1.3.1.5 Most appropriate geographical scale for MSP at national scale

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Foreword

This report was jointly conducted under both Supporting Implementation of Maritime Spatial Planning in the Western Mediterranean region (SIMWESTMED) and Supporting Implementation of Maritime Spatial Planning in the Northern European Atlantic region (SIMNORAT). As a result, the first draft of each was similar and the difference results from partners' content revision.
This report identifies and suggests a number of criteria or guiding principles relevant for ensuring that appropriate geographical scale and boundaries are defined, in order to support the MSP Directive implementation process, and take into account transboundary issues in defining scales and boundaries.

Introduction

Among the 62 non-European Marine Spatial Planning (MSP) processes reviewed by the European Commission in its "MSP in Practice Initiative database" (2017)[1], 21 were at local scale (e.g. bay, county, district), 23 at sub-national scale (e.g. state, province), 11 at national scale (e.g. country-wide, island), 7 at Regional scale (e.g. international transboundary) ranged from 2,000 km2 (Wider Caribbean) to 35,716,100 km2 (Antarctic). Moreover, in this database, some countries have a combination of the different scales: national, sub-national and local (for instance in France, Scotland or China).

Among all these scales, is there only one appropriate scale for MSP? In a pragmatic manner, the MSP directive requires the Member State (MS) to develop and produce "plan or plans in accordance with the institutional and governance levels determined by Member States" (MSP directive, art. 4.3).

Therefore, when faced with MSP directive implementation process, MS have to answer the following questions: what is the most appropriate scale for their MSP plans? Do they have to define different plans based on different geographical scales? If so, what would be their articulation? If not, for instance, is it enough to carry out the plan at national or marine basin scale with some focus areas? Moreover, what would be the plan boundaries once the scale is defined?

The determination of a relevant scale is thus a systematic question in the development of a MSP project. The question of scale also influences the way in which the stakeholders will be involved, the final form of the plan and the actions that will be carried out (Minang et al., 2015).

This document proposes an up-to-date literature review about this concept, and suggest principles to follow in scaling the plan, defining its boundaries and the number of plans to develop within a country, always taking into account transboundary issues.

1 The database is available at the following address :http://msp-platform.eu/events/global-msp-inventory-available-now-cross-border-msp-study [accessed February 16th 2018]

1. Scales and delineation of the planning region: two different notions

To better understand the question of scales, it is firstly important to understand the different definitions that are given to the "scale" term. The definition of scale in the fields of geography and ecology induces notions of spatiality and temporality (Cumming et al., 2006). Taking into account sociological elements, "scale adds to these notions, ideas of representation and organization" (Cumming et al., 2006) referring to existing institutions and governance mechanisms. This definition, including institutional aspects, can be precised with Minang et al. (2015), who cite the Millennium Ecosystem Assessment (2003) "[...] a level of organization is not a scale, but it can have a scale". Depending on the ecological and socio-economic and institutional approaches, there are important stakes in the definition of "scale" which can influence, subsequently, the way in which the determination of the scale of a MSP project will be addressed (cf. Figure 1).

To take into account all these considerations, we define here a scale as a jurisdictional, ecological and socio-economic level of the MSP process and its components (sub-process, activity and phenomenon), in space and time.

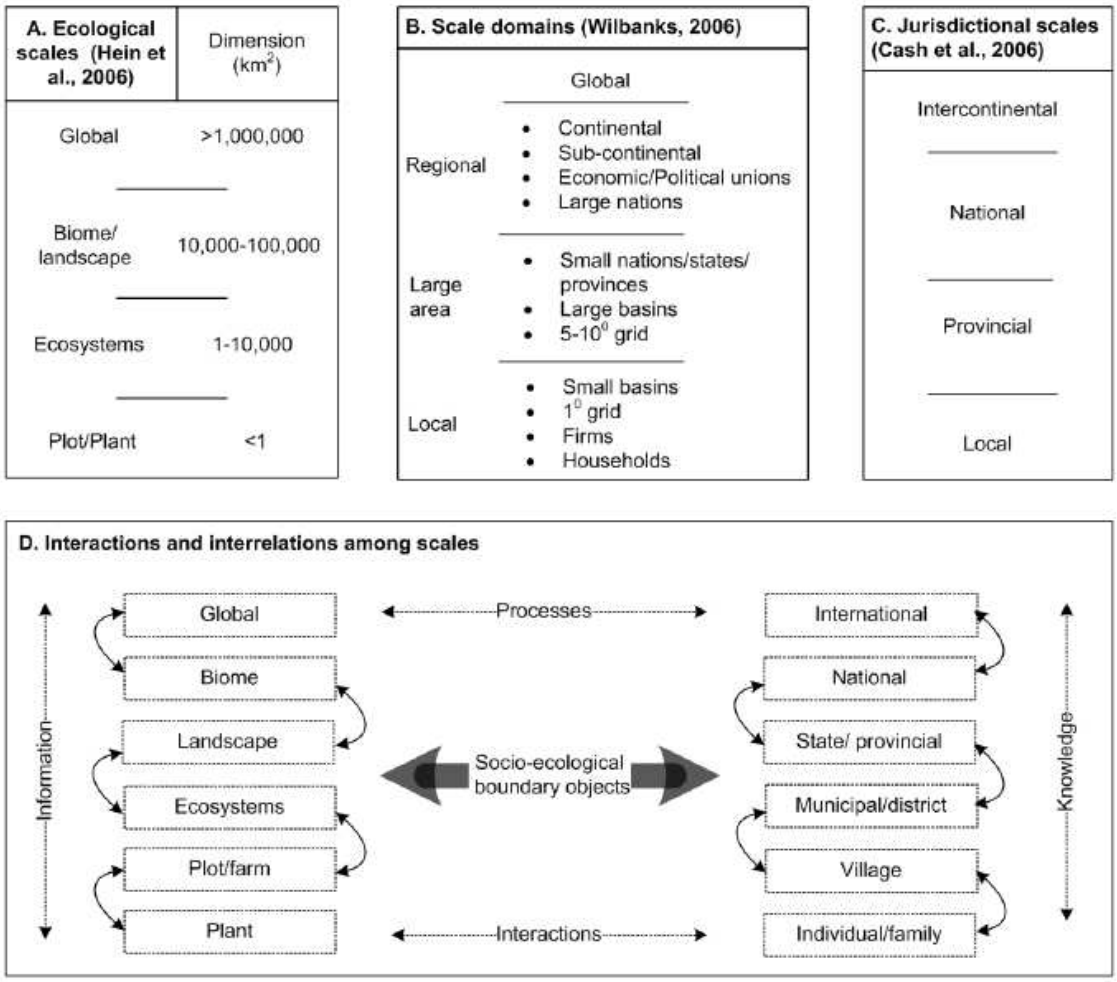

Figure 1: Hierarchical representations of scale and scale interactions (Source: Minang et al. [2015])

1.1 The delineation of physical boundaries

The delineation of units is a necessary step prior to the implementation of a planning process. Mills et al. (2010) suggests that the delimitation can be "arbitrary", based on anthropic considerations (property boundaries, policies), based on natural boundaries or a compromise between these three criteria (e.g. Lewis et al., 2003). The explicit consideration of boundaries promotes the appropriation of planning by relevant stakeholders by facilitating the transition between planning and designing the actions envisaged (Mills et al., 2010). In 2008, Gilliland and Laffoley (2008) defined three characteristics for the delimitation of the boundaries of maritime areas: along (lateral), landward and offshore the coast.

In a number of cases, the delimitation of the lateral borders raises the issues of cross-border cooperation. However, national land borders and their extensions at sea rarely correspond to the ecosystem boundaries, which the scales of MSP should integrate to avoid scale mismatches (see 1.2) These ecosystem boundaries can be assimilated to ecoregion or bioregion. These are based on biogeography, oceanography and bathymetry, define relatively homogeneous biological and physical components, distinct from adjacent regions, and wide enough to cover ecological and evolutionary ecosystems (Mills et al., 2010).

Since, MSP can play a very useful role in determining directions for the sustainable and integrated management of human activities at sea, the preservation of the living environment, the fragility of coastal ecosystems, erosion and socio-economic factors, MSP plan need to take into account land-sea interactions (LSI) and thus have landward boundaries defined (Gilliland and Laffoley, 2008). Indeed, MSP should aim to integrate the maritime dimension of certain coastal uses or activities and their impacts and, ultimately, provide an integrated and strategic vision (EC, 2014). The delimitation of the terrestrial limit of a maritime spatial planning is dependent on the issue (environment, professional activity, port, etc.). However, for legal reasons (Gilliland and Laffoley, 2008) a land boundary must be defined for the planning process. This delimitation of terrestrial boundaries also raises the question of the interaction between terrestrial planning policies established in most countries and the MSP boundaries. For the authors, it is relevant to extend the boundaries of the MSP on intertidal zones taking into account the environmental interactions between land and sea and encouraging integration between terrestrial and marine planning activities and institutions "(ibid). For Carneiro et al. (2017) "coordinating planning on land and at sea makes it possible to optimize the implementation of infrastructures and services on the land required for activities at sea, and vice versa". In addition, the 2014 Directive establishing a Maritime Spatial Planning Framework clarifies the consideration of LSI as a minimum requirement for MSP by MS (EC, 2014).

In practice, the definition of extra-coastal limits of planning is likely to be determined by the limit of national jurisdiction which characterizes the end of States' legal competencies at sea. However, in the same way as for lateral boundaries, EEZ boundaries seldom align with ecosystem boundaries (Gilliland and Laffoley, 2008) or marine bioregions. The MSP directive stresses that "In order to ensure consistency and legal clarity, the geographical scope for maritime spatial planning should be defined in conformity with existing legislative instruments of the Union and international maritime law, in particular Unclos [the United Nations Convention on the Law of the Sea of 1982]" (EC, 2014), which represents a certain limit in the definition of MSP offshore physical boundaries.

1.2 A plan, two types of boundaries

The definition of the most appropriate geographical scale is important because of the differences that may exist between ecosystem scales and scales of existing governance systems (Cumming et al., 2006). According to Minang et al. (2015), in a landscape context, the planning process starts with seeking scales of minimal compromise at which the social system (for example, the institution) can optimally tackle ecological processes. In the case of Marine Planning, Gilliland and Laffoley, (2008) also recommend a hierarchy of spatial scales that comprises, as a minimum, national and sub-national (e.g. regional) levels (see 3).

The literature review also points out that in the delineation of an area for the development of MSP, a relative consensus seems to exist on the difference between two types of boundaries: the boundaries for the analysis and the boundaries for the management (Ehler and Douvere, 2009; Gilliland and Laffoley., 2008; Mills et al., 2010; Ansong et al., 2017). The argument for this distinction is that the management boundaries often match administrative boundaries (for political purposes), which do not generally correspond to the boundaries of a single ecosystem (Ehler and Douvere, 2009). This is also supported by the consensus in favour of the ecosystem approach, which can provide a solid foundation for the ecosystem-based approach in MSP process (Ansong et al., 2017; Maes, 2008; Flannery and O'Cinneide, 2012; Jay et al.,016; Dunstan et al., 2016).

Indeed, an administrative region often encompasses multiple ecosystems, of different sizes and sometimes only some parts of an ecosystem. As a result, analysing phenomena whether environmental or socio-economic only within the administrative boundaries could lead to misunderstanding of these phenomena in as much as the latter could be broader. This could lead to the failure of the plan, as a consequence of a mismatch between ecological scale and social/management scale (Cumming et al., 2006; cf. Figure 2). That is why the boundaries of analysis should not be limited to the boundaries of management.

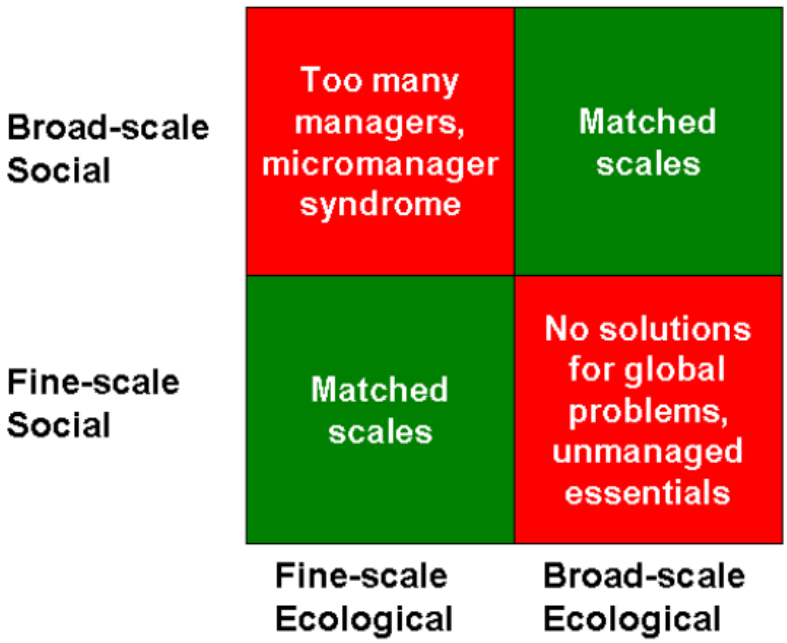

Figure 2: Consequences of mismatched spatial scales (indicated in red) between social and ecological systems (Source: Cumming et al. [2006])

Considering the separation between those different types of boundaries, the reality of MSP implementation is often complex. Mills et al. (2010) listed several important scale and boundaries considerations during a conservation planning process: extent of the bioregion, extent of governance area and cultural systems, extent and availability of data, opportunities and social constraints. Some of the steps and items could be applied to a MSP process. Thus, a principle about the definition of different types of boundaries, namely analysis and management boundaries (Ehler et Douvere, 2009; Gililand and Laffoley, 2008; Mills et al., 2010) - seems to emerge. This level of analysis can then lay the foundation for different management scales depending on: the size, density and characteristics of planned or existing activities, their impacts, environmental vulnerability and existing governance structures (Flannery and O'Cinneide, 2012; Ehler and Douvere, 2009) in order to apply MSP according to the zone and the type of activity. Works on this topic advance the interest of being able to identify and differentiate the planning proposals according to the peculiarities and the characteristics of each local area (Barbanti et al., 2015). Flannery and O'Cinneide (2012) envisaged that "densely used or particularly vulnerable areas may require more prescriptive spatial plans whereas areas with low density of use may only require general management principles".

Besides, social opportunities and constraints, institutional capacities and support for conservation actions are likely to determine the feasibility and effectiveness of planned actions (Mills et al., 2010). This is the reason why Minang et al. (2015) also consider a "planning facilitation scale" as an important scale to consider when dealing with landscapes planning process, which would be also relevant for MSP. Indeed, planning facilitation calls for consideration of the potential for social support for a MSP project. It also involves attention to the resolution and availability of data. Very few regions have consistent data at an appropriate resolution for landscape planning, and probably for MSP. Most data are limited, highly fragmented and sectoral (ibid). Moreover, the processing and standardization of data can be a significant burden for project developers (Jay et al., 2016). Therefore, since it will influence the issues that will be addressed, the resolution of the data to be assembled and the objectives that will be defined (Smith et al., 2012), the scale of a MSP is critical in different stages of the MSP process (Mill et al., 2010).

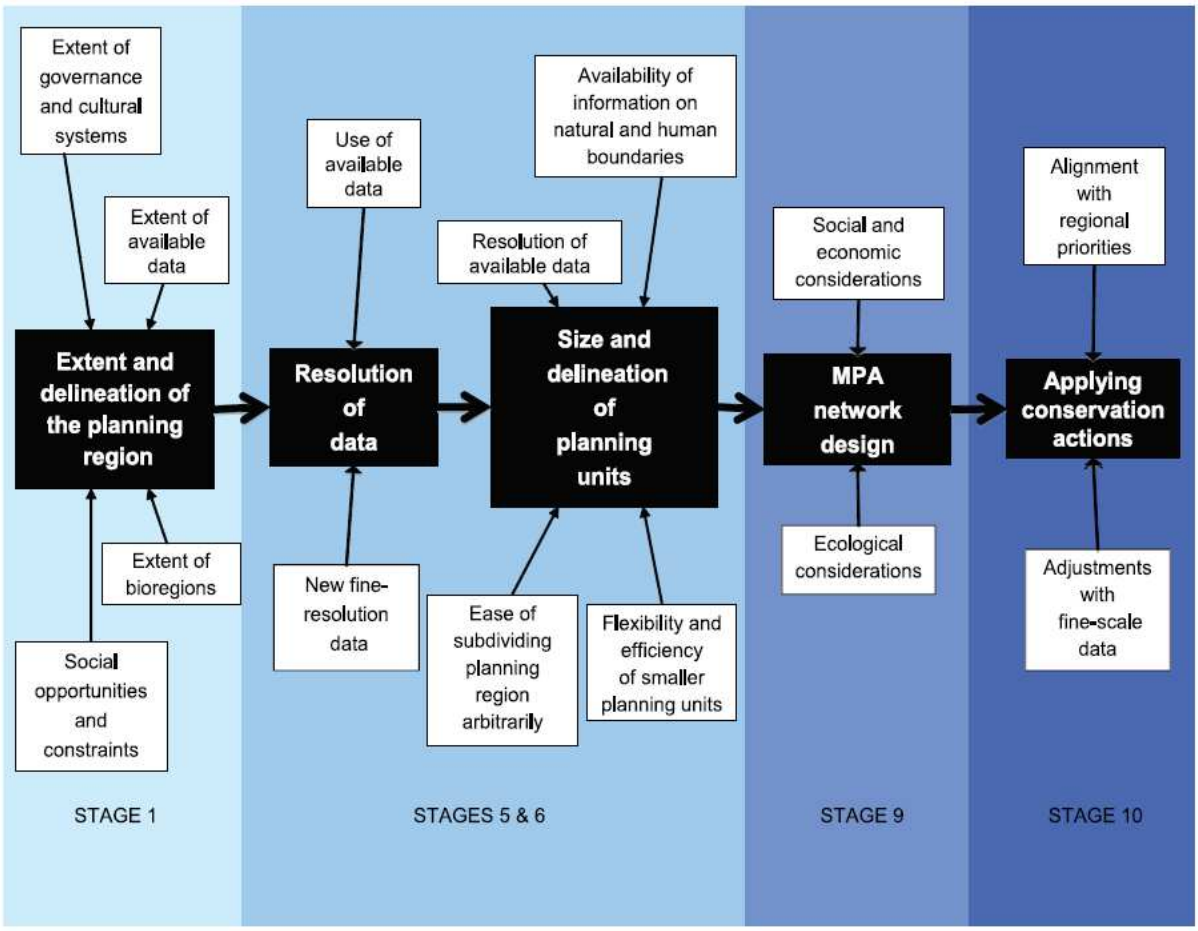

Figure 3: "Spatial scale considerations during a conservation planning process (black boxes). White boxes show elements that influence the decisions within the process. Stages are the following: (1) scoping and costing; (5) compiling data on socio-economic variables; (6) compiling data on biodiversity and other natural features of interest; (9) selecting new conservation areas; and (10) applying conservation actions" (Source: Mills et al. [(2010])

2 The scale in the ecosystem approach (ecosystem-based management)

The ecosystem approach also called ecosystem-based management (EBM) is a management approach "based on a particular area defined by the location of a given ecosystem" (Queffelec, 2013). This notion of approach based on ecological science and broadened to integrate human intervention is more and more successful and is considered by some as "a fundamental unit for MSP, working towards ecosystem" (Jay, 2010), "and has since long been advocated in biological sciences and fisheries" (Maes, 2008). For Wang (2004), maintaining the integrity of an ecosystem requires management actions to "cover a wide range of components, including not only the targeted resources, but also habitats, communities, and the related environment that support them. It means that the spatial scale of management has to extend across different biological units and jurisdictions to encompass an entire ecosystem". For these advocates, this approach ensures that planning and management units are defined in an environmentally manner and provides a systematic and spatial framework for smaller scale planning and environmental assessment. It also helps scientists to understand biogeographic models and convey information. A boundary based on ecological considerations "also makes it easy to identify the connected stakeholders that can propose solutions and measures to any kind of externality that might impacts the ecosystem" (Ansong et al., 2017).

The European Union has regularly emphasized the strategic role of the ecosystem approach in the management of transboundary resources. The EBM principle has also been adopted on the Maritime Spatial Planning Roadmap (COM [2008] 791 - 25 November 2008) and endorsed as a key principle in the development of MSP in its framework directive : "An ecosystem-based approach should be applied in a way that is adapted to the specific ecosystems and other specificities of the different marine regions "(art (14) Directive 2014/89 / EU). A reminder of these European recommendations appears, more recently, in a report from the European Commission on good practices in the ecosystem approach and cross-border cooperation (Carneiro et al., 2017).

At the regional Mediterranean level, ecosystem approach has been acknowledged by the Contracting Parties to the Barcelona Convention as an overarching principle of UN Environment/Mediterranean Action Plan Barcelona Convention system. Moreover, the UN Environment/MAP Barcelona Convention Conceptual Framework for MSP in the Mediterranean attached as Annex II to the Decision IG. 23/07, adopted by the Contracting Parties in their COP 20 (Tirana, Albania, December 2017), recognised the Ecosystem Approach as a guiding principle for Marine Spatial Planning.

Internationally, it is worth to mention the Joint roadmap ("to accelerate Maritime/Marine Spatial Planning processes worldwide") agreed between the Directorate General for Maritime Affairs and Fisheries of the EC (DG MARE) and the Intergovernmental Oceanographic Commission of UNESCO (IOC-UNESCO) on March 2017. In this document it is stated that "IOC- UNESCO aim to promote EBM, including through the development and dissemination of the MSP approach [...]". This Joint Roadmap, moreover, defines priority areas and strategic objectives for mutual cooperation. The Priority area 3 "EBM/MSP", recalls "that the MSP Directive requires the use of an ecosystem-based approach, which should ensure that the collective pressure of maritime activities is kept within levels compatible with the achievement of the good environmental status" that the Marine Strategy Framework Directive requires[2].

However, despite international recommendations to develop this approach in the implementation of MSP, plans and administrative boundaries often do not match the boundaries of ecosystem processes (Ansong et al.,017). This is even more pronounced in Europe where marine jurisdictional boundaries are "so close and where many states are involved". The concepts of integrated and ecosystem-based management seem to be often too broad, too abstract, and too complex for to be operationally implemented (Douvere, 2008; Queffelec, 2013). Moreover, for some, even if

2 The document is available at the following address:
http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/SC/pdf/Joint_Roadmap_MSP_v5.pdf [accessed February 16th, 2018]

international instruments exist, EBM may represent legal problems in a cross-border context when the jurisdictional boundaries do not coincide with ecosystem boundaries and include several instruments and laws in different countries (Wang, 2004). That is why Ansong et al. (2017) suggest to start the analysis for a MSP implementation process with a bioregion scale.

3 Multi-level governance and hierarchisation of scales

Without questioning the value of an ecosystem approach to a scale of analysis, many authors emphasize the need to define different levels of complementary and coordinated policies at many scales (Douvere and Ehler, 2008; Gilliland and Laffoley, 2008) sometimes based on existing institutions. According to Maes (2008) "the various forms of coastal and ocean management carried out by coastal states in their jurisdictions" (some of which are already MSP-approach oriented) already make it possible to locally decline certain actions at different local scales. That is why Minang et al. (2015) also consider the interlocking or nested scales criteria as a third scale-related dimension in addition with the spatial analysis and planning facilitation scales. The nested scales refer to the strengths and constraints of each level from international to local one and the horizontal interactions within a scale (Minang et al., 2015). In fact, the development and implementation of MSP is not limited to determining the right scale of action, it is also a question of coordinating the different levels of intervention (Queffelec, 2013).

While the scales at which each level is defined may differ from one country to another (Gilliland and Laffoley, 2008), some scales seem more likely to carry particular challenges according to the specialized literature.

3.1 The intakes of local scale plans

The literature that has been consulted about this topic was mostly focused on management of marine protected areas in small islands. Thus, it has to be adapted to the context of the zone where a MSP is considered.

The local scale is often presented as the most likely to bring concrete actions on spaces. According Govan et al. (2009), local initiatives can be successfully implemented because they address local issues in a culturally sensitive manner. In the case of conservation planning, for example, it is precisely the social support that offers a particular interest. Social opportunities and constraints, institutional capacities and support for conservation actions are presented by Mills et al. (2010) as indicators of the feasibility of conservation actions. For the authors, "small planning units are more efficient than larger planning units, requiring less total": smaller planning units are also likely to achieve targets with smaller overall costs. In addition, they can bring more flexibility to develop more appropriate protected area settings. In this case, Wang (2004) quotes that global and macro-regional seas mechanisms are "generally too large, too expensive, and too politically divisive to be operationally effective in ocean management".

In a context where ocean ecosystems are "subjected to external forcing across a multitude of temporal and spatial scales that shift the provision of ecosystem services", local governments are also perceived as the most capable of determining the benefits and drawbacks that could bring each action to a space (Sanchirico, 2010). However, the local scale presents limits in the response to global issues. For example, "environmental changes induced by global drivers are beyond the control of locally based governance arrangements" (Serrao-Neumann et al., 2016) and actions based on local initiatives are more generally focused only on sectoral issues of some communities.

3.2 The intakes of national and regional scale plans

Gilliland and Laffoley (2008) mention that "it is helpful to define "broad scale" as approximately "regional", as suggested in a number of reviews [Defra, 2004], reflecting important oceanographic and biogeographic processes and the way in which industry and others divide up the sea for planning purposes". Regional and international plans are indeed presented as relevant scale for planning integration and coordination (Douvere and Ehler, 2008). This allows planners to take into account spatial context for conservation decisions, complementarity and connectivity between areas, threats to natural features and relationships between different human activities to improve the effectiveness of local strategies (Serrao-Neumann et al., 2016).

However, according to some authors, most assessments at the regional scale confine to prioritization exercises (Mills et al., 2010). Nevertheless, connecting regional assessments to local action is more and more acknowledged as a major issue (Knight et al., 2006). Thus, scale-related decision play an important role in ensuring the achievements at local scale of conservation planning at regional scale (Mills et al., 2010) and probably in MSP. Regarding regional and sub-regional scale, Regional Seas Conventions such as the Barcelona Convention and its framework The UN Environment/MAP Barcelona Convention Conceptual Framework for MSP in the Mediterranean are existing tools. Which are worthy to mention. Indeed, they support regional and sub-regional coordination and ensure contribution of marine spatial plans to the regional and global environmental objectives[3].

3.3 The intakes of nesting scales

The challenge of governance at multiple levels is therefore that of the good articulation between local, regional and national scales. Indeed, the mismatch (Mills et al., 2010; Agardy et al., 2011) also called "misfit" (Ouréns et al., 2015) encompasses the failure of regional planning and actions at the local level to inform each other (Mills et al., 2010) in order to ensure the good sustainability of the management of socio-ecological systems (Ouréns et al., 2015). Different variations can therefore be developed depending to the countries with regard to the existing administrative structures. Thus, most of the work done on this topic recommends the implementation of regional, national and local marine spatial plannings (Flannery et al., 2015; Douvere and Ehler, 2009; Maes, 2008; Barbanti et al., 2015).

The European Commission encourages the definition of strategic objectives for the MSP at sub-national or national level (EC, 2008). These strategic objectives must then be further defined by operational objectives. "Strategic objectives are generally ambitious whereas operational objectives are generally articulated in terms of measurable quantities" (Flannery and O'Cinneide, 2011). The operational objectives can then be broken down into smaller, more flexible and more efficient planning scales (Douvere and Ehler, 2008, Gilliland and Laffoley, 2008; Barbanti et al., 2015; Mills et al., 2015). Such an approach that allows each "level to provide context for the level below will provide the most effective and least complicated arrangement" (Gilliland and Laffoley, 2008). On this model, ecosystem processes are taken into account at global scales and then a hierarchical approach addresses different issues at each scale from global to local (Barbanti et al., 2015). In line with an approach by different levels of governance, adjustments to plans are needed, as new information appears at scales different from those at which the plan was developed: A common example is the need for regional-level plans to accommodate data inequality at the local level (Mills et al., 2010). The ability to interact with multi-level institutions and respond to ideas of different scales of concern can help ensure implementation of the plan and that the resulting local actions achieve emerging regional goals such as complementarity and connectivity.

3 More information are available at http://web.unep.org/unepmap/ [last accessed on August 22nd, 2018]

Nested scales and stakeholder engagement

Taking into account another key area for MSP step that is stakeholder participation, "governance arrangements are likely to be heavily shaped by practical issues such as the geographic scale of each planning unit, sectoral scope, and the resources available [...]. However, the level of stakeholder engagement will be an important factor in the success of MSP" (Gilliland and Laffoley, 2008). In this regard, Dunstan et al. (2016) propose an example of hierarchical levels including:

"1) A small single sector/use stakeholder engagement with aspirational objectives focused on the needs of that sector and consideration of a limited set of political, economic, social or ecological / biological objectives.

2) Multiple sectors considered with multiple political, economic, social or ecological/biological objectives.

3) Consideration of all sectors, current states and future activities. All political, economic, social or ecological / biological objectives".

3.4 The importance of the cross-border approach

In view of the principles of the ecosystem approach, the decision criteria for the implementation of the MSP takes on fundamentally cross-border dimensions (Jay et al., 2016) and particularly in the European context. The issue of international cooperation is an integral part of the ecosystem approach to MSP and there is some kind of scientific consensus on the need for this cross-border approach (Flannery et al., 2015; Foley et al., 2010; Zaucha, 2014). A literature review made by Jay et al. (2016) presents various advanced criteria for demonstrating the interest of the transboundary approach in marine planning: "Firstly, the natural environment is fluid, with much greater material movement across administrative borders, including that of substances and species. [...] Secondly, many marine resources and maritime activities are also cross-border and mobile in nature; their effective planning and management requires a collaborative approach from neighbouring jurisdictions [...] Thirdly, physical boundaries are generally absent in this more remote ,dynamic and graded environment, making it difficult to contain many activities and their impacts within administrative territories. Fourthly, MSP is generally being conducted at large geographical scales, including consideration of regional and land–sea interactions."

The authors note tensions and difficulties between scientific management and effective resource management on a transboundary approach (Jay et al., 2016; Gilliland and Laffoley, 2008): "Since national boundaries do not conform to ecosystem boundaries, the boundary question is often seen as a constraint for effective management" (Maes, 2008). Various arguments are put forward to explain these tensions: a legal basis for defining a transboundary zone barely exists, and national and sub-national authorities therefore select the jurisdiction of the MSP over their waters (Jay et al., 2016). Indeed, borders shape "political sovereignty, national and sub-national administrative systems and the potential reach of certain maritime activities" (ibid). This creates tensions between the national interests contained in the territories and the common interests for which a transnational perspective is seeked (ibid). In addition, considerable differences may exist in governance between jurisdictions (Flannery et al., 2015; Jay et al., 2016), practices in policy, scheduling and goals, etc. Jay et al. (2016) also note that: "there may be procedural obstacles for authorities seeking to work together across borders, including uneven administrative structures and processes, technical difficulties in sharing information, language barriers and other barriers to good communication". The offshore planning limit is therefore likely to be determined by the national jurisdictional limit (Gilliland and Laffoley, 2008), which seldom aligns with the boundaries of an ecosystem and there is an overall lack of international perspective in MSP initiatives (Douvere, 2010).

Nevertheless, the transnational recommendations to promote these transboundary approaches increase (Flannery et al., 2015) and allow a certain development of cooperation on the uses of the sea. Indeed, international conventions such as OSPAR, HELCOM (Flannery and O'Cinneide, 2011;

Douvere, 2008; Smith et al., 2012) or the Barcelona Convention (Gilliland and Laffoley, 2008) and regional maritime agreements (Kidd and Shaw, 2013) have been important drivers in development of these cooperation's. Cross-border imperatives have therefore been recognized in political circles particularly in Europe, where the need for cross-border cooperation is accentuated by geography and pressures on the marine environment (Jay et al., 2016). In European legislation, the Water Framework Directive, Marine Strategy Directive, or Environmental Assessment Directive, to name a few examples, contain obligations for cross-border cooperation (Queffelec, 2013). The MSP Directive also mentions that coastal MS shall cooperate in the marine region involved (EC, 2014). In addition, in 2017, the European Commission published a report recalling the importance of cross-border development and disseminating some good practices to achieve this (EC, 2017). Besides, several projects promoting cross-border cooperation for the implementation of MSP have been leaded on the European maritime basins: TPEA, SIMCELT, Celtic Sea Partnership and currently SIMNORAT for the Atlantic sea basin; MAREMED, COASTANCE, PEGASO (non-exhaustive list) and currently SIMWESTMED for the West Mediterranean sea (non-exhaustive list).

The spatial scale at which cross-border cooperation can be organized is not predefined. The MSP directive (EC, 2014) establishes that: "cross-border co-operation is implemented through: (a) existing regional institutional structures, such as regional seas conventions; and or (b) networks or structures of the competent authorities of the Member States; and or (c) any other method that meets the requirements of paragraph 1, for example in the context of the sea basin strategies".

Conclusion and guiding principles

The decision-making process regarding the geographical scale of maritime spatial planning is largely dependent on the context, the objectives set, the level of use of space, the conflicts (Gilliland and Laffoley, 2008) and the vulnerability of the concerned spaces (Flannery and O'Cinneide, 2015). Numerous practices already exist and are determined by phenomena related to historical contexts, jurisdictional limits or particular opportunities.

An other important topic in this review is that there is not a single consistent scale. There are multiple scales adapted to the different stages of the process of implementation of the MSP (Analysis, stakeholders participation, actions, etc.). Indeed a different scale may sometimes be relevant for a particular step in the process of a MSP project. It is the proper articulation of the scales throughout the process that will be the subject of a supported reflection.

The literature review highlights a distinction between two main scales :

- The analysis scale will comprise ecosystem boundaries and processes, as well as transboundary items. It will be the broader and the one in which the definition of the strategic objectives will be based.
- The management scale would be an integral part of the planning boundaries, related to the definition of focus areas where operational objectives will be developed.)

Besides, this study makes possible to identify and sometimes extrapolate from the literature review some criteria and principles to determine appropriate geographical scales to implement MSP:

Overall criteria

1) The operational ecosystem approach;

2) Land-sea interactions. The consideration of land-sea interactions is consistent with other formal or informal processes, such as integrated coastal zone management;

3) The Cross-border issues.

Guiding principles

- Be sure to define each type of boundaries: offshore, landward and lateral and air, water surface, water column and deep-sea soil and underground boundaries;
- Always take into account that the sea has a clear, three-dimensional spatial scale that is difficult to represent on two dimensional-maps;
- To ensure an operational ecosystem approach, start with a bioregional scale (e.g. marine bioregion) in order to understand the ecosystem, take into account coastal and near shore waters and LSI, then make some focus on specific areas if necessary. It is also important because MSP's environmental objectives will only be met when MSP also addresses environmental effects beyond the planned area;
- It is necessary to distinguish two types of scales: analysis scale and management scale. Indeed, analysing phenomena whether environmental or socio-economic within the administrative boundaries could lead to misunderstanding of these phenomena and thus mismatch with the planning boundaries in as much as the latter could be broader;
- Where planning and ecosystem boundaries do not match, analyze what it implies and set up appropriate measures to achieve coherence;
- Differentiating an analysis scale from a management scale could then lay the foundation for

different management scales depending to the peculiarities and the characteristics of each local area. Areas with specific marine environment elements, multiple uses of, multiple pressures on may require detailed spatial plans , finer than plans at an EEZ or sub -egional sea level;

- Each scale from bioregional to local ones matters: ensure a nesting and a good coordination of the scales from a global (e.g. international, national or sub national) level to a local level (and conversely). Each scale has its specific objectives. For instance, MSP at national scale gives strategic development while MSP at sub-national scale consider policy coordination and objectives (appropriated to the context). Therefore, the coordination takes into account the most appropriate scale to meet each objective: from strategic development to operational measures;
- Ensure that the broader scale gives information about larger phenomena and set complementary actions to the finer scale plans: n+1 scale should provide information to n scale (and conversely);
- Cross-border projects and a network of plans at a same scale (for instance at sub-national scale) should be favoured in view of the high mobility of resources and marine activities and the mismatch that could occur between ecosystems and legal frontiers;
- Take into account the facilitating factors of the implementation and management of the project. These maybe social opportunities or the availability of data, for example;
- Consider relevant scales at each stage of MSP processes development. Indeed, a different scale may sometimes be relevant for a particular step in the process of a MSP project. A particular reflection, for example, may be focused on the scale to which the mobilization of the stakeholders must be carried out;

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