Title - Benefits and impediments for the integrated and coordinated management of European seas

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ABSTRACT

New multi-sectoral policies with a regional implementation are developed when maritime states recognise the importance of managing the marine environment under an ecosystem-perspective rather than a use-perspective. In Europe, the Marine Strategy Framework Directive (MSFD) is the first attempt to promote an integrated management of the seas from the coastline to the limit of the Exclusive Economic Zone. This paper shows that, nine years from the MSFD adoption, there remain several ecological, economic, social and governance challenges. Using information gathered in a dedicated survey of the European Union Marine Strategy Coordination Group and in the recent literature the paper identifies the obstacles preventing a successful regional cooperation and policy integration. The survey indicates that the MSFD coordination structures are, in general, well-developed but there is an apparent lack of political will to coordinate actions at the regional level. Member States request greater flexibility to implement the Directive but they put their national interests before the benefit of a coherent and integrated approach for the entire region. Differences in budget, economic sector predominance, lack of staff and the MSFD short time-scale are identified as the factors that can hamper cooperation. These have produced recommendations of possible strategies for optimising regional coordination structures which respect the subsidiarity principle underpinning the MSFD.

Keywords: Regional Coordination, Policy Integration, Marine Strategy Framework Directive, Integrated Management, Marine Governance

1. INTRODUCTION

Maritime states are facing new challenges worldwide and adopting an integrated and coordinated marine management urgently requires marine legislation (Cruz and McLaughlin 2008). The United Nations Law of the Sea Convention Agenda 21 calls for "*new approaches to marine and coastal area management and development, at the national, sub-regional and global levels, approaches that are integrated in content and precautionary and anticipatory in ambit*"[1]. An integrated marine

[1] http://www.un.org/depts/los/consultative_process/documents/A21-Ch17.htm

28 governance approach has been adopted when coastal countries replaced sectoral policies with
29 new policies that regulate a wide range of socio-economic activities (Cruz and McLaughlin, 2008).
30 At the same time, transboundary management is more effective at the level of large marine
31 ecosystems and/or sea regions (Mee et al., 2008), resulting in several structures and platforms
32 being developed at the regional sea level. Regional marine management has existed since the
33 1970s, with the European Regional Seas Conventions (RSC) (the Barcelona, Bucharest, Helsinki and
34 Oslo and Paris Conventions) which clearly express the commitment and political will of
35 governments to tackle their common environmental issues through joint coordinated activities[2].
36 These RSC were designed initially to address mainly the impact of pollution but they did not
37 regulate fisheries (Mee et al., 2008) and shipping and only recently have they been extended to
38 include the protection of biodiversity. The same trend was observed in European Union (EU)
39 policies, which moved from a sectoral to a more holistic marine management approach (i.e.
40 managing the whole system rather than individual sectors such as shipping, energy, etc.); for
41 example, this change is reflected in adopting the Water Framework Directive and other
42 Framework Directives (Boyes and Elliott, 2014). The Clean Water and Oceans Acts in the US have
43 similar aims (Ocean Act, 2000).

44 Marine management has long accommodated a vertical hierarchy of governance from the local to
45 the global (Elliott, 2014; Boyes and Elliott, 2014) and ecosystem governance (regarded here as the
46 combination of policies, politics, administration and legislation) should be pluricentric where
47 arrangements are taken at local, national and supra-national levels (see Ostrom, 1998; Stoker,
48 1998; Hooghe and Marks, 2003; van Kersbergen and van Waarden, 2004), while characterized by
49 non-hierarchical methods of control (Olsson et al., 2007). There has been a mismatch between
50 ecological and management scales in the highly connected marine ecological components and
51 systems and addressing this mismatch requires similarly-connected governance. Some of the
52 consequences of this mismatch have led to the decline of fish stocks (Wilson, 2006), alteration of
53 food webs, biodiversity loss, increasing pollution (Maier, 2014) and, more generally, the loss of
54 future economic opportunities (Duda, 2004). For example, in Europe, the Common Fisheries Policy
55 provided strong institutional tools at the central EU level for fisheries management but this has
56 not led to sustainable fisheries exploitation (Hegland et al., 2012). At its last reform, the efficiency

[2] At the present, more than 143 countries participate in 13 Regional Seas programmes: Black Sea, Wider Caribbean, East Asian Seas, Eastern Africa, South Asian Seas, ROPME Sea Area, Mediterranean, North-East Pacific, Northwest Pacific, Red Sea and Gulf of Aden, South-East Pacific, Pacific, and Western Africa

57 and legitimacy of the Common Fisheries Policy aims to benefit from a regional implementation
58 where the decision-making process takes place at a level closer to the specific fisheries (Raakjaer
59 et al., 2012).

60 Achieving integrated management is not straightforward, since sectoral policies have a specific set
61 of governance arrangements, different economic strengths and political influence (Ounanian et al.,
62 2012; Van Tatenhove, 2013). Moreover, maritime activities occur at different spatial levels, from
63 fixed structures (e.g. oil and gas extraction) to temporary and mobile activities (e.g. fishing and
64 shipping) that occupy the three dimensional marine space (Van Tatenhove, 2011).

65 Despite these difficulties, successful policy integration and international cooperation brings many
66 benefits from ecological, political and socio-economic perspectives. For example, it is essential to
67 address and prevent the impact of diffuse pollution (e.g. caused by shipping), as well as to manage
68 many fish stocks whose distribution is larger than a single Exclusive Economic Zone (Freire-Gibb et
69 al., 2014). Economic benefits can be achieved with lower costs if cost-effectiveness is analysed
70 across countries (see e.g. Neumann and Schernewski, 2001) and management measures will be
71 more effective if and when coordinated across national borders (Hegland et al., 2012; Bertram et
72 al., 2013).

73 The political advantages of a coordinated implementation of environmental policies are related to
74 the effectiveness of the structures and networks that are used to overcome conflicts among
75 marine sectors as well as negotiate political decisions among governments. These structures are
76 more valuable if all the parties have the opportunities to discuss their positions from an early
77 stage (Maier, 2014) and throughout the whole implementation process (Berkes, 2009).

78 This paper identifies the obstacles to the effective coordination and integrated implementation of
79 marine policies which are essential to achieve the ecosystem management of maritime activities.
80 To do so, the implementation of the Marine Strategy Framework Directive (MSFD 2008/56/EC)
81 and its coordination structures at the European level are used as an example. In particular, the
82 analysis here investigates the effectiveness of existing coordination structures that support
83 countries in the implementation of the MSFD and evaluates whether it is possible to implement
84 the Directive in a coordinated way given the diversity in marine habitats as well as political and
85 socio-economic landscapes within the four regions identified in the Directive – the Baltic Sea, the
86 Black Sea, the Mediterranean Sea and the North-East Atlantic Ocean. Therefore, an on-line survey
87 was developed covering the basis of the main weaknesses identified by the European Commission

(CIS, 2013; EC Annex, 2014; EC, 2014; EEA, 2015) and RSC reports in relation to the implementation of the MSFD.

The MSFD is one of the directives approved in 2008 by European Member States in the context of the Integrated Maritime Policy[3] to foster collaboration between countries to improve the status of the marine environment by 2020. This framework was the result of an extensive consultation initiated in December 2002 with stakeholders and actors from EU and non-EU countries (Long, 2011; Markus et al., 2011), to identify best practices for marine management and exchange experiences. The results of the consultation were included by the Commission in the Proposal of the MSFD of the European Parliament and of the Council (COM (2005) 505 final). Some Member States were against the interference of the EU in marine affairs and many were concerned about a binding regional approach. Eventually, it was established that each country should define Good Environmental Status (GES) for their waters (Mee et al., 2008; Borja et al., 2013) and that such definitions will be assessed by the European Commission to ensure a coherent and coordinated regional implementation of the MSFD. The framework has been transposed into national legislation by specific marine strategies, whose preparation started with the assessment of the characteristics of marine waters (Article 8) including a detailed study of the main pressures and impacts and an economic and social analysis. On the basis of such an assessment, Member States defined what they considered GES of their marine waters (Article 9) and established a set of environmental targets to achieve it (Article 10). During the period 2015–2016, Member States developed and implemented Programmes of Measures to achieve GES (Article 13). These steps will be revised and repeated during the second 6-year cycle (starting in 2018) based on the previous experience gained.

2. METHODOLOGY

2.1 Survey of the Marine Strategy Coordination Group

The Marine Strategy Coordination Group (MSCG) was considered the most suitable group of experts to be surveyed as it is a platform of the Common Implementation Strategy where representatives of the Member States, stakeholders, international organisations, NGOs, European Commission (EC) and RSC gather to discuss their concerns, identify best practices and produce

[3] http://ec.europa.eu/maritimeaffairs/policy/index_en.htm

guidelines in support of a coherent implementation of the Directive (EC Annex, 2014). The MSCG is also responsible for coordinating and supervising other working groups engaged in data and information and knowledge exchange (WG DIKE), producing a regionally agreed set of common GES criteria, environmental targets and associated indicators (WG GES) and the cost-effectiveness of measures (WG ESA) (CIS, 2013).

The 52 participants of the MSCG that have attended the meetings at least once in the last 3 years were selected for the survey which was prepared using the Qualtrics Software[4] and e-mailed in April 2016. It consisted of seven questions, requiring the respondents to choose from single-choice, multiple-choice or by ranking the options provided (Table 1).

----------**Table 1 here**----------

The first part of the survey comprised three sections. In the first section, participants were asked to identify themselves as one of three categories: EC representative, Member State authority or Observer. These two last category representatives were further asked to indicate their location as the Black Sea, Mediterranean Sea, Baltic Sea or the North-East Atlantic Ocean. In the second section, respondents were asked to rank, in order of importance, the most effective coordination structure. The third section aimed at evaluating the feasibility of a coherent implementation of the MSFD at regional scale. The response options provided aimed at indicating the adequacy of the coordination structures and identifying the elements (ecological, socio-economic and governance) that could hamper the regional coherence during all the phases of implementation. Respondents were also asked to indicate other elements other than those considered in the survey and to elaborate their answers where possible.

The second part of the survey included three sections which focused on three specific aspects of the MSFD: the selection of common criteria and indicators, the identification of common lists of species/habitats, and the establishment of environmental targets at regional level (Table 1). Of particular importance was the section aimed at understanding why countries were not able or willing to establish coherent sets of targets within their regions. The questions were designed to assess the adequacy of the support provided by a specific type of coordination structure, namely the four RSC, and the feasibility to establish a coherent set of targets at a regional scale for all the

[4] Qualtrics: Online Survey Software & Insight Platform

eleven descriptors of the MSFD. In this case, respondents were allowed to choose more than one response option and to add any further elements.

In the last part of the survey, participants were asked to rank the most important actions required to achieve GES and how integration with other policies contributed to a more coherent implementation using the experience from other directives.

2.2 Statistical analysis

To determine whether the responses varied according to the three MSCG categories, the data were tested using Analysis of Similarity (ANOSIM), a non-parametric multivariate hypothesis testing method (Clarke, 1993). The tests were run separately for each question, under the null hypothesis of no significant differences among the participant categories. For the single/multiple choice questions, the options were coded as presence-absence (binary) variables, attributing the value 1 to the option chosen by the respondent and 0 to the other options. This yielded a presence-absence data matrix for each question with the response options representing the variables and the respondents representing the samples. The resemblance matrix among the respondents was determined per question and by calculating the Jaccard similarity coefficient (for binary responses).

For the rank questions, the resemblance among respondents was determined by calculating the Spearman rank correlation. All resemblance matrices were tested by one-way ANOSIM which produces the statistic R, which varies from -1 to +1 and is equal to +1 when all the respondents of the same category are more similar to each other than any of the respondents from different categories, and so rejecting the null hypothesis. R approaches zero when the null hypothesis cannot be rejected. The R statistic is accompanied by a significance value obtained by calculating the probability of the observed R within a series of simulated R values obtained by permutation (Clarke, 1993). ANOSIM was run using the software PRIMER v7 (Clarke and Gorley, 2015).

3. RESULTS

From the 52 invited participants of the Marine Strategy Coordination Group, 27 took part in the survey (a response level of 52%, Table 2). The ANOSIM test (Table 3) showed that the participant category had no influence in the responses provided in the survey. The results of the qualitative

responses (open answers/comments) also did not follow a clear pattern either within each of the three categories or within the regions.

----------**Table 2 here**----------

----------**Table 3 here** ----------

When the participants were asked to rank the four coordination structures according to their effectiveness, 60% placed the RSC first and the Common Implementation Strategy second (42%) (Figure 1). The RSC were considered the most effective structures to coordinate actions by those respondents from the North-East Atlantic and Baltic Sea regions (9 out of 15). Three observers (from the Baltic and Atlantic regions) and one EC representative commented that, when properly used, the existing coordination structures are adequate while two Member States (from the Mediterranean and Black sea regions) not unexpectedly pointed out that coordinating actions are more difficult in those marine regions where EU countries are the minority (8 out of 21 in the Mediterranean region and 2 out of 6 in the Black Sea). The non-EU countries usually have a less well-developed history and capability of marine environmental protection.

----------**Figure 1 here** ----------

The next question asked whether it was feasible to implement the MSFD in a coherent way within regions. Most of the respondents (41%) considered it valuable to establish a set of minimum requirements at regional level (e.g. the identification of criteria and indicators) and suggested that it would be helpful to have some guidance for some criteria but not for the indicators, given the differences among countries (Observer, Mediterranean Sea). Others considered it of value to establish minimum requirements but also that Member States should not be obliged to use criteria that may not be relevant for their territory, not sufficiently scientifically developed or for which there is no political support. In contrast, 19% said that even if countries were willing to be coordinated with each other, it would not be possible to achieve high levels of coherence. They argued that several elements can hamper regional coherence; for example, the MSFD timescale is too short, it requires long international negotiation and many staff. Others added that coherence depends on the different financial arrangements and resources in each country, given that they have to fund national implementation (North-East Atlantic Member State). Another 22% of the

207 respondents, all from the Baltic and the North-East Atlantic regions, considered that it is possible
208 to be coherent at a regional level when the current coordination structures are properly used.
209 Despite this, 18% indicated that the role of the coordination structures needs to be strengthened.

210 When asked to identify one or more reasons that led countries to establish sets of environmental
211 targets that were very different within their regions, most of the responses indicated that it was
212 not feasible to achieve high level of coherence for some descriptors (e.g. biodiversity) at such a
213 large scale (60%). For two Mediterranean Member States, expectations were not realistic since the
214 first phase of the implementation was based on existing data from other policies and that regional
215 coherence involves not only ecological but also socio-economic and political aspects which can be
216 fulfilled only over the long-term. The second most selected option (35%) suggested that the
217 Directive lacks a clear indication of to what extent countries included in the same region had to be
218 coherent while, according to 26% of the responses, the role of the RSC was not clear. The least
219 selected option (11%) indicated that it was due to the limited support from the RSC. One NGO
220 suggested that the role of the RSC was clear but countries chose not to see it that way, thus these
221 structures have not been used properly to coordinate actions. Another two participants
222 considered that there was lack of political will to cooperate among countries due to both the
223 stakeholder economic interests (NGO) and the fact that governments do not want to undertake
224 actions without securing complete control of their investments (EC). Another two observers (from
225 the Mediterranean Sea and the North-East Atlantic) emphasised that there was some guidance
226 and the guidance was sufficiently flexible for countries to define their GES, and to choose criteria
227 and indicators during the first round of the MSFD given the ecological differences within regions.
228 For another four respondents, coherence is necessary in the GES definitions but not for
229 establishing targets since "*the targets to achieve similar GES may vary between countries, because*
230 *the situation (the distance to achieve GES) can be different between them. However, they are*
231 *coherent because they are working for achieving the same GES*".

232 Those surveyed considered that sub-regions (52%) and regions (35%) were the most suitable
233 spatial scale at which to adopt common criteria and indicators. One observer, however, pointed
234 out that, given the multi-sectoral nature of the MSFD, the most appropriate spatial scale is a
235 mixture of regional and sub-regional scales depending on the issue; for example pollution and
236 habitat protection require such an approach.

With regard to the protection of biodiversity[5], 70% of the respondents agreed that there should be a common list of the most vulnerable species/habitats/communities within each region. Most of these respondents (19 out of 27) further suggested that such a list should include and go beyond the lists of other relevant pieces of legislation and agreements (such as the Habitats and Birds Directives and OSPAR) (Figure 2).

----------**Figure 2 here** ----------

The importance of integration with other environmental policies was confirmed when the participants were asked whether a complete integration between the MSFD and other relevant pieces of legislation could contribute to a coherent implementation of the Directive. All but one respondent marked policy integration as very important (67%) or important (30%).

In the last part of the survey, the participants ranked the actions that would contribute most to achieving the GES of European seas. More investments to reduce pressures on the marine environment and a better regional coordination were ranked first by 42% and 35% of them respectively, while policy integration was considered the second most important action (42%) (Figure 3)

----------**Figure 3 here** ----------

Some respondents emphasised that the political willingness of national governments is also essential to achieve GES. It is notable that a representative of the EC suggested that governments lack the political will to embrace the Ecosystem Approach to share resources and information, to promote joint monitoring and Programmes of Measures and to develop co-financed projects at supra-national level. Another respondent, rather surprisingly, suggested that the Member States see the MSFD as nature conservation legislation rather than a framework which aims to manage the whole marine environment in an integrated way and with a regional focus.

4. DISCUSSION

[5] Covered by three qualitative descriptors: Descriptor 1 Biodiversity; Descriptor 4 Elements of marine foodwebs (all elements at normal abundance and diversity) and Descriptor 6 Seafloor integrity (species, habitats and structures and functions are not adversely affected)

263 At its adoption in 2008, the Marine Strategy Framework Directive set a governance challenge of
264 historical importance for European environmental policy (van Leeuwen et al., 2014). It
265 represented the first attempt to implement ecosystem management at the level of European
266 regional seas (Ounanian et al., 2012; van Tatenhove, 2013) and the lessons learned during its
267 implementation process can be valuable in using the Ecosystem Approach for managing other
268 marine areas worldwide. This survey here identified the impediments to a coherent and
269 harmonious implementation of the MSFD at regional level and suggests possible solutions to
270 improve regional cooperation in its second cycle.

271 ***4.1 Effectiveness of MSFD coordination structures***

272 The results indicated that, when properly used, coordination structures are valuable platforms to
273 help countries to achieve high levels of coherence within regions; however, some of the
274 respondents considered that their role is limited and should be strengthened.

275 Among the four types of structures listed in the survey, RSC were ranked as the most effective way
276 to coordinate actions, followed by the Common Implementation Strategy. The MSFD defines
277 regional cooperation as "*cooperation and coordination of activities between Member States and,*
278 *whenever possible, third countries sharing the same marine region or sub-region, for the purpose*
279 *of developing and implementing marine strategies*". In the text of the Directive, the RSC are the
280 main platforms for coordination, although it makes a general reference to other existing
281 structures. The survey confirmed that some RSC (OSPAR and HELCOM) are more effective than
282 others. The differences in the support provided by each RSC to their contracting parties could be
283 due to either the fact that European Member States are in the minority in the Black Sea and the
284 Mediterranean Sea regional conventions or in the governance arrangements established within
285 each region to support the implementation of the MSFD. For example, for fisheries management,
286 HELCOM has created a better synergy between the HELCOM – FISH/ENV (Fish and Environment
287 Forum), the Common Fisheries Policy and International Council for the Exploration of the Seas
288 objectives and, for the shipping sector, with the IMO (Hassler, 2011; Raakjaer et al., 2014).
289 Furthermore, with the adoption of the North-East Atlantic Environmental Strategy, OSPAR
290 contracting parties have increased consistency between this and the MSFD objectives. Another
291 study (see ESaTDOR Annex 13, 2013) demonstrated that the role of the RSC structures is limited
292 when countries adopt and implement specific policy measures in support of ecosystem
293 management.

294 Since European Member States are also contracting parties to the RSC, achieving the Convention
295 objectives should benefit from a successful implementation of EU policies and vice versa. For
296 example, with the adoption of the MSFD, OSPAR assumed a prominent role as an executive
297 organisation and a regional forum to facilitate compliance (OSPAR, 2012). However, it does not
298 have the capacity to enforce its decisions since, being a convention by agreement, it opted for
299 non-binding recommendations and agreements and there are no sanctions other than the
300 criticism of fellow members. Unlike OSPAR, the EU can take actions via infraction proceedings for
301 infringement of its directives (ESaTDOR Annex 13, 2013). As an alternative, countries could take
302 action through their own legal instruments.

303 The Common Implementation Strategy structures were also considered to be valuable platforms
304 to exchange information and to enhance trust in the decision-making phase and the survey here
305 confirms their effectiveness as coordination structures, since they were ranked second. Even in
306 this case, more institutionalised procedures are needed to ensure lasting cooperation (Maier,
307 2014). Other fora, such as ICES, Baltfish (a BONUS ERAnet project) and the MedGovernance
308 Project, as well as trilateral and bilateral meetings, may be used to coordinate countries but,
309 according to Freire-Gibb et al. (2014), they could also increase institutional ambiguity.

310 Among the reasons for establishing different sets of targets within each region during the first
311 phase of the Directive, only 3 respondents admitted that the support received from such
312 structures was limited. This suggests that the MSFD coordination structures were not considered
313 as major impediments for a coherent implementation. In fact, respondents indicated that the lack
314 of any coherence was the result of other aspects, namely the will of national governments to
315 coordinate their actions, limited financial resources, a lack of dedicated funding, the MSFD short
316 time-scale and/or reduced staff. Freire-Gibb et al. (2014) identified further reasons at the basis of
317 the lack of cooperation among countries; these included changes in national governments,
318 disorganisation in institutional structures and research biases. The influence of the private sector
319 was also identified as one of the elements that can affect both Member State implementation
320 actions and the way they cooperate in the region (van Hoof et al., 2014). Raakjaer et al. (2014)
321 argue that regional cooperation is characterised by a "*highly fragmented governance system*"
322 emphasising a common lack of synergies between institutions (national, regional, European and
323 international) that should support European marine ecosystem management.

324 All the MSFD coordination structures are a combination of 'hard' and 'soft' modes of governance
325 (Simpson, 2013); 'soft' can be considered as including bridging organisations that provide an arena

for trust building, learning, enhancing cooperation and resolving conflicts, according to the definition of Hahn et al. (2006). Their non-legal binding nature aims to establish mutual understanding and move decision-making beyond self-interested intergovernmental bargaining (Raakjaer et al., 2014; Nilsson, 2013). For example, Skjærseth et al. (2006) show that measures aimed at reducing pollution under the International North Sea Conferences (INSC) are more easily adopted in soft law institutions which can influence the strength of the legally binding ones (the 'hard law') (EU) by exerting pressure on those reluctant to comply. They argue that binding rules need a much longer negotiation by those responsible for implementation since they often require monitoring and verification.

4.2 Spatial scale

Cruz and McLaughlin (2008) considered marine geographical regions the most proper spatial scale to implement marine environmental management. However, it is not clear how countries in the same region can establish environmental targets and define GES coherently, as required by the COM Decision 2017/848/EC (repealing COM Decision 2010/477/EC), when also taking into account the site-specific aspects of their marine ecosystems, climatic conditions, management priorities or socio-economic activities (Boyes et al., 2016).

As a framework, the MSFD calls for regional coordination while allowing Member States a certain degree of flexibility and freedom to implement the different phases (given that subsidiarity is a founding principle of the EU, i.e. the ability to take decisions at a local level). This flexibility has led Member States to define GES and to establish targets, criteria and indicators in very different ways within the regions and this survey identified some of the reasons behind such differences. Most of the responses indicated that it is not feasible to achieve high levels of coherence for some descriptors (e.g. biodiversity) at a regional scale. More than half of the responses indicated the sub-region as the most suitable spatial scale to adopt common criteria and indicators. Hence each of the phases and the eleven qualitative descriptors of the MSFD might require identifying a specific spatial scale that in some cases can be smaller than marine regions. However, achieving a proper international cooperation is difficult even at sub-regional level without a strong political commitment. For example, in the Dogger Bank area of the North Sea, countries have had great difficulties in agreeing a joint recommendation for fisheries management and wind farms and thus on habitat protection, leading to a stalling in coherence over the last four years[6]. Similar

[6] http://www.parliament.uk/business/committees/committees-a-z/lords-select/eu-environment-and-agriculture-sub-committee-d/news/lords-eu-d-regional-marine-cooperation-report/

356 conclusions were drawn regarding the Wadden Sea trilateral cooperation (Germany, Denmark and
357 the Netherlands) where countries did not follow a coordinated approach in relation to EU
358 legislation, fisheries, tourism, and shipping safety. This was attributed to the dominance of
359 commercial interests and the fact that the ministries responsible for these issues were not
360 represented in the trilateral cooperation while others argue that it was due to the non-binding
361 cooperation (ESaTDOR Annex 13, 2013)

362 Although countries are allowed a certain degree of freedom, hence the nature of a 'framework
363 directive', successful international cooperation and coherence among actions are necessary to
364 achieve similar levels of ambition and to have the ability to compare the results of the national
365 strategies. Most survey respondents seemed to recognise the importance of these two conditions
366 and agreed that minimum requirements should be established at a regional level to achieve higher
367 levels of coherence, although a wide range of requirements have been suggested (such as
368 minimum criteria, indicators, targets, GES definitions). The Organisation for Economic Cooperation
369 and Development (OECD, 2012) suggests that a comprehensive set of ambitious targets should be
370 established at the regional level to better enable the politicians and administrators to pursue a
371 coherent agenda. This led to the previous suggestion (Cavallo et al., 2016) that, when establishing
372 environmental targets in the context of the MSFD, Member States should evaluate whether such
373 targets are compatible with those identified by their neighbouring countries and with those
374 already established under existing national and international obligations; this approach would
375 avoid conflicts. Furthermore, Elliott et al. (2015) suggest that the GES definition and programmes
376 of measures need to be adaptive and flexible taking into account scientific development and
377 environmental changes, including climate change. Several other authors discuss the opportunities
378 offered by the adaptive co-management of natural resources (see Wollenberg et al., 2000; Gadgil
379 et al., 2000; Ruitenbeek and Cartier, 2001; Folke et al. 2003; Borrini-Feyerabend, 2004). This
380 approach combines dynamic learning (i.e. adaptive management) with collaborative management,
381 helping to negotiate conflicts among groups of stakeholders that differ in values, interests and
382 power (Dietz et al., 2003) and it fosters social coordination that leads to self-organisation (Olsson
383 et al., 2007).

384 The difficulties in establishing similar targets were also discussed by Dogterom (2001), who found
385 that many different targets were established by different countries and transboundary river
386 authorities for freshwater quality corresponding to UN/ECE Class 1 (sustaining the ecological

function). The author related this either to the degree of risk that each party is prepared to accept or to their interpretation of a 'normal ecological function'.

4.3 Priority actions to achieve the GES of European seas

Most respondents agreed that the most urgent action to achieve GES requires greater investment in measures aimed at reducing pressure (such as sustainable fisheries, reducing plastic and controlling nutrient emissions). They also recognised the importance of regional coordination and hence emphasise that the implementation of marine policies without a regional focus could lead to conflicts between countries. For example, the poor implementation by a Member State (or even a third country) may encourage others not to take ambitious measures since they might consider that their efforts could be undermined (Juda & Hennessey, 2001).

Another survey found that the interest of most EU private stakeholders goes beyond the national Exclusive Economic Zones (Freire-Gibbs et al., 2014) and for that reason they have a strong interest in regional cooperation and in participating in decision-making and implementation processes. Marine stakeholders also recognise that the problems emanating from too-localised policies and those *one-size-fits-all* approaches can cause the failure of ecosystem management (Ounanian et al., 2012; Raakjaer et al., 2014).

With regard to the importance of the integration between the MSFD and other related environmental policies, the respondents agreed that a better integration will improve coherence among national implementation strategies. Cavallo et al. (2016) present a list of the possible pieces of environmental legislation that can be integrated with the MSFD and conclude that when countries of the North-East Atlantic used data, approaches and targets from related legislation, the national strategies were more coherent among countries. For example, in this survey, the participants recognised that policy integration was especially important for the protection of biodiversity. They particularly agreed on the need for a common list of the most vulnerable species/habitats and communities within each region.

To date, it is difficult to evaluate the effects of integration among policies, or the lack of it, especially in quantitative terms, given the paucity of studies in this area (OECD, 2012). For this reason, it is necessary to have a clear understanding of the potential synergies between policies to avoid contrasting objectives and a waste of resources (Cavallo et al., 2016). Policy priority areas should be transparently monitored to identify any inconsistencies of approach and so lead to

417 additional arrangements; however, a complete integration among policies may not always be
418 feasible due to different national interests (OECD, 2012).

419 **5. Conclusions**

420 Coordination structures proved to be effective as fora to exchange information and identify best-
421 practice, and in turn enabled the parties to make large efforts to meet some of the principles at
422 the basis of ecosystem management. However, they are not sufficient to achieve a coherent
423 implementation of the MSFD without a stronger political commitment of all the parties to
424 collaborate. Moreover, it has been shown that national strategies will benefit from a better
425 integration of the work already carried out in the context of the RSC and in other European and
426 international legislation. In contrast, this study indicates that, in some cases, is not possible to be
427 coherent within regions at the detailed level required by the MSFD. This is especially so given that
428 a coordinated implementation of such a multi-sectoral Directive requires the significant
429 investment of time and financial resources by the countries involved, hence more flexibility and
430 freedom is needed to achieve its goals.

431 The concept of adaptive management introduced in the Directive could help countries to
432 overcome most of the uncertainties identified in this study related to a coordinated
433 implementation of this Directive. Defining GES and related targets could be refined with increasing
434 scientific knowledge, if they do not provide the expected improvement in the environment or if
435 they are in conflict with those established by other countries. Member States will be required to
436 expend greater effort to provide more coherent GES definitions with similar levels of ambition
437 across the European Union, otherwise the objective of ecosystem management at the basis of this
438 Directive is compromised. If the Member State is unwilling to achieve the required regional
439 implementation of the MSFD, the European Commission may have to be prepared to take a
440 stronger leading role (Freire-Gibb et al., 2014). Finally, it is emphasised that, from its adoption,
441 much progress has been made but a better use of the current coordination structures in the
442 decision-making phase could produce a more coherent implementation of this Directive during the
443 second cycle (starting in 2018).

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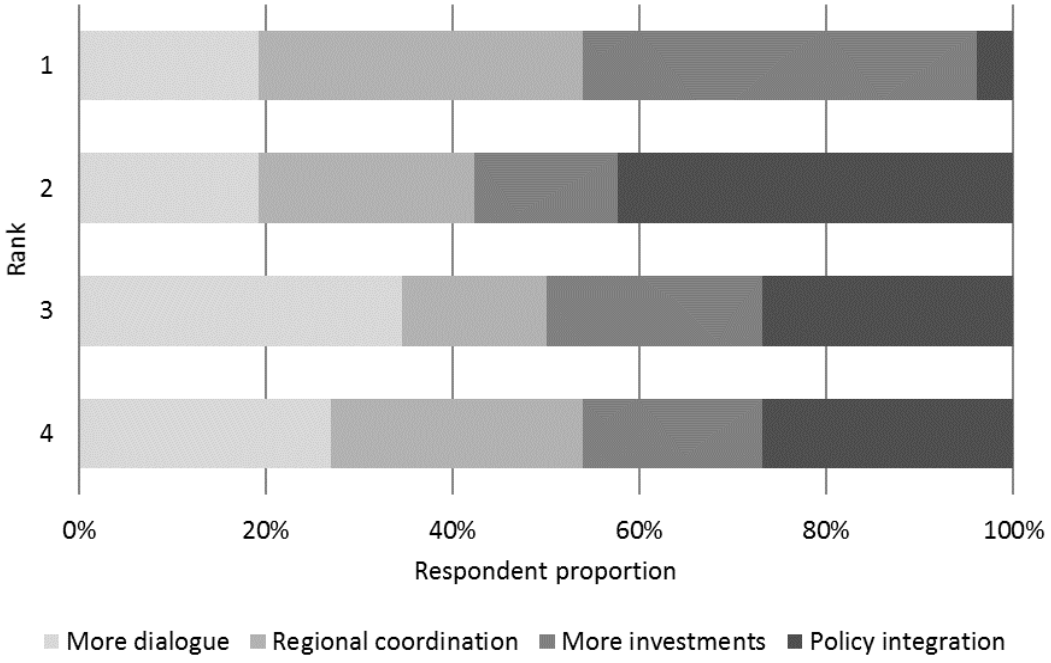
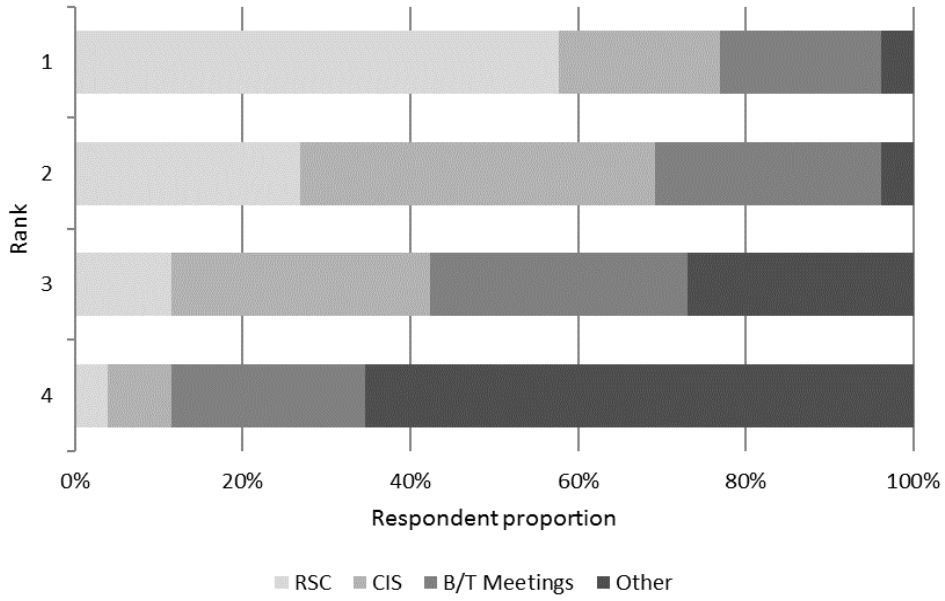

Rank
1
2
3
4
0%
20%
40%
60%
80%
100%
Respondent proportion
More dialogue
Regional coordination
More investments
Policy integration

Figure 1
Assignment proportions of the coordination structures according to their rank position attributed by the respondents.

Figure 2
Among the 19 respondents that agreed on the adoption of a common list of the most vulnerable species, habitats and ecosystems at regional level for biodiversity descriptors, some indicated one or more elements that should be considered in that list: be in line or go beyond the lists of other legislations (10 respondents) and/or include all migratory species (5 respondents) and functional groups (5). The category 'other' includes all top predators fish, mammals or indicated single species (ex. Harbour porpoise, some sharks).

Figure 3
Ranking of the most important actions towards GES of the European Seas


Rank
1
2
3
4
0%
20%
40%
60%
80%
100%
Respondent proportion
RSC
CIS
B/T Meetings
Other

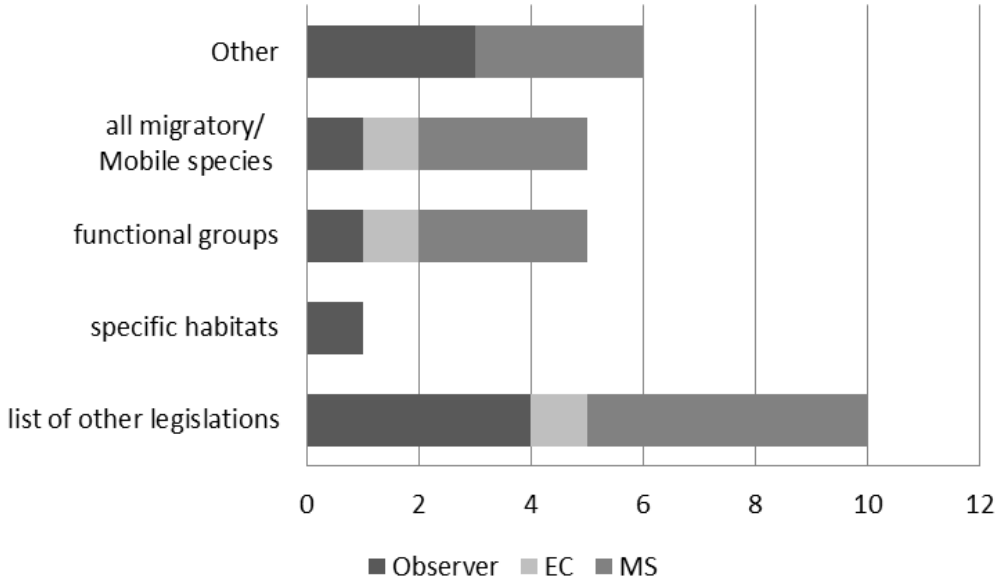

Other
all migratory/
Mobile species
functional groups
specific habitats
list of other legislations
0
2
4
6
8
10
12
Observer
EC
MS

Table 2
Marine Strategy Coordination Group categories and number of respondents.

Category	Number of participants		
	Personal opinion	Organisation's opinion	Subdivision per region
European Commission (Directorate-General, European Environmental Agency, Joint Research Centre, European Parliament)	4	0	-
Observer (RSC, International Organisations, Stakeholders, Consultants)	4	5	Mediterranean Sea 1 North-East Atlantic 2 Baltic 1 Black 0 All waters 5
Member States Authority	8	6	Mediterranean Sea 4 North-East Atlantic 5 Baltic Sea 4 Black Sea 1

Table 3

ANOSIM global test R values for the null hypothesis under study in the seven survey questions. All R values were found non-significant ($p > 0.05$ in all cases), meaning that the null hypothesis was never rejected.

Question	Q1	Q2	Q3	Q4	Q5	Q6	Q7
R-values	0.145	- 0.001	- 0.077	0.116	0.031	- 0.046	- 0.043

Table 1
Summary of the survey for the Marine Strategies Coordination Group.
Abbreviations: CIS: Common Implementation Strategy; RSC: Regional Seas Conventions; GES: Good Environmental Status

Question (Q)	Response options	Response type
Q1. Effectiveness coordination structures	CIS; RSC; Bilateral/Trilateral Meetings; others	Rank options (order of importance)
Q2. Feasibility to achieve high levels of regional coherence	It is possible using existent coordination structures; existing structures need to be strengthened; minimum requirements should be established; it is not possible	Single choice followed by an open-ended question
Q3. Identification of the suitable spatial scale for common criteria/ indicators	Regions; sub-regions; adjacent countries; national level	Single choice
Q4. Identification of reasons behind the establishment of different targets	Limited support from the RSC; the role of the RSC was not clear; too large spatial scale; lack of indications in the Directive.	Multiple-choice followed by an open-ended question
Q5. Selection of common lists of species/habitats/communities	Yes or no	Single choice followed by an open-ended question
Q6. Actions to achieve GES	More dialogue among all the parties; better coordination among countries; integration with other policies; more investments	Rank options (order of importance)
Q7. Importance of policy integration for a coherent implementation within regions	Very important; important; negligible.	Multiple-choice