioS has been represented at external events by project partners to disseminate and increase awareness of the project's findings (coordinated through WP5). These events have been used to maximise outreach, expand our stakeholder database, and seek feedback opportunities where appropriate.

3.1.2 Engagement calendar

The engagement calendar (Table 6) summarises key in-person or online activities undertaken by MaCoBioS as of November 2022. Informal discussions are not documented.

Table 6. *Summary of key formal external stakeholder engagement activities undertaken across MaCoBioS.*

Activity	Work package (WP) and Task (T) number	Location	Date	Audience	Approx. number of participants/ potential audience reached
Youtube webinar "Econtro Scientia"	WPs 1-4 (all Tasks)	Online	11 Mar 2021	Any interested party, general public	177
Open webinar for World Oceans Day	WP3 (T3.2)	Online	8 Jun 2021	Any interested party, general public	Unknown, no registration was required to join
Participation at the IUCN World Conservation Congress	WP3 (T3.1-3.3)	Marseille, France	3-9 Sep 2021	Broad societal representation from national and regional policy-makers through to civil society organisations	~6,000 attended the congress with >3500 participants online
Participation at the International Conference for YOUNG Marine Researchers (ICYMARE)	WP1 (T1.2)	Online	21-24 Sep 2021	Researchers	511 attended the conference
Survey: 'Public awareness of climate change, its effects and solutions in marine and coastal environments'	WP3 (T3.2), WP4 (T4.2)	Online	16 Nov 2021- 16 Feb 2022	General public	709

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Activity	Work package (WP) and Task (T) number	Location	Date	Audience	Approx. number of participants/ potential audience reached
Focus group discussions	WP2 (T2.2)	Martinique	24 Apr-9 May 2022	Policy-makers, practitioners, fishers, researchers	18
Participation at the European Space Agency Living Planet Symposium	WP1 (T1.3)	Bonn, Germany	23-27 May 2022	Researchers, industry, data users	>5,000 attended the symposium
Survey: 'Stakeholders' perception of Nature-based Solutions implementation'	WP3 (T3.2), WP5 (T5.2)	Online	24 May-3 Jun 2022	Practitioners	8
Interviews	WP2 (T2.2)	Barbados	31 May-7 Jul 2022	Policy-makers, practitioners, civil society organisations	27
Public lecture	WP3 (T3.2)	Kralendijk, Bonaire	21 Jun 2022	Any interested party, general public	50
Participation at the Nature-based Solutions Conference	WP3 (T3.1)	University of Oxford, UK	5-7 Jul 2022	Researchers, practitioners, policy-makers	>300 attended the conference with >650 participants online
Participation at the International Conference for YOUNG Marine Researchers (ICYMARE)	WP2 (T2.1, T2.2)	Bremerhaven, Germany	13-16 Sep 2022	Researchers	333 attended the conference
Participation at Littoral conference	WP3 (T3.2), WP4 (T4.2)	Lisbon, Portugal	12-16 Sep 2022	Researchers	~100 attended the conference

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Activity	Work package (WP) and Task (T) number	Location	Date	Audience	Approx. number of participants/ potential audience reached
Participation at ECSA 59: Using the best scientific knowledge for the sustainable management of estuaries and coastal seas, including co-organising with FutureMares a Special Session: 'Unraveling climate change-biodiversity-ecosystem services nexus in marine coastal environments'	WP2 (T2.1), WP3 (T3.3)	San Sebastian, Spain	5-8 Sep 2022	Researchers, educators, practitioners	>400 attended the conference
Participation at ICES Annual Science Conference 2022	WP1 (T1.1)	Dublin, UK	19-22 Sep 2022	Researchers, practitioners	829 attended the conference
Western Mediterranean ecoregional workshop: Identifying spatial opportunities for marine and coastal NBS	WP2 (T2.1), WP3 (T3.2, T3.3), WP4 (T4.2)	Lecce, Italy	28-30 Sep 2022	Ecoregional, national, regional and local policy-makers and practitioners	10
Focus group discussion	WP2 (T2.1, T2.3), WP3 (T3.2, T3.3), WP4 (T4.2)	Lecce, Italy	30 Sep 2022	Local policy-makers and practitioners	6

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3.1.3 Engagement legacy

Research conducted within MaCoBioS aims to support the implementation of effective marine and coastal NBS. A series of tools and guidance are being developed by the project to assist with specific steps related to the implementation of marine and coastal NBS, or marine and coastal ecosystems management in general. Five tools have been identified for inclusion in the Toolbox:

- a conceptual tool based on a mental model approach to understand the risk change presents to ecosystem services (WP1). This tool helps answer the questions 'what happens to the ecosystem and its services if…?' and 'when and where should action be taken?';
- a methodological framework for assessing adaptive capacity in coastal social-ecological systems (WP2). This tool helps answer the questions: 'will a community be able to adapt to changes?' and 'how can we enhance their adaptive capacity?';
- a cumulative impacts assessment tool for marine and coastal ecosystems (WP2). This tool helps answer the question: 'where is management to reduce local pressures most needed?';
- a decision-support tool that can assist with the integration of environmental, social-economic and governance considerations for the mapping of suitable areas for NBS based on a specific ecosystem (WP3). This tool helps answer the question: 'where can we find the most favourable conditions for intervention?'; and
- a decision-support tool to help plan action(s) in a specific marine and coastal social-ecological system (WP3). This tool helps answer the question: 'what are the potential interventions that could be applied?'.

In addition, information on biodiversity data collection methods used by MaCoBioS, including advantages and constraints, will be provided to inform on their application in future monitoring programmes (WPs 1 & 3). Guidance to inform the integration of marine and coastal NBS into policies and practices will also be included in the Toolbox in the form of policy briefs and guidelines (WPs 3 & 4). An interactive visualisation tool will be developed as a WebGIS portal displaying key ecoregional level outputs from WPs 2 & 3.

Tools have been designed to be complementary, building on knowledge gained throughout the project, but can also be used as standalone procedures. Most of these tools and guidance have been developed with the input/involvement of conservation practitioners and decision-makers through workshops and other engagement activities to ensure they would be useful and relevant for them. Decision-support tools, such as those produced by MaCoBioS, have different benefits and drawbacks for their application by decision-makers. Factors such as accessibility, cost, ease of use, compatibility with other tools/processes already used, level of support, and a competitive landscape of tools and activities at different scales provided will all affect uptake. Developed tools have been designed to address some of the barriers identified by MaCoBioS' stakeholders, such as where, when and how to act (see Deliverable 4.2: 'Stakeholders' concerns and expectations regarding climate change'). The involvement of decision-makers in tool design should also help with utility and compatibility, although requirements are likely to differ across stakeholder groups and countries. Nonetheless, for tools to be useful in new places and by new stakeholder groups, locally/contextually relevant stakeholder engagement will be key. As such, recommendations made at the end of this report should be considered during the design of stakeholder engagement strategies for future tool application.

At the end of the project, the 'News and Views' pages will be complemented and supported with this Toolbox directed at end-users. The Toolbox will be made freely available, and contacts will be provided for each tool that end-users can approach should they need assistance to use them or wish

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to find out more. The Toolbox will ensure the legacy and utility of MaCoBioS outputs once the project period ends.

3.2 Stakeholder engagement and perspectives from MaCoBioS activities

The partners of the MaCoBioS consortium have carried out various stakeholder engagement activities (see Table 6), which has led to a deeper understanding of stakeholder concerns, particularly with regards to: (1) the expectations of how climate change will affect marine and coastal social-ecological systems, (2) levels of support from stakeholders for different policy options such as NBS, and (3) the evidence needed by policy-makers and practitioners for deliberating and implementing NBS in marine and coastal ecosystems together with stakeholders. In particular, the online survey conducted in 2021-2022 helped the project appreciate public perceptions on climate change, threats to marine and coastal ecosystems, and the value they place on these ecosystems, providing the context for understanding the level of demand for action.

The stakeholder workshop coordinated in the Western Mediterranean ecoregion brought together key policy and practitioner stakeholders to discuss the utility of risk assessment and suitability mapping tools for the selection of potential NBS priorities. The Western Mediterranean workshop has informed the development of these tools and will allow new data and insights from stakeholders to be integrated in subsequent iterations. Application of the risk assessment and suitability mapping tools to a marine protected area in Italy will further inform the development of these tools, moving from an ecoregional to a local approach and demonstrating utility. These workshops, coupled with informal discussions, have also enabled MaCoBioS to understand policy and practitioner evidence needs surrounding NBS, creating constructive dialogue and informing outputs to make them more policy relevant.

Finally, attendance at international meetings and conferences has proved insightful for informing current and future work by enabling MaCoBioS and external stakeholders to share understanding and approaches to marine and coastal NBS.

Through the various engagement activities conducted, a number of key lessons have been learned:

1. **Stakeholders are not a homogenous group**.

Stakeholders reflect a wide spectrum of interested and affected parties or beneficiaries at local, national, regional and international levels with a diverse set of perspectives on NBS, their purpose, their impacts, and how to create and implement them. The identification of participants in any engagement activities should therefore be deliberate, being aware of who, why (for the project and for the stakeholder), when, and how. In developing engagement activities and identifying the appropriate persons to contact, consideration therefore needs to be taken regarding the representation of views and whether it is an institutional or personal perspective that is required. Power dynamics also need to be addressed intentionally (Woroniecki et al., 2020). The level of engagement required, or achievable, from different stakeholder groups will likely vary depending on the objective of engagement. The mechanisms that best suit different stakeholder groups and different objectives will also differ. A variety of tools is therefore likely to be required to facilitate engagement and knowledge exchange, with the choice of tool determined by the purpose of the stakeholder engagement activity and its desired outcomes, including tailoring the approach to the stakeholder group whose perspectives are desired.

2. **Stakeholder engagement takes time and resources from all parties**.

For participation to be worthwhile, stakeholders need to perceive they are gaining sufficient value from the activity to be worth their time and resources. The short and long-term benefits of any NBS should be clearly communicated to people to increase understanding of the purpose and intention of

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these, and to strengthen their legitimacy and acceptance among the public. Furthermore, those organising the activity need to be clear on the objective of the activity and perceive it is worth their time and resources. Engagement activities and contact with stakeholders should be managed to ensure they maximise opportunities in an effective way. Developing a stakeholder engagement plan will help maximise engagement, ensure consistent communication of engagement activities and expectations with stakeholders and streamline resources and activities. However, it is critical to recognise the time and effort put in by stakeholders, target the appropriate stakeholders, ensure the requirements for participation are not too demanding, and embed added value for them into the engagement process. Putting the mechanisms in place to ensure worthwhile stakeholder engagement may also help reduce consultation fatigue. Engagement activities should therefore build in a rationale for the value of each activity for stakeholders and a plan for the timely dissemination of outputs.

3. **Stakeholder engagement should be embedded into all activities, where relevant**.

There is a clear view that stakeholders should be embedded into research projects, from conceptualisation to knowledge development and utility (Mackinson et al., 2011, Chilvers and Kearnes, 2016). However, true collaborative research is difficult, requiring cultural integration, alignment of interests, relationship development, and overcoming barriers such as time, capacity or language (Schoonover et al., 2019). NBS is a new concept and does not yet have a legal framework or specific policy in place that guides their implementation in the countries and territories MaCoBioS is working in. MaCoBioS is therefore working ahead of policy direction and, without this driver, already stretched policy-makers and practitioners working at the national level may struggle to invest time, effort and financial capacity in theoretical underpinnings and pilot studies. Research projects are also time-limited by their funding, and the societal challenges they seek to address are complex, generally being difficult to clearly define or solve (Bammer, 2019). This process presents challenges for relationship development, identifying who to involve, and how stakeholders can be engaged with. These challenges are compounded by the plethora of research projects being conducted simultaneously, often on related topics, creating overlap across the stakeholder groups targeted for engagement and which can lead to stakeholder fatigue. It is therefore important to consider: who should be involved; why they should be involved (from both a research and stakeholder point of view); when they should be involved; and which forms of stakeholder engagement are most appropriate. When considering the potential for stakeholder engagement, it is important to ensure participation that leads to meaningful outcomes for those who give their time to participate, while managing stakeholder expectations and ensuring that societal partners understand that research projects have no control over how policy and practice integrate their findings (Schoonover et al., 2019).

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4. Conclusions and Recommendations

Implementing and researching NBS will require collaboration across multiple sectors and stakeholder groups if new ways of thinking, organising, and doing are to be integrated in their approach in order to move environmental and social outcomes beyond those already achieved by established approaches for environmental management. While governments will establish the policies and legal frameworks that regulate NBS implementation, involving citizens and businesses early on in the process is important in order to build awareness about the justifications and reasons for NBS and to gain broad support for decisions on NBS and their implementation. Networks involving various stakeholder groups, including society, business, science and government, will therefore be needed to co-create knowledge and solutions to sustainability challenges. Stakeholder engagement will therefore involve the identification of relevant groups, relationship-building, alignment of interests, effective communication, dialogue, and knowledge exchange (Smith, 2017, Kujala et al., 2019).

Informed by our review of participation practices in MSP implementation, and experiences within MaCoBioS, here we make three key recommendations for stakeholder engagement in future state-led and research projects:

Recommendation 1: **Communicate, plan ahead, but be willing to learn and adapt**

- The effective development, adoption and implementation of environmental research and management through mechanisms such as NBS will largely be determined by the extent to which all stakeholder groups understand the need, purpose and process, and how much they think it reflects their current and future aspirations and interests.
- Clear objectives for what the NBS and associated policy changes are trying to achieve, the role of engagement and anticipated outcomes, together with a rationale for why stakeholders should be involved, will improve their motivation to get involved (buy-in) and help manage expectations about what their involvement will achieve.
- A stakeholder engagement strategy or plan specifying who, when, why and how stakeholder groups will be engaged should be developed and shared with relevant stakeholders as early as possible. It should make sure stakeholders are aware of participatory processes, iterative opportunities to get involved and the likely timeline of the participatory process. A complementary communication plan should be developed to ensure consistent messaging and to provide all stakeholder groups with the information they need to effectively and meaningfully participate and have their perspectives included in the further development of research projects and the potential creation of NBS. This includes bringing stakeholders up to speed on the challenges faced, potential solutions, the objectives of engagement, and the roles of relevant institutions and groups. Simple, jargon-free communication materials using clear language and a range of formats should be developed.
- Stakeholder engagement is susceptible to underlying power dynamics and pre-existing inequalities. Ensuring that representation is not concentrated on particular groups who have vested (economic) interests and/or powerful actors but rather is fair and reflects a broad range of economic, environmental and societal stakeholders and goals is key. NBS represent a paradigm shift, with priority being given to protecting environmental resources and biodiversity and second to fostering social or economic use of marine resources in a way that addresses other societal challenges. Given this, ensuring balanced representation will be critical for successful NBS.

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Recommendation 2: **Engage stakeholders early on in the process**

- Stakeholder engagement is a key component of research, policy and practice.
- Stakeholders should be brought to the table as early as possible, including during problem formulation and development of objectives and end goals, and have the opportunity to be continuously involved. However, not all stakeholders need to be involved at all times and in all processes. Identifying stakeholders to involve, when and how is key to ensuring successful and meaningful engagement.
- There can be a dichotomy between broad, democratic societal participation and process efficiency, often due to funding constraints in research and the need to quickly and efficiently address societal challenges and/or conflicts and promote sustainable development in policy and practice. Engaging stakeholders as early as possible enables greater levels of debate and input, may improve stakeholder's interest in engaging and their buy-in to ultimate decisions, may avoid undermining conflicting interests, and can help to overcome criticisms of 'tokenism' engagement that comes too late in the process to affect decisions in a meaningful way. While it may slow a process down, the development of long-term relationships would likely improve motivation for engagement and trust amongst stakeholder groups and with the government.
- Existing networks may help facilitate access to representatives of stakeholder groups, streamline consultation efforts, particularly across research projects, and reduce consultation fatigue. Stakeholders could also be embedded as official project partners. However, it is unlikely that all stakeholders relevant to a project or policy/practice area will be represented in these networks, and it is important not to underestimate the time required to establish and maintain relationships from all parties.

Recommendation 3: **Engagement is more than a one-way process and requires a combination of formal and informal arrangements**

- True engagement should be seen as a two-way process, not just a one-way flow of information. Effective engagement, particularly of some sectors, requires long-term cooperative relationships to build trust, interest, and capacity.
- Informal processes allow for more in-depth and freely spoken stakeholder engagement, build relationships, increase understanding of the problem and the views of other stakeholder groups, and can facilitate a way for bringing in a bottom-up approach to decision-making by increasing citizen participation and reducing the top-down nature of engagement. It can also help identify and bring in new stakeholders to the process.
- Informal elements can facilitate emerging behaviour and actions by individuals, groups and networks to interact in a collaborative way which can be influential at the local level, particularly in raising awareness.
- Nonetheless, formal arrangements remain an important part of the engagement process, with how outcomes of these are acted on often formally reported on.

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