The COMMON SENSE project has received funding from the European Union’s Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.
The work described in this report has been partially funded by the European Commission under the Seventh Framework Programme, Theme OCEANS 2013.2; Innovative multifunctional sensors for in-situ monitoring of marine environment and related maritime activities.

Acknowledgement
EXECUTIVE SUMMARY AND STRUCTURE OF THE DELIVERABLE

Deliverable 1.2 focuses on the national efforts to implement Marine Strategy Framework Directive (MSFD) in the Member States. This report’s detailed objectives include:

1. description and evaluation of the MSFD implementation process, including public involvement in this process;
2. analysis of the Member States Initial Assessments -- prepared within the scope of the MSFD -- their adequacy and comparability with MSFD stipulations;
3. description and evaluation of existing environmental monitoring programmes set up to meet MSFD requirements;
4. identification of non-adequate monitoring efforts, existing monitoring gaps and emerging monitoring needs.

The evaluation within deliverable 1.2 concentrates on indicators and monitoring efforts concerning four selected good environmental status (GES) descriptors: D5 (eutrophication); D8 (contamination); D10 (marine litter); and, D11 (underwater noise). For these descriptors, new sensors will be designed and tested in the further phases of the Common Sense project. This report provides background information and an up-to-date status assessment to sensors developers, in order to empower and facilitate their work on sensor design undertaken in WP5, WP6, WP7 and WP8.

In more general terms, this report also identifies problems and challenges related to the overall implementation of the MSFD, and addresses the diverse realities of its implementation.

Deliverable 1.2 consists of two main parts. In the first part (chapter 4), we summarize the results of the European Union technical assessment of the Common Sense descriptors in Member States’ Initial Assessments. The second part (chapters 5-7) consists of three case studies: Ireland; Poland; and, Spain. These case studies were selected to represent three EU Regional Seas: North Atlantic; the Baltic Sea; and, the Mediterranean Sea. These case studies provide more detailed insights on marine monitoring and regional cooperation assessed from the national perspective. An extensive summary of findings is provided in section 3.
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**LIST OF ABBREVIATIONS USED IN THE REPORT**

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<td>AAS</td>
<td>atomic absorption spectrometry</td>
</tr>
<tr>
<td>AFS</td>
<td>atomic fluorescence spectrometry</td>
</tr>
<tr>
<td>AGRI/ENV FORUM</td>
<td>HELCOM Agriculture and Environment Forum</td>
</tr>
<tr>
<td>BSAP</td>
<td>Baltic Sea Action Plan</td>
</tr>
<tr>
<td>CLOR</td>
<td>Central Laboratory for Radiological Protection (<em>Centralne Laboratorium Ochrony Radiologicznej</em>)</td>
</tr>
<tr>
<td>DDT</td>
<td>dichlorodiphenyltrichloroethane</td>
</tr>
<tr>
<td>DIN</td>
<td>dissolved inorganic nitrogen</td>
</tr>
<tr>
<td>DIP</td>
<td>dissolved inorganic phosphorus</td>
</tr>
<tr>
<td>EEA</td>
<td>European Environmental Agency</td>
</tr>
<tr>
<td>EMEP</td>
<td>European Monitoring and Evaluation Programme</td>
</tr>
<tr>
<td>FAAS</td>
<td>flame atomic absorption spectrometry</td>
</tr>
<tr>
<td>FISH/ENV FORUM</td>
<td>HELCOM Fisheries and Environment Forum</td>
</tr>
<tr>
<td>GC</td>
<td>gas chromatography</td>
</tr>
<tr>
<td>GC-MS–</td>
<td>gas chromatography with mass spectrometry</td>
</tr>
<tr>
<td>GEAR</td>
<td>HELCOM Group for Implementation of the Ecosystem Approach</td>
</tr>
<tr>
<td>GES</td>
<td>Good Environmental Status</td>
</tr>
<tr>
<td>GIOS</td>
<td>Chief Inspectorate of Environmental Protection in Poland (<em>Główny Inspektorat Ochrony Środowiska</em>)</td>
</tr>
<tr>
<td>HABITAT</td>
<td>HELCOM Nature Protection and Biodiversity Group</td>
</tr>
<tr>
<td>HBCDD</td>
<td>hexabromocyclododecane</td>
</tr>
<tr>
<td>HCB</td>
<td>hexachlorobenzene</td>
</tr>
<tr>
<td>HCH</td>
<td>hexachlorocyclohexane</td>
</tr>
<tr>
<td>HEAT</td>
<td>HELCOM Eutrophication Assessment Tool</td>
</tr>
<tr>
<td>HELCOM</td>
<td>Baltic Marine Environment Protection Commission</td>
</tr>
<tr>
<td>HELCOM COHIBA</td>
<td>HELCOM project concerning control of hazardous substances in the Baltic Sea region</td>
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<tr>
<td>HELCOM COMBINE</td>
<td>HELCOM programme concerning monitoring in the Baltic Marine Environment</td>
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<tr>
<td>HELCOM CORESET</td>
<td>HELCOM project concerning core set indicators for Baltic marine environment</td>
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<td>HELCOM HOLAS</td>
<td>HELCOM project concerning holistic assessment of Ecosystem Health of the Baltic Sea</td>
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<tr>
<td>HELCOM MORE</td>
<td>HELCOM project concerning revision of the HELCOM monitoring programmes</td>
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<td>HELCOM MUNI</td>
<td>Dumped Chemical Munitions in the Baltic Sea Group – HELCOM Expert Group</td>
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<td>HELCOM PLC</td>
<td>HELCOM project concerning pollution load compilation</td>
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HELCOM-VASAB MSP WG HELCOM Maritime Spatial Planning Working Group
HPLC high performance liquid chromatography
HPLC-F high performance liquid chromatography with fluorescence detector
HRGC-HRMS gas chromatography with mass spectrometry
HS hazardous substances
IA Initial Assessment
ICES International Council for the Exploration of the Sea
ICP-MS Inductively coupled plasma mass spectrometry
ICP-OES inductively coupled plasma optical emission spectrometry
IM Maritime Institute in Gdansk (Instytut Morski w Gdansku)
IMGW-PIB Institute of Meteorology and Water Management – National Research Institute in Poland (Instytut Meteorologii i Gospodarki Morskiej - Państwowy Instytut Badawczy)
IO PAN Institute of Oceanology, Polish Academy of Sciences (Instytut Oceanologii Polskiej Akademii Nauk)
IUPAC International Union of Pure and Applied Chemistry
JRC Joint Research Centre
LAND HELCOM Land-based Pollution Group
LC-MS liquid chromatography with mass spectrometry
MARITIME HELCOM Maritime Group
MARLISCO MARine Litter in European Seas: Social AwareneS and CO-Responsibility (7th Research Framework Programme)
MEDPOL Mediterranean Pollution Monitoring and Research Programme
MIR-PIB National Marine Fisheries Research Institute in Poland (Morski Instytut Rybacki - Państwowy Instytut Badawczy)
MONAS HELCOM Monitoring and Assessment Group
MS Member State
NP nonylphenol
NPE nonylphenol ethoxylates
OSPAR Commission for the Protection of the Marine Environment of the North-East Atlantic
PAHs polycyclic aromatic hydrocarbons
PBDEs polybrominated diphenyl ethers
PCBs polychlorinated biphenyls
PFOS perfluorooctane sulphonate
PMA  Polish Marine Areas
PMŚ  Polish State Environmental Monitoring (*Państwowy Monitoring Środowiska*)
RESPONSE  HELCOM Response Group
RP HPLC  reversed-phase high performance liquid chromatography
SCCP  short-chain chlorinated paraffins
subGES  Good Environmental Status not achieved
TBT  tributyltin compounds
TN  total nitrogen
TP  total phosphorus
TSG-ML  Technical Subgroup on Marine Litter
UPLC  ultra performance liquid chromatography
WFD  Water Framework Directive
WG DIKE  working group on data, information and knowledge exchange organized by European Commission in framework of MSFD Common Implementation Strategy and Joint Research Centre
WIOŚ  Voivodship Inspectorate of Environmental Protection (*Wojewódzki Inspektorat Ochrony Środowiska*)
WWF  World Wide Fund for Nature
1 INTRODUCTION

In 2008 the European Union adopted the Marine Strategy Framework Directive (MSFD) with its overall aim to (i) promote sustainable use of the seas, and (ii) conserve marine ecosystems (Preamble (4))\(^1\). This directive is believed to be an important shift in EU attitudes towards marine conservation and sustainable use of natural resources\(^2\). It is a shift from soft to hard sustainability. Its importance is even clearer if the MSFD is considered against the backdrop of the wide policy landscape and other European environmental legislation (such as the Birds and the Habitats Directives, Water Framework Directive, Common Agricultural Policy and Common Fisheries Policy)\(^3\).

Implementation of the MSFD is designed as a multistep process, and the ultimate goal of this process is to develop a programme of measures designed to achieve or to maintain good environment status (GES) of European marine areas by 2015 (Article 5(2b))\(^4\). In order to develop this programme of measures the Member States are obliged to prepare:

1. an Initial Assessment of the current environmental status of marine waters and the environmental impact of human activities on these waters (by July 2012);
2. a description of GES (by July 2012);
3. a set of environmental targets and related indicators (by July 2012);
4. a monitoring programme (by July 2014; Article 5(2a))\(^5\).

The objectives of MSFD are well grounded in scientific knowledge, the directive incorporates the concept of the ecosystem approach, and adopts a holistic rather than sectoral view on marine governance\(^6\). The directive does not, however, establish specific common objectives, but the responsibility to define these specific objectives is delegated to Member States. Member States are obliged to define a set of environmental targets to determine GES, and to design and implement a programme of measures. This definition is being negotiated at the national level by the Member States. Nevertheless, regional cooperation and multi-level governance structures are recognized as being an important part of the MSFD implementation.

\(^5\)Ibidem.
Regional Seas Convention are important tools, through which MSFD is being operationalized, and brought into policy and managerial practice\(^7\).

The EU reserved the right to coordinate and supervise the MSFD implementation. It supports the process through the definition of common methodological standards and criteria for the MSFD-related assessments and monitoring programmes. The EU also reserves also the right to assess if Member States’ actions meet the requirements set by the directive, and whether these actions are coherent across all European marine areas\(^8\).

According to the implementation schedule put forward by the MSFD, by July 2012 Member States should:

1. transpose the directive into their legal systems;
2. designate competent authorities to implement the stipulations of the directive;
3. prepare the Initial Assessment;
4. determine GES, environmental targets and indicators.

The Marine Strategy Framework Scoreboard\(^9\) reports that all countries, apart from Poland and Portugal, complied with the above requirements. However, the Scoreboard provides only basic information and does not assess the quality of the process and the documents provided. It intends to provide general information to the interested representatives of the public. In addition, Member States are still in the initial phases of the MSFD implementation, and only limited information on monitoring activities is available.

The scope of this report is to perform an in-depth analysis of the implementation of MSFD from the perspective of Common Sense project-related descriptors, and through three case studies that represent the European Regional Seas’ perspective.

In this report, we first assess the current situation for the four descriptors, for which new generation sensors will be designed, developed and tested in the Common Sense project. These sensors aim to improve the measurements of:

1. nutrient analytes, by utilising well-established colorimetric chemistries for phosphate, ammonia, nitrate and nitrite (= **MSFD D5** – “\(\text{Human-induced eutrophication is minimised, especially adverse effects thereof, such as losses in biodiversity, ecosystem degradation, harmful algae blooms and oxygen deficiency in bottom waters}\)’’;

---


2. low concentrations of heavy metals: Pb, Hg Cd, Zn and Cu (= MSFD D8 – “Concentrations of contaminants are at levels not giving rise to pollution effects”);  
3. surface concentration of microplastics (= MSFD D10 – “Properties and quantities of marine litter do not cause harm to the coastal and marine environment”);  
4. underwater noise by means of a bespoke acoustic sensor pod (MSFD D11 – “Introduction of energy, including underwater noise, is at levels that do not adversely affect the marine environment”).

Through the use of case studies, we were able to capture more general aspects of the MSFD implementation, including marine and environmental governance, and the directive’s existing and potential interactions with other policies and strategies. These case studies were chosen to represent three EU regional seas (the Baltic Sea, the Mediterranean Sea and the Atlantic Ocean) and differences in country size, population, economic development, living standards, and governance capacity. The characteristics of Common Sense case studies can be found in Table 1.

Table 1. Characteristics of Common Sense case studies  

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<th>Ireland</th>
<th>Poland</th>
<th>Spain</th>
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<tr>
<td>Area (land square km)</td>
<td>68,883</td>
<td>304,255</td>
<td>498,980</td>
</tr>
<tr>
<td>Coastline (km)</td>
<td>1,448</td>
<td>440</td>
<td>4,964</td>
</tr>
<tr>
<td>Population (July 2014)</td>
<td>4,832,765</td>
<td>38,346,279</td>
<td>47,737,941</td>
</tr>
<tr>
<td>GDP per capita (in 2013 USD)</td>
<td>41,300</td>
<td>21,100</td>
<td>30,100</td>
</tr>
<tr>
<td>Public debt (% of GDP; 2013)</td>
<td>124.2</td>
<td>48.2</td>
<td>93.7</td>
</tr>
<tr>
<td>Unemployment rate (%; 2013)</td>
<td>13.5</td>
<td>10.3</td>
<td>26.3</td>
</tr>
<tr>
<td>Population below poverty line (%)</td>
<td>5.5a</td>
<td>10.6b</td>
<td>21.1c</td>
</tr>
<tr>
<td>Human development index (2013)</td>
<td>0.899</td>
<td>0.834</td>
<td>0.869</td>
</tr>
<tr>
<td>Voice and accountability (2013)</td>
<td>1.31</td>
<td>0.97</td>
<td>0.97</td>
</tr>
<tr>
<td>Political stability and absence of violence and terrorism (2013)</td>
<td>0.88</td>
<td>0.95</td>
<td>0.01</td>
</tr>
<tr>
<td>Governance effectiveness (2013)</td>
<td>1.46</td>
<td>0.71</td>
<td>1.15</td>
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<tr>
<td>Regulatory quality (2013)</td>
<td>1.58</td>
<td>1.05</td>
<td>0.93</td>
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Researchers involved in the Common Sense case studies used a variety of social science methods. These methods included background literature review, review of legal acts and national strategies, semi-structure interviews, and experts opinions, including their own opinions. Purposive sampling was used to deepen the understanding of stakeholders’ views and values concerning the MSFD implementation process.

We summarize in chapter 4 the progress in MSFD implementation with regard to Common Sense descriptors in 19 EU Member States. This summary was prepared using the report prepared by the external consultants chosen by the European Commission to evaluate Initial Assessments submitted by these States before this report was commissioned.

Chapters 5-7 (Ireland, Poland and Spain) describe the findings in each case study. These chapters embrace five major review questions: (i) general description of MSFD implementation process in Ireland, Poland and Spain; (ii) results of the Initial Assessments (concerning the Common Sense descriptors); (iii) description of the social and economic elements of the MSFD implementation, including the characteristics of marine sectors and involvement of stakeholders in the process; (iv) external evaluation of MSFD and its operationalization (through the semi-structure interviews and the EC technical assessment); and (v) characteristics of the draft monitoring programmes (concerning the Common Sense descriptors).

The results of D1.2, together with information gathered in D1.1, will provide the developers of the sensors with the up-to-date information on the steps and progress that have been achieved in MSFD implementation. This report provides detailed information on current marine monitoring related to eutrophication, marine litter, contaminates and underwater noise. Existing gaps and emerging monitoring needs are identified, and will be serve as a basis for the work to be undertaken in the Common Sense Work Packages.

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10 D1.1 Review on the available methodological standards and gaps to be covered in order to meet the MSFD requirements: Analysis of the methodological standards included in European and International conventions in line with the MSFD descriptors’ requirements and good/bad practices and experiences of the established methodologies in terms of monitoring criteria and methodological standards
2 METHODOLOGY

A review of the current and future monitoring efforts related to eutrophication, marine litter, contaminants and noise was carried out in three selected case studies (Ireland, Poland and Spain). This analysis considered also the summary of technical assessment in 19 Member States subcontracted to the external consultant company by the European Union.

Deliverable 1.2 is a desktop review exercise. A Rapid Evidence Assessment (REA) principles were used to guide the evaluation process, and the evaluation protocol (Annex I) was prepared. The protocol was developed in cooperation with partners involved in Common Sense case studies, but the case study researchers were flexible to adjust or to revise the protocol. This flexibility was needed to adjust the report to case study context and information available.

Our analysis included the review of background literature, legal acts, national strategies and policies, project-relevant web sites, minutes and reports from working groups, public meetings, public hearings or public consultations. Because of the scope of the analysis, the main focus was put on policy documents, and the scientific literature came second.

Literature review was complemented with personal communications with experts both from inside and outside the Common Sense consortium. Informal communication (mostly between the members of the consortium) was performed to clarify or supplement the collected information. Formal communication – semi-structured interviews – was guided by a set of questions (Annex II) built around barriers and challenges to effective implementation of the MSFD and marine monitoring. Purposive sampling was used to select stakeholders for semi-structured interviews.
3 SUMMARY AND CONCLUSIONS

NATIONAL IMPLEMENTATION IN MEMBER STATES

All Member States has transposed the MSFD into their National legislation, including Poland (early 2013). By November 2013, thirteen conformity studies had been undertaken (for BE, BG, DK, ES, IT, LV, LT, NL, PL, PT, RO, SI, SE, and UK)\(^{11}\) and the remaining countries are underway. Landlocked Member States (i.e., AT, CZ, HU, LU and SK) do not have this responsibility.

According to articles 9(2) and 10(2) of the MSFD, MS were required to send notifications to the Commission by 15th October 2012 on the requirements included in the Articles 8, 9 and 10 of the directive: (1) an analysis of the essential features and characteristics, (2) an analysis of the predominant pressures and impacts, (3) an economic and social analysis, (4) GES definitions are presented in another additional document for each descriptor and (5) Establishment of environmental targets and indicators.

The National competent authorities are responsible for the implementation of the MSFD at national level as well as reporting and communication with the EC. With this aim in view, the Commission developed and provided MS with reporting sheets, tools and guidance by July 2012.

On 2nd February 2014 the EC has published a report on assessment and guidance of the first implementation phase of MSFD. The extent of the assessments undertaken by the different MS for the mentioned report and outstanding gaps are the following:

1. Full assessment (i.e. of all three articles and for all marine waters of the MS): BE, CY, DE, EE, EL, ES, FI, FR, IE, IT, LT, LV, NL, RO, SE and SI.
2. Partial assessment (i.e. not addressing all articles or all marine waters): BG (for art. 9 and 10), PT (all waters except Azores and Madeira) and UK (all waters except Gibraltar).
3. To be assessed (reports arrived too late for their inclusion: BG (for art. 8), HR, MT and UK (Gibraltar).
4. To be assessed (reports not yet received): PL and PT (for Azores and Madeira).

The technical assessment was carried out by external consultants that provided the Commission with all the information and background in order to carry out any follow-up actions and communication with the Member States and to develop an integrated assessment and guidance of the first phase of the implementation of the MSFD.

The adequacy level of the overall assessment, it was assessed as being moderate to low since even those MS with higher scores have had shortcomings. UK and ES (North East Atlantic and

\(^{11}\) Please see Annex III for MS abbreviations.
Mediterranean) were scored 70% and 60% respectively having the maximum adequacy score. All other MS were below 55% being 9% the lowest score (RO), see the graphic below. The North East Atlantic region MS showed the highest level of coherence followed by the Baltic and the Mediterranean.

Figure 1. Summary of the overall adequacy scores per Member State across MSFD articles 8, 9 and 10. The scores are expressed as a percentage of the total possible score, with MS grouped per marine region (hence SE, DK, DE, FR and ES appear twice)\(^\text{12}\)

The implementation of the first phase of the MSFD was very challenging since many new elements and ambitions were introduced in the Directive and applied for the first time. Several gaps were identified and recognised:

1. “Most of the results were built on work/data which pre-dated the MSFD (2010) and few new data and assessments were used.
2. Most of the regional assessment work, on which MS must rely upon, was only partially updated or not at all since the MSFD entered into effect, because the timelines for these assessments had not (yet) been aligned with the MSFD deadlines.


The COMMON SENSE project has received funding from the European Union’s Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.
3. There was also a lot of work in progress (and not finalised in time) to address shortcomings already identified.

4. Some identified deficiencies led to subsequent actions, e.g. at regional level, because some joint assessments of Member States already indicated that more work would be necessary.

5. The process was not helped by delays in finalising the reporting templates, guidance and technical infrastructure, which themselves depended upon adoption of the GES Decision in 2010 and development of common understandings on GES under the MSFD CIS process.

6. The Commission recognises that all these aspects contributed to some of the lack of clarity and possible inconsistency in the Member States’ reports”.

IRISH CASE STUDY

The MSFD was transposed into Irish law through the European Communities (Marine Strategy Framework) Regulations 2011 on May 31, 2011. For the purposes of reporting on MSFD Articles 8, 9 and 10 Ireland has defined a single assessment area, covering their entire marine waters. The relevant government authority (or ‘Competent Authority’) in Ireland tasked with fulfilling a statutory remit as set out in the Directive is the Department of the Environment, Community and Local Government (DECLG). A national Technical Working Group on the Marine Strategy Framework Directive (MSFD-TWG) has been established by the Department of the Environment, Community and Local Government to support delivery of the MSFD. The members of the MSFD-TWG include representatives from the: Department of Environment Community and Local Government; Department of Energy Communications and Natural Resources; Department of Arts Heritage and the Gaeltacht; Department of Transport Tourism and Sport; Department of Agriculture Food and the Marine, Environmental Protection Agency; Marine Institute; Irish Coastguard; Sustainable Energy Authority of Ireland; and, members of the MSFD Project Team.

Ireland has an extensive marine domain relative to its land mass, so the implementation of the MSFD will present new operational challenges with respect to marine monitoring, assessment and environmental protection. Implementation of the MSFD in Ireland incurred a delayed start, for example, the Initial Assessment report submitted by Ireland as a requirement of Article 8 of the Directive was delivered six months after the established deadline. In addition, public consultation for the preliminary stages of implementation was not extensive, possibly due to pressures arising from the delayed delivery of the Initial Assessment report; therefore, the option to incorporate the viewpoints of a broad range of stakeholders was limited.

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13 Ibidem.
marine stakeholders regarding the challenges and opportunities presented by the MSFD was not fully realised.

Appraisal of the Initial Assessment report submitted by Ireland revealed a number of challenges with respect to definition of GES and associated monitoring activities. Notably, no new assessment was undertaken specifically for the purposes of MSFD implementation, and although data and knowledge gaps are flagged, in the main no mitigating actions were proposed to address these issues. Furthermore, the Initial Assessment was considered to contain limited assessment of impacts from pressures, particularly in a quantitative manner, and few conclusive judgments on current status of marine waters. Conversely, these shortcomings may also provide an opportunity for new and innovative means to better understand the properties of Ireland’s marine waters, particularly with respect to the requirements of MSFD implementation and achievement of GES by 2020.

In terms of evaluation of progress, all Common Sense Descriptors with respect to the Determination of GES (Article 9) were assessed as being partially adequate, meaning they either do not fully address the Decision criteria or they lack key elements or specificity. However, with respect to Environmental Targets (Article 10), those for Descriptor 5 were assessed as adequate, while the targets for Descriptors 8 were assessed as being partially adequate since they lacked specificity or coverage and are thus not fully quantifiable, the targets for Descriptor 11 were absent and therefore evaluated as being inadequate.

To date, reporting for the purposes of Initial Assessment, Definition of GES and Environmental Targets have yielded a number of gaps and requirements with respect to the MSFD Descriptors addressed by Common Sense. Furthermore, in certain cases, current monitoring efforts are unlikely to satisfy the requirements for effective implementation of the MSFD in Ireland’s marine domain; therefore, providing an opportunity for novel techniques and new approaches.

1. For Descriptor 5, Ireland is collating data for nearly all MSFD GES indicators; however, no information is available concerning GES indicator 5.3.1 (Abundance of perennial seaweeds and seagrasses), and five of the eight relevant GES indicators are monitored solely in estuarine and coastal waters under the EPA WFD monitoring programme but not in Irish offshore waters.

2. For Descriptor 8, a gap exists due to the fact that GES indicator 8.1.1 is not monitored in Ireland. With respect to this Descriptor there is scope for Member States in the North East Atlantic region, such as Ireland, to further their monitoring efforts by either expanding current programmes or incorporate OSPAR procedures in a more comprehensive manner.
3. For Descriptor 10, with the exception of GES indicator 10.1.1 beach litter trends, Marine Litter is not monitored in Ireland. Current efforts in this regard are largely dependent on the activities of volunteers and NGO groups – while the various programmes centred around coastal / beach litter provide good geographical coverage and generate extensive data, at present it is not abundantly clear how the information from these various activities are collated and shared. With regard to targets, the Government have stated they will not commit to a quantitative reduction in marine litter targets until further information is gathered on pathways and possible controls over them.

4. For Descriptor 11, there is no dedicated monitoring programme in place in relation to GES indicators; however, a range of research initiatives have been undertaken, or are currently underway, with the aim to establish a starting point and baseline in order to facilitate establishment of suitable monitoring programme.

POLISH CASE STUDY

The MSFD was transposed into Polish law through the Water Act. This legal act regulates ownership, control, use, and protection of the Polish water resources. The act transposes not only the MSFD, but also the Water Framework Directive and the Floods Directive. Two governmental agencies, Chief Inspectorate of Environmental Protection, and National Water Management Authority, are now responsible for the implementation of the MSFD. Both institutions are subordinated to the Ministry of the Environment.

PMA are relatively small when compared with the total area of Poland, and the Polish central administration often fails to acknowledge that they are part of the national territory. Marine issues, including both the maritime economy and protection of the marine environment, do not have high priority. This might one of the reasons for the delay in the implementation of the MSFD, and the failure to submit the Initial Assessment to the EU thus far.

Despite these delays are failures, the implementation process has not been neglected. Draft documents (Initial Assessment, description of GES and draft monitoring programme) are available on the website of the Ministry of the Environment, even though they have not, as was already mentioned, officially submitted yet to the EU. All three documents were consulted with the stakeholders and the general public. But these public consultations were not extensive. This is reflected by the fact that only small number of institutions submitted their remarks and that there was no public hearings. However, the Chief Inspectorate of Environment Protection incorporated many of the submitted remarks into the final version of the documents, and provided extensive comments to many other.
Other drawbacks of the MSFD implementation includes a lack of formal involvement of maritime administration in the process. Maritime administration is responsible for the management of all marine areas in Poland and will be very likely the institution held accountable for implementing ‘National protection programme for marine waters’ into managerial practices. This lack of proper coordination among institutions is not exceptional, as it affects also, for example, the management plans for NATURA 2000 areas which are partly at sea, and marine spatial planning.

Poland is a member of HELCOM\(^\text{14}\) (Baltic Marine Environment Protection Commission, also known as Helsinki Commission). The Commission is an intergovernmental organization governing the Convention on the Protection of the Marine Environment of the Baltic Sea Area (Helsinki Convention). HELCOM has 10 Contracting Parties, which representatives meet annually.

HELCOM also functions as a coordination platform for the implementation of the MSFD in the Baltic Sea region and cooperates closely with the OSPAR Commission which mission is to protect the marine environment of the North-East Atlantic. The objective of the MSFD to reach GES of the marine waters by 2020 through marine strategies which apply the ecosystem-based approach is in line with the objectives and approaches both by HELCOM and OSPAR.

The following are the main findings concerning the monitoring programs of Poland marine waters regarding the indicators covered by the COMMON SENSE project:

1. **D5 (Eutrophication):**

   Results of the HELCOM projects and working groups, e.g.: COMBINE, PLC, EMEP, HOLAS, MONAS, have been implemented in Polish monitoring programmes and used for preparation of Initial Assessment and GES characteristics.

   **Gaps:** There is lack of nutrient winter concentrations monitoring, bad coverage of monitoring stations.

   **To be introduced:** monitoring of nutrient concentrations and their ratios, chlorophyll-a concentrations, transparency and oxygen concentrations will be extended to Slupsk Furrow. Additional stations will be monitored in Gdansk and Bornholm Basin. Data on nutrient loads from rivers and atmosphere will be provided by HELCOM PLC (Pollution Load Compilation) and HELCOM - EMEP (European Monitoring and Evaluation Programme) in the framework of PMŚ.

\(^{14}\) [http://helcom.fi](http://helcom.fi)
2. **D8 (Contaminants and pollution effects):**

   The proposed monitoring programme for contaminants and pollution effects is consistent with MSFD requirements. The proposed indicators for D8 were selected basing on initial assessment of marine waters, results obtained by HELCOM CORESET HS (expert group on hazardous substances) and HELCOM COMBINE guidelines.

   There were implemented: reduction and prevention of emissions of dioxins and other hazardous substances from small-scale combustion, (ii) implementation of HELCOM requirements concerning proper handling of waste/landfilling, (iii) promotion of the Strategic Approach on International Chemicals Management and participation in the regional implementation process, (iv) application of restrictions on the use of specific substances (PFOS, NP/NPE, SCCP), (v) assessment of the possibility and introduction of restrictions for cadmium content in mineral fertilizers, (vi) application of strict restrictions on the use of mercury in products and processes.

3. **D10 (Marine litter):**

   Marine litter is currently not included in the framework of State Environmental Monitoring.

   However, results of the projects/programmes/working groups, e.g.: HELCOM MORE, MEDPOL, MSFD GES TSG-ML, have been used for preparation of Initial Assessment and GES characteristics. An agreement among the HELCOM countries was reached to raise awareness of the negative environmental and economic effects of marine litter in the marine environment, including effects of “ghost fishing” of lost or discarded fishing gear.

   Plans for enhanced monitoring: litter washed ashore and/or deposited on coastlines should be carried out with frequency of four surveys per year; Litter deposited on the seafloor has to be surveyed once per two years using e.g fishing and bongo nets, and may be accompanied to monitoring of commercial fish; micro-particles in water and sediments should be monitored once per year.

4. **D11 (Underwater noise):**

   Up to-date monitoring and progress achieved: In participation of a Polish team, the project Baltic Sea Information on the Acoustic Soundscape (BIAS, Life+) runs currently covering the whole Baltic Sea. The project goals are aimed at linking the gap between the indicators of Marine Strategy Framework Directive (MSFD) descriptor 11 and actual management of human-induced underwater noise.
The published project’s guidelines for measurements and computed metrics of an underwater noise are based on the recommendations from publicly available guidelines as the report of the Technical sub-group of Underwater Noise, the offshore wind farms measurement instruction for underwater sound monitoring, the TNO Reports and the NPL good practice guide for underwater noise measurements. The BIAS guidelines intend to summarize former experiences for adapting them to the purpose of the BIAS project.

Only first deployed instrument are recovered for further analysis of records.

**Existing gaps:**

i. There is no systematic recordings of impulsive noise sources.

ii. Up to now there is no information concerning spatial distribution of ambient noise and its trends for aby marine sub-division.

iii. There is lack of knowledge regarding the impact of underwater noise on specific for the Baltic Sea marine species.

iv. In the frame of the BIAS project in the area of the PEEZ, the underwater noise monitoring will be performed predominantly in very shallow waters only.

**Monitoring program proposal:** Polish noise monitoring plans to include a full set of indicators developed by the MSFD.

**Emerging monitoring needs:** It is of great importance to convince relevant organizations of the Russian Federation to join programs of underwater transboundary monitoring of the underwater noise. International marine regulations are insufficient for preventing noise pollution of the oceans. Prevention of ocean noise pollution is still non-mandatory; For achieving GES targets the introduction of new regulations on anti-noise pollution would be needed. However, this pose to be

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difficult due to the lack of adequate knowledge of the noise influence on marine animals welfare (see Existing gaps).

SPANISH CASE STUDY

The MSFD was transposed in Spain, in the year 2010, by means of the Marine Environment Protection Law (Ley 41/2010, de 29 de diciembre, de Protección del Medio Marino). The main objective of this law is to reach or keep a Good Environmental Status (GES) by 2020. With this aim in view marine strategies are developed constituting the planning tools for the marine environment. In order to make the implementation process easier, the Marine Environment Protection Law divides the Spanish marine environment into five marine divisions: North Atlantic, South Atlantic, Estrecho and Alborán, Levantino-Balear and Canary. From each of these divisions a marine strategy will have to be developed and updated every 6 years.

The Ministry of Agriculture, Food and Environment (Ministerio de Agricultura, Alimentación y Medio Ambiente – MAGRAMA) by means of the Division for Sea protection (División para la Protección del Mar), lead by Ms. Ainhoa Pérez, is the authority responsible for the MSFD implementation in Spain and thus in charge of developing and implementing marine strategies in cooperation, among others, with the Spanish Oceanographic Institute (IEO), the Centre for studies and experimentation on public works (CEDEX) and TRAGSATEC S.A.

In order to facilitate the national coordination for the implementation of the marine strategies, and according to the article 22 of the Marine Environment Protection Law, the Inter-ministerial Commission of Marine Strategies (CIEM - in Spanish) that aims at coordinate the development, implementation and monitoring of the marine environment planning has been created.

Concerning the Initial Assessment, and according to Milieu Ltd Consortium (organization contracted by the EC for MS Initial Assessments assessment), Spain should improve GES definitions including, through regional cooperation (e.g. RSC), quantitative aspects and baselines and should ensure that the environmental targets cover all relevant pressures are SMART and sufficiently ambitious in order to achieve the requirements and timelines of the MSFD. Nevertheless, regarding the adequacy level of the overall assessment across MSFD articles 8, 9 and 10 (expressed as a percentage of the total possible score), Spain had, among

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23 Milieu Ltd Consortium. Technical Assessment of the MSFD 2012 obligations, Spain. 7 February 2014
all MS, the maximum adequacy score in the Mediterranean and the second one in the North East Atlantic Zone.\textsuperscript{24}

The MAGRAMERA has developed the Monitoring Programs Proposal by means of: (1) scientific-technical discussions on indicators; (2) an inventory of the existing monitoring programs; (3) proposal on the structure of monitoring programs and sub-programs and, (4) Discussion with monitoring programs responsible authorities on the programs design.

The following are the main findings concerning the monitoring programs of Spain marine waters regarding the indicators tackled by the COMMON SENSE project:

1. Eutrophication

   Up to-date monitoring and progress achieved:
   
   i. The existing monitoring programs (26) are related to the Water Framework Directive, OSPAR Convention and Barcelona Convention work carried out concerning this descriptor. Some of these programs are spatially or timely limited but some others can be integrated into the MSFD monitoring programs.
   
   ii. The main existing programs are carried out by MEDPOL and IEO (STOCA and RADIALES).

   Non-adequate monitoring efforts: Sampling methodology (including periodicity, stations position, depths) changes from region to region.

   Existing gaps: Concerning Canary, a new monitoring program has been suggested.

   Monitoring program proposal:
   
   i. The following eutrophication monitoring programs have been designed in order to enable the differentiation among natural variability caused by alien contributions: (1) EUT 1. Nutrients, oxygen and phytoplankton in coastal waters and (2) EUT 2. Nutrients, oxygen and phytoplankton in non coastal waters. These programs will be implemented in all Spanish marine divisions.
   
   ii. The competent authority for these programs is MAGRAMERA, together with the Autonomous Communities in the case of EUT1.
   
   iii. In general sampling will be done quarterly.
   
   iv. At least a change of 50% in nutrients concentration will be detected with a provability factor of 0.05 and a potency of 95% (6 years).

   Emerging monitoring needs:
   
   i. Additional sampling stations will be necessary for Canary division.

\textsuperscript{24} Ibidem.
ii. Additional monitoring stations will be necessary for the following divisions: Estrecho de Alboran, Levantino Balear, North Atlantic and South Atlantic.

2. Heavy metals

Up to-date monitoring and progress achieved:

i. Concentration will be only monitored in biota and sediment being out of the scope of the COMMON SENSE project.

ii. The EMEP Program (European Monitoring and Evaluation Programme) is mentioned, offering trans-bordering information regarding nutrients, persistent pollutants and heavy metals.

iii. Some autonomous communities measure heavy metals in coastal waters and these data will be integrated in the monitoring programs of the MSFD.\textsuperscript{25}

Existing gaps: Heavy metals in the water column are really difficult to measure due to its low concentration and, in addition, it is difficult establish a pollution level taking into account the results obtained. In this sense, results have to be compared with biota and sediment values.

Monitoring program proposal: Regarding monitoring programs addressing contaminants, only met-b (metals in biota) and met-s (metals in sediment) focus on heavy metals but none of them does it for the water column, being out of the COMMON SENSE scope. Spain will focus on sediments and biota according to the Directive of Priority substances (Directive 2013/39/EU). This Directive establishes biota EQS for mercury but concerning cadmium and lead, they can be measured either in water or in biota/sediment (Article 3(3)).

Emerging monitoring needs: According to Article 3 (6) of the Directive of Priority substances, Member States shall arrange long-term trend analysis of concentrations of those priority substances that tend to accumulate in sediment or biota, among them, mercury, cadmium and lead. However, no EQS are fixed for these three substances in biota/sediments. In this sense, Spain has tried to fix EQS for these substances two years ago but unfortunately a consensus has not been reached.

\textsuperscript{25} Interview to Ms. Ainhoa Pérez Puyol and Ms. Sagrario Arrieta Algarra (Directorate General for the Sustainability of the Coast and the Sea- Ministry of Agriculture, Food and Environment ) carried out within the framework of WP1.1. of the COMMON SENSE Project. July 2014.
3. Marine Litter: microplastics

Up to-date monitoring and progress achieved:

i. Monitoring experiences are limited and focused on macro litter in beaches, seabed and water surface.
ii. This is a common indicator for the Barcelona Convention (nº17 in ECAP) and it includes the tendencies in the microplastics quantity.
iii. There are no existing programs. Only experimental sampling campaigns are carried out by IEO (PELACUS) that assesses stocks. This program would be adapted to other programs.
iv. Some activities have been carried out in 2012 in North Atlantic.

Existing gaps:

i. Since no baselines are established, Spanish monitoring program for marine litter aims at ensuring the GES for Descriptor 10, i.e. ensuring that marine litter amount present in marine waters is not dangerous for marine and littoral environment.
ii. An important gap is detected concerning marine litter monitoring in biota.
iii. It will be necessary to develop a study in order to fix reference levels and/or use existing regional studies.
iv. This is a common indicator for the OSPAR Convention so it will be soon included in monitoring tasks.

Monitoring program proposal:

i. The following monitoring program was suggested by the MAGRAMA in order to address microplastics in water: BM-4: Microparticles in water (BM-micro).
ii. The competent authorities for this programs is the MAGRAMA together with the IEO.

Emerging monitoring needs:

i. Lack of standardized means. Spain is working on this by means of the Marine Litter Working Group of the EC (TSG-ML).
ii. The IEO is developing a new methodology to monitor microplastics in the water column.
4. **Underwater noise**

**Up to-date monitoring and progress achieved:**

i. 6 programs, focusing on cetaceans, have been identified concerning underwater noise. However, the information gathered by these programs is not sufficient neither adequate to cover MSFD monitoring requirements.

ii. Indications for methodological implementation of this indicator have been established in the Methodological Guide on Underwater Noise developed by the sub technical group TSG-NOISE.

**Existing gaps:**

i. Monitoring is currently inexistent. OSPAR is planning to analyze the need of a regional plan for underwater noise monitoring in the Atlantic area by 2017. The Ministry is also in contact with underwater noise expert of the National Oceanic and Atmospheric Administration.

ii. No baseline values for anthropogenic underwater noise have been established in Spain since and there is not a good definition for Good Environmental Status for this descriptor.

iii. There isn’t a systematic register of impulsive noise sources.

iv. There is no information concerning spatial distribution of ambient noise in every marine sub-division and its evolution.

v. There is also a lack of knowledge regarding the impact of underwater noise on marine species.

**Monitoring program proposal:**

i. The following monitoring programs have been set: (1) RS.1. Spatial and temporal distribution of impulsive noise of low and medium frequency - impulsive noise (RS1-IMP) and (2) RS.2.Low frequency continuous noise - ambient noise (RS-AMB).

ii. The competent authorities for the RS1-IMP are the MAGRAMA and the Ministry of Industry, Energy and Tourism (MINETUR).

iii. RS- AMB will allow providing an underwater noise map on the different by means of a validated propagation model created using real measurements from observation stations and noise measurement campaigns.

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26 Interview to Mr. Víctor Escobar (Chairman of the OSPAR Commission) carried out within the framework of WP1.1. of the COMMON SENSE Project. July 2014.
Emerging monitoring needs:

i. RS1-IMP and RS-AMB are programs of new design.

ii. A list of impulsive noise generating activities that surpass the thresholds established in the methodological guide will be created within the RS1-IMP program. The format and content of this register will be adapted to the OSPAR protocol.

iii. The aim of RS1-IMP and RS-AMB is to gather valuable information regarding this descriptor but it will be no possible to know if it has been achieved the GES.
4 IMPLEMENTATION IN THE EUROPEAN UNION

4.1 Legal frameworks and MSFD implementation authorities in each Member States

All Member States have transposed the MSFD into their National legislation, including Poland (early 2013). By November 2013, thirteen conformity studies had been undertaken (for BE, BG, DK, ES, IT, LV, LT, NL, PL, PT, RO, SI, SE, and UK)\(^\text{27}\) and the remaining countries are underway. Landlocked Member States (i.e., AT, CZ, HU, LU and SK) do not have this responsibility.

Table 2. Legal acts for the MSFD transposition in MS and responsible authority for MSFD implementation at a national level

<table>
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<tr>
<th>Member States</th>
<th>Legal acts for the MSFD transposition</th>
<th>Responsible Authority</th>
</tr>
</thead>
</table>
| Belgium       | Royal Decree on the Marine Strategy of the Belgian sea (2010) | • The Marine Environment Service of the Health  
                • Food Safety and Environment Federal Public Service  
                • DG Environment  
                Website: http://www.beldonor.be/eportal/Environment/index.htm |
| Bulgaria      | Ordinance on the protection of the environment in marine waters (2010) | • Minister of Environment and Water  
                Website: http://www2.moew.government.bg/index_e.html |
| Czech Republic| Not applicable |
                Website: http://www.nst.dk |
                Website: http://www.bmu.de |
| Estonia       | Estonian Water Act (2011) | • Ministry of Environment  
                Website: http://www.envir.ee |
| Ireland       | The Marine Strategy Regulations (2010) | • Ireland Department of the Environment, Community and Local Government (DECLG)  
                Website: http://www.environ.ie |
| Greece        | Law 3983/2011 on the protection and management of the marine environment. | • Special Secretariat for Waters of the Ministry of Environment, Energy and Climate Change  
                Website: http://www.ypeka.gr |

\(^{27}\) Please see Annex III for MS abbreviations
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<th>Authority</th>
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<td>France</td>
<td>Environmental code, which also applies to metropolitan areas under French sovereignty or jurisdiction</td>
<td>Ministry of Ecology, Sustainable Development, Transport and Housing (now entitled Ministry of Ecology, Sustainable Development and Energy)</td>
<td><a href="http://www.developpement-durable.gouv.fr">http://www.developpement-durable.gouv.fr</a></td>
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<tr>
<td>Malta</td>
<td></td>
<td>Office of The Prime Minister</td>
<td><a href="https://opm.gov.mt/home">https://opm.gov.mt/home</a></td>
</tr>
<tr>
<td>Austria</td>
<td>Not applicable</td>
<td>Federal Minister for Agriculture and Forestry, Environment and Water Management</td>
<td><a href="http://www.lebensministerium.at">http://www.lebensministerium.at</a></td>
</tr>
<tr>
<td>Slovenia</td>
<td></td>
<td>Ministry of the Environment and Spatial Planning</td>
<td><a href="http://www.mop.gov.si">www.mop.gov.si</a></td>
</tr>
</tbody>
</table>

The COMMON SENSE project has received funding from the European Union’s Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.
4.2 Marine Strategies - 1st phase of MSFD implementation

4.2.1 Introduction

According to articles 9(2) and 10(2) of the MSFD, MS were required to send notifications to the Commission by 15th October 2012 on the requirements included in the Articles 8, 9 and 10 of the directive:

1. An analysis of the essential features and characteristics (Article 8(a) of the DIRECTIVE 2008/56/EC).
2. An analysis of the predominant pressures and impacts (Article 8(b) of the DIRECTIVE 2008/56/EC).
3. An economic and social analysis (Article 8(c) of the DIRECTIVE 2008/56/EC).
4. GES definitions are presented in another additional document for each descriptor (Article 9 of the DIRECTIVE 2008/56/EC).
5. Establishment of environmental targets and indicators (Article 10 of the DIRECTIVE 2008/56/EC).

The competent authorities listed in the previous section were responsible for the implementation of the MSFD at national level as well as reporting and communication with the EC.

With this aim in view, the Commission developed and provided MS with reporting sheets, tools and guidance by July 2012.

On 2nd February 2014 the EC published a report on assessment and guidance of the first implementation phase of MSFD. The extent of assessments undertaken for the aforementioned report and outstanding gaps are summarized in the following table.
Table 3. Extent of assessments undertaken for the first phase of implementation of the MSFD and outstanding gap

<table>
<thead>
<tr>
<th>Extent of assessment</th>
<th>Countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full assessment (i.e. of all three articles and for all marine waters of the MS)</td>
<td>BE, CY, DE, EE, EL, ES, FI, FR, IE, IT, LT, LV, NL, RO, SE, SI</td>
</tr>
<tr>
<td>Partial assessment (i.e. not addressing all articles or all marine waters)</td>
<td>BG (for art. 9 and 10), PT (all waters except Azores and Madeira), UK (all waters except Gibraltar).</td>
</tr>
<tr>
<td>To be assessed (reports arrived too late for their inclusion)</td>
<td>BG (for art. 8), HR, MT, UK (Gibraltar).</td>
</tr>
<tr>
<td>To be assessed (reports not yet received)</td>
<td>PL, PT (for Azores and Madeira).</td>
</tr>
</tbody>
</table>

The technical assessment was carried out by external consultants that provided the Commission with all the information and background in order to carry out any follow-up actions and communication with the Member States and to develop an integrated assessment and guidance of the first phase of the implementation of the MSFD.

A first step was to check the completeness of MS’s electronic reports, allowing the detection of important gaps and the requirement, by the EC, of additional information. A second step included the assessment of the adequacy, consistency and coherence of the contents presented by the MS according to the criteria included in the Annex IV. A summary of the assessment and general conclusions were published separately per country and per regional sea and the key elements are included in the Annex V. Apart from the general conclusions and recommendations included in the section 2.3. of the present report, Annex III includes the specific recommendations set by the Commission for every country.

The Commission aims at promoting and improving the implementation of the MSFD by means of coordination, cooperation and common understanding among MS as well as at regional and EU levels. The Commission is aware about MS and RSC restrictions concerning administrative capacities, budget and resources constraints. Taking into account the transboundary nature of marine pollution, it has to be faced collectively and in an integrated way.

With this aim in view, the Commission will: (i) promote the Common Implementation Strategy (2014-2018); (ii) require strengthening the coordinating role of RSCs; (iii) improve the efficiency of implementation support by establishing a Project Coordination Group; and, (iv) make use of CIS Technical Groups for specific topics at EU level (e.g. marine litter and noise).

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29 Ibidem  
30 Reports per country and region:  
4.2.2 Implementation by Member States of Good Environmental Status, Initial Assessment and Environmental targets

Descriptor 5. Eutrophication - nutrients

The main human induced effect described for eutrophication is nutrient enrichment. This descriptor is one of the limiting ones in order to achieve GES in some marine regions. Input of nitrogen (N) and phosphorus (P) comes mainly from agriculture, waste water and other diffuse sources.

According to Annex I of the Directive, GES for Descriptor 5 is achieved when "human-induced eutrophication is minimized, especially adverse effects thereof, such as losses in biodiversity, ecosystem degradation, harmful algae bloom and oxygen deficiency in bottom waters". Most MS (except CY, LT, NL, PT) defined GES according to the criteria described. Nevertheless, except EL, none of the descriptions were assessed as adequate due to the incomplete coverage of indicators and lack of specificity and threshold or reference values. There was also a lack of clarity of GES links with WFD. Only FR covered all the indicators but MS covered most of them.

Most MS referred to WFD nutrients limits for coastal waters but this was not always clear (e.g., CY, DK, EL, FI), and some MS did not or partially referred WFD to definition.

Assessment methods adopted by MS were mainly related to those proposed by RSC:

3. For the Mediterranean, only Spain mentioned MEDPOL. FR and IT followed OSPAR.
4. The Black Sea Convention has not developed an approach to eutrophication assessment.

Only EL, ES, IE, LT, LV, SE and SI incorporated quantitative thresholds into their definition of GES. In this sense, for the remaining MS it is not possible to know when GES is achieved.

The level of coherence for GES is high in the Baltic and the North East Atlantic regions and moderate in the Black Sea and the Mediterranean regions.

Concerning Initial Assessment, all MS have provided nutrient input loads and environmental concentrations for the relevant nutrients (N and P). BE, DE, EE, EL, ES, LV, LT and UK have not provided much information on organic matter inputs and FI and FR provided old estimates. MS reports varied on the level of detail of reporting origin of pressures.
The Initial Assessment has been qualified as adequate for CY, DK, EL, ES, IE, SE and SI, and partially adequate for the remaining 12 MS.

The level of coherence for the Initial Assessment for eutrophication is high in the Baltic and the North East Atlantic regions and moderate in the Mediterranean regions.

Environmental targets have been defined by all MS except by PT:

1. “Most Member States (BE, CY, DK, EE, IE, LT, LV, NL, SE, SI) have established state/impact-based targets, effectively representing the achievement of GES.
2. Some Member States (BG, DE, EL, FR, IT, RO) provided only less ambitious pressure-based targets, while FI and ES provided targets based on both pressures and impacts.
3. The UK established a risk-and state/impact-based approach to target setting.”

The setting of targets has been assessed as adequate for BG, FI, IE SI and UK, partially adequate for BE, CY, DE, DK, EE, EL, ES, LV, NL and SE and inadequate for FR, IT, LT and RO. The level of coherence in the setting of environmental targets across the different regions is moderate being low in the North East Atlantic and Adriatic Sea sub-regions and high in the Celtic Seas, Ionian Sea and Central Mediterranean Sea sub-regions.

Methodologies established by RSCs have helped a lot in gaining coherence and consistency. The most difficult task was to establish quantified criteria and indicators and quantitative assessment of pressures and impacts.

The following two graphs summarize the overall adequacy and coherence of MSs’ reports.
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Descriptor 8. Contaminants – Heavy metals

According to Annex I of the Directive, GES for Descriptor 8 is achieved when “concentrations of contaminants are at levels not giving rise to pollution effects”. Almost all MS (except LV) have defined GES for contaminants but at very different levels. Regarding 8.1.1. it was covered by all MS except for BG and RO that stated that it was not possible to set GES for other criterion set out in the 2010 decision.

Water Framework Directive and its related Directives on Environmental Quality Standards (2008/105/EC as amended by 2013/39/EU) play an important role also for the MSFD implementation and provide reference point for the assessment. Most Member States directly or indirectly mentioned the list of WFD priority substances but only UK referred to the amended version of the list. Most MS mentioned that the three monitoring matrixes (water, biota and sediments) were considered. Nevertheless, EE, ES, FI, IT and LT referred only two out of three and BG, DK, NL and PT did not refer any matrix. Except BG, CY, DK, ES and FI, the MS thresholds established for GES comply with EQS.

Standards developed for RSCs were generally used:

1. BE, DE, ES, FR, IE, UK, EL, ES, FR, SI and RO have included a direct or indirect reference to the OSPAR Environmental Assessment Criteria (EACs).
2. Only ES has referred to the reference levels developed in the context of the Barcelona Convention
3. DE, EE and LT have referred directly to reference levels developed in the context of HELCOM.

The level of coherence for GES is low in the Baltic, high in the North East Atlantic regions and moderate in the Black Sea and the Mediterranean regions.

Concerning the Initial Assessment for descriptor 8 was, in general, complete providing a detailed, quantitative or trend-based assessment of the level of contamination except for six CY, EL, IT, NL, RO and SI. The most common contaminants assessed were heavy metals (mercury, lead and cadmium), among other, covered by the Directive 2008/105/EC and assessed at a regional level for a long time.

The methodologies used by MS are mostly based on OSPAR (Quality Status Report) and HELCOM (Holistic Assessment, HOLAS). In the Mediterranean, only CY and ES made use of MEDPOL assessments. WFD was mentioned by most North-East Atlantic Member States and CY, EE, ES, FR, LT, RO.

The initial assessments of DE, DK, ES, IE, FI and UK were judged to be adequate and inadequate for two IT and SI. The remaining eleven Member States’ assessments were partially adequate (BE, CY, EE, EL, FR, LT, LV, NL, PT, RO, SE).
The level of coherence in the Baltic and the North-East Atlantic regions was high while the Mediterranean region was low and in the Black Sea region it was not assessed due to the late arrival of the BG report.

The following two graphs summarize the overall adequacy and coherence of MSs’ reports.

**Figure 4. Summary of the assessments of adequacy of Member State’s reports for MSFD Articles 8, 9 and 10 for Descriptor 8 on contaminants. The bars indicate the number of Member States which were assessed as adequate, partially adequate and inadequate.**

**Figure 5. Summary of the assessments of coherence of Member State’s reports within each region for MSFD Articles 8, 9 and 10 for Descriptor 8 on contaminants. The bars indicate whether the reports were assessed as having a low, moderate or high level of coherence within each region.**

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Descriptor 10. Marine Litter - microplastics

According to Annex I of the Directive, Descriptor 10 is at GES when "properties and quantities of marine litter do not cause harm to the coastal and marine environment". Concerning GES definition:

MS have followed the description definition but not with the criteria and indicators established by the Commission. BG, EE, LT, LV and RO have not defined GES for marine litter. FR reported a detailed GES definition and how progress can be measured and thus was the only MS assessed as having an adequate GES definition. DK, FI, IE, SE, SI and UK were assessed as partially adequate and BE, CY, DE, EL, ES, IT, NL and PT as inadequate.

The overall level of coherence in the definitions of GES for marine litter was high in the North East Atlantic region, moderate in the Mediterranean region and low in the Baltic Sea region.

A lack of agreed methodologies and systematically reporting were reported by most of the MS regarding descriptor 10. Most information referred to litter at the coast, biota and seabed. Little information was included on litter in the water column (including micro-particles)

Some MS stated that GES regarding marine litter was not good and almost all MS aim at reducing marine litter in specific locations (on the beach, in the water column, or on the sea floor) and/or by type (microplastics or ingested).

BE, DE, EL, ES, FR, IE, LT, SI and UK reports on the initial assessment of marine litter was assessed as adequate. DK, IT, NL and SE reports were assessed as partially adequate and for CY, EE, FI and LT as inadequate. LV and RO did not report on this descriptor.

Concerning environmental targets (reduction targets) defined for marine litter require further specification. BG, CY, LT, LV and RO have not defined reduction targets and only three quarters of the MS set measurable targets.

Targets on microplastics have been set by some MS. Many MS stated that it is necessary to increase the knowledge on how to address the identified gaps and to better assess the impact on marine environment.

Environmental targets of BE, DE, ES, FR, IT, NL, SI, SE and UK were assessed as partially adequate and as inadequate for DK, EE, EL, FI, IE and PT. BG, CY, LT, LV, RO did not define targets for Descriptor 10.

The following two graphs summarize the overall adequacy and coherence of MS’ reports.

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Figure 6. Summary of the assessments of adequacy of Member State’s reports for MSFD Articles 8, 9 and 10 for Descriptor 10 on marine litter. The bars indicate the number of Member States which were assessed as adequate, partially adequate and inadequate. 36

Figure 7. Summary of the assessments of coherence of Member State’s reports within each region for MSFD Articles 8, 9 and 10 for Descriptor 10 on marine litter. The bars indicate whether the reports were assessed as having a low, moderate or high level of coherence within each region. 37
Descriptor 11. Underwater noise

According to Annex I of the Directive, Descriptor 11 is at GES when "introduction of energy, including underwater noise, is at levels that do not adversely affect the marine environment".

All MS (except BG, EE, LT, LV and RO), have defined GES for descriptor 11 but with different approaches. Only three Member States (DE, FR, UK) have provided threshold values for GES. Two MS (FR and UK) have an adequate GES definition, six MS were partially adequate (BE, DE, EL, IE, SE, SI) and seven Member States were inadequate (CY, DK, ES, FI, IT, NL, PT). Only DE has covered other sources of energy.

The overall level of coherence in the definitions of GES for underwater noise was low in the Baltic Sea and the North East Atlantic region, high in the Celtic Seas subregion and moderate in the Mediterranean.

Concerning the Initial Assessment seven MS carried out a limited assessment (BE, CY, DK, EE, LT, NL, PT), six provided a more detailed assessment (DE, ES, FR, IE, SI, UK) provided a more detailed assessment and the rest (EL, IT, LV, PT, RO, SE) have not undertaken any initial assessment.

The initial assessment was in general quite poor including causes of pressure and information gaps. Only FR and IE have made a quantification of the proportion of their assessment area affected, FR assessing continuous sounds and IE impulsive sounds. IE concluded that 1% of its area is affected by noise pressure and FR concluded that 75-100% of its area is affected by noise pressure. Nevertheless, no MS has specified if the current level of pressure of noise impact was acceptable.

FR and ES have developed an inventory of the level of underwater sound based on sources. ES has reported cumulative sources and FR has elaborated two maps, one for impulsive sounds and one for ambient noise. SI has carried out a recent underwater noise monitoring.

DE, ES, FR, IE, SI and UK initial assessment were assessed as adequate, EE, FI and LT initial assessment were assessed as partially adequate and for the remaining MS (BE, CY, DK, NL) inadequate.

The level of coherence was low for the Mediterranean, moderate for the Baltic Sea and relatively high for the North East Atlantic region.

Concerning the environmental targets MS (except for BG, CY, IE, IT, LT, LV, RO, SE) have defined environmental targets and associated indicators for this descriptor but targets are very different from MS to MS:

1. ES, FR, NL, PT, SI: included high-level qualitative targets.
2. BE, DE have defined specific noise exposure targets that will be included in the Environmental impact assessment legislation to wind farms.
3. DK reported target impulsive sounds.
4. UK defined very specific targets.

UK environmental targets were assessed as adequate; BE, DE, DK, FI and FR were assessed as partially inadequate, and the remaining MS as inadequate (EE, EL, ES, NL, PT, SI).

Environmental targets definition coherence was low for the Baltic Sea and the North Atlantic Sea and moderate for the Mediterranean.

The following two graphs summarize the overall adequacy and coherence of MS’ reports.

![Graph](image)

*Figure 8. Summary of the assessments of adequacy of Member State’s reports for MSFD Articles 8, 9 and 10 for Descriptor 11 on energy including underwater noise. The bars indicate the number of Member States which were assessed as adequate, partially adequate and inadequate.*

Figure 9. Summary of the assessments of coherence of Member State’s reports within each region for MSFD Articles 8, 9 and 10 for Descriptor 11 on energy including underwater noise. The bars indicate whether the reports were assessed as having a low, moderate or high level of coherence within each region.39

4.2.3 Recommendations and conclusions

The implementation of the first phase of the MSFD was very challenging since many new elements and ambitions were introduced in the Directive and applied for the first time. Several gaps were identified and recognised:

1. “Most of the results were built on work/data which pre-dated the MSFD (2010) and few new data and assessments were used.
2. Most of the regional assessment work, on which MS must rely upon, was only partially updated or not at all since the MSFD entered into effect, because the timelines for these assessments had not (yet) been aligned with the MSFD deadlines.
3. There was also a lot of work in progress (and not finalised in time) to address shortcomings already identified.
4. Some identified deficiencies led to subsequent actions, e.g. at regional level, because some joint assessments of Member States already indicated that more work would be necessary.
5. The process was not helped by delays in finalising the reporting templates, guidance and technical infrastructure, which themselves depended upon adoption of the GES

**Decision in 2010 and development of common understandings on GES under the MSFD CIS process.**

6. *The Commission recognises that all these aspects contributed to some of the lack of clarity and possible inconsistency in the Member States' reports*.40

### 4.2.3.1 Overall assessment

The *adequacy level of the overall assessment*, it was assessed as being moderate to low since even those MS with higher scores have had shortcomings. UK and ES (North East Atlantic and Mediterranean) were scored 70% and 60% respectively having the maximum adequacy score. All other MS were below 55% being 9% the lowest score (RO), see the graphic below.

*Figure 10. Summary of the overall adequacy scores per Member State across MSFD articles 8, 9 and 10. The scores are expressed as a percentage of the total possible score, with MS grouped per marine region (hence SE, DK, DE, FR and ES appear twice).*41

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41 Ibidem.

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The North East Atlantic region MS showed the highest level of coherence followed by the Baltic and the Mediterranean.

4.2.3.2 Good Environmental Status

Concerning the Good Environmental Status definition, this is the key aspect in order to base the following actions. Apart from those descriptors that were already well assessed (i.e. eutrophication and chemical pollution), an effort has been made in order to address other descriptors in a systematic way (e.g. marine litter and underwater noise). This will enable a more integrated assessment of the health of marine ecosystem.

Most MS have managed to introduce GES for all the descriptors, and some of them took advantage of the MSFD in order to enforce GES improvement by means of regulatory instruments. MSFD implementation has also fostered coordination and agreements on assessing GES among MS by means of the RSCs. This process has promoted the integrated implementation of other directives.

Although a big effort has been made, most of the MS definitions for GES were not assessed as adequate to accomplish all the objectives set by the MSFD. GES definitions vary among different MS and RSCs resulting in different levels of ambition on marine environmental quality and coherence. The level of GES, in general, does not go beyond the existing commitments probably resulting in a light improvement of the environmental quality of our marine oceans. In particular:

1. “many GES characteristics have not been set in a measurable and enforceable way, sometimes not going beyond what Annex IV and the GES Decision already described; in some cases there seems to be a confusion between definition of GES and the setting of targets;”
2. there is a large diversity in understanding and approaches between Member States; the interpretation and application of the provisions of Article 9 are very different;
3. Member States are not building adequately upon other EU legislation and have adopted a “pick-and-choose” approach from the work undertaken (and agreed) in the Regional Sea Conventions to which they are Parties.”

A list of recommendations was set by the EC in order to rectify these shortcomings. MS should use the following recommendations when defining their monitoring programs and programs of measures in order to improve the GES by 2020:

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42 In this report.  
1. At EU level:
   i) Revise and strengthen the GES decision 2010/477/EU by 2015 in order to establish coherence and comparability among GES criteria and methodological standards.
   ii) Further develop a common understanding on the obligations of GES definitions and assessment.
   iii) Ensure an adequate, coherent and comparable approach of GES and its improvement among the different MS and regional seas.

2. At regional level:
   i) Develop specific criteria for GES (targets and indicators)
   ii) Promote further coordination at regional/ sub-regional level.
   iii) Ensure that results arising from the regional work carried out benefit from the progress made at EU level.
   iv) Identification of knowledge gaps in a systematic way enabling more ambitious risk-based setting of GES.

3. At national level:
   i) MS should consider the recommendations established when defining monitoring and measure programs.
   ii) Use existing EU standards as minimum requirements or, on their absence, those developed by RSC.

4.2.3.3 Initial Assessment

An initial assessment was carried out by MS aiming at assess how far is the current environmental status from GES, once GES was defined. Initial assessment it is very challenging because:

1. It has to integrate in a holistic way environmental and economic aspects (including pressures and impacts).
2. It has to include and set limits for some indicators from which low information is available (e.g. marine litter and underwater noise).
3. Many gaps to be covered were identified during the assessment.
4. The establishment of environmental targets, monitoring programs and measure program will be based on the evidences included in the initial assessment.
Exemptions to not achieving GES have to be very well justified by MS. This topic is currently being discussed since it is very important for monitoring programs development and the EC aims at reaching consensus among MS.  

Member States have made a big effort in order to compile all MSFD related evidences concerning marine protection. Nevertheless the information was not complete and the methodologies applied for the assessment were not coherent and comparable among MS since it was based on previous assessments. Almost no MS established a baseline and distance to target. A lack of information was also detected for the socio-economic analysis.

The European Environmental Agency is preparing an EU baseline report on marine environment status using the assessments provided by the MS. In addition, the Joint Research Centre on the Commission is analysing approaches and methodologies used in order to have the documentation on this issue published by 2014.

The Commission has set a list of actions in order to improve adequacy and coherence of the initial assessment and they will be implemented at different levels:

1. At EU level:
   i) Ensure more coherent and consistent approach in future initial assessments by reviewing and amending, if necessary, Annex III of the MSFD.
   ii) Develop a data information system to effectively share information between EU, regional and national level.
   iii) Use the assessments in other related legislation.
   iv) Agree and develop standard methods to establish the distance to GES.
   v) Take into account the improvement of socio-economic assessments and data availability when defining measure programs.

2. At regional level:
   i) Align assessment methodologies and timetables.
   ii) Identify the gaps and implements initiatives all together by means of projects, research activities, etc.

3. At national level:
   i) Address shortcomings and gaps identified by means of the monitoring programs.
   ii) Improve and extend the use of the work undertaken.

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44 Interview to Ms. Ainhoa Pérez Puyol and Ms. Sagrario Arrieta Algarra (Directorate General for the Sustainability of the Coast and the Sea- Ministry of Agriculture, Food and Environment ) carried out within the framework of WP1.1. of the COMMON SENSE Project. July 2014.
4.2.3.4 Environmental targets established

Environmental targets have to be consistent since they are set in order to progressively achieve GES. MS have set many different kinds of environmental targets and at different ambitious levels. Nevertheless, most of the environmental targets included in MSs’ reports are not apparently sufficient to reach GES since they don’t focus sufficiently on the main pressures and their impacts or they are not precise enough.

The EC has set the following list of recommendations in order to improve the adequacy and coherence of the environmental targets:

1. At EU level:
   i) Make the role of environmental targets within the MSFD clear mainly on the determination of GES.
   ii) Exchange experiences and best practices among Member States.
2. At regional level:
   i) Set environmental targets.
   ii) Exchange experiences.
3. At national level:
   i) Review environmental targets for the development of monitoring and measures programmes.

4.2.3.5 Regional cooperation

RSCs are doing a big effort in order to ensure coordination and cooperation among the MS belonging to different regional seas. This cooperation has been and is a key issue for the successful implementation of the MSFD and its results. The new work programme for the Common Implementation Strategy for 2014 and beyond, developed by the Commission services, will include a clarification on of the geographical scope for assessment and reporting.

Most MS have already made an effort in order to define marine sub-divisions but there are some aspects, such as the extend of implementation on the continental shelf beyond EEZ, that require further clarification for those concerned MS. It is necessary to develop a common reporting system which is of practical application for management needs and administration.

Another transversal aspect is the link of the MSFD with other European policies and the integration of their implementation. In some cases MS have detected the role of the pieces of legislation that could converge with the MSFD but in some cases is not very clear how these pieces of legislation inter-relate. These relationships will have to be further clarified, specified and implemented accordingly and in an integrated manner (including objectives, assessment methods, monitoring, measures, information systems, etc.).
4.2.3.6 Monitoring programs and programme of measures

MS are required to establish and implement monitoring programs by 2014 and measures programs by 2015. Both programs will have to be built on the previous analysis, assessment and definitions required by Article 8, 9 and 10 of the MSFD.

The Commission requires a progressive implementation, recognizing that not all necessary adaptations could be implemented at once. In this sense, MS will have to define an approach with step-by-step improvements assigning responsible entities for each monitoring activity. The Commission will support MS implementation by means of the Common Implementation Strategy and promoting regional cooperation mechanisms. The aim of this plan is to provide MS with tools to overcome deficiencies and ensure a correct implementation of the MSFD. This approach is inspired by the development of “Structured information and implementation frameworks” (7th Framework Program) and the implementation Communication (COM(2012) 95).

With this aim in view, the Commission has set some recommendations in order to improve the step by step implementation of monitoring and measures program at different levels:

1. At EU level:
   i) Ensure the improvement of the implementation of the MSFD according to the Common Implementation Strategy.
   ii) Promote the use of update GES and environmental targets, when available, agreed by regional cooperation.
   iii) Promote regional cooperation among MS by means of the RSC.

2. At regional level:
   i) RSCs should review regional monitoring program tasks planned/carried out.
   ii) RSCs should review cooperation measures.

3. At national level:
   i) Update national GES definitions as a reference point for the establishment of the following programmes.
   ii) When updating GES is not possible it would be necessary to identify gaps and provide justifications.
5 IMPLEMENTATION OF MSFD IN IRELAND

The Marine Strategy Framework Directive (MSFD) came into effect on June 17, 2008. The deadline for its transposition into the domestic law of Member States was July 15, 2010. Following a formal notice from the European Commission to the Irish Government in November 2010 and a Reasoned Opinion in April 2011, the MSFD was finally transposed into Irish law through the European Communities (Marine Strategy Framework) Regulations 2011 on May 31, 2011.

The following sections and chapters detail the different aspects of MSFD implementation in Ireland, ranging from regulatory arrangements and institutional frameworks through to stakeholder consultation processes and current systems for marine management and marine environmental quality monitoring.

5.1 Marine management in Ireland

Historically the regulation of marine activities at government level in Ireland has been dealt with sectorally and in a fragmented manner. The marine sector in particular has experienced considerable change over the last decade in terms of marine functions being transferred across different Government Departments and Departments also undergoing a series of portfolio changes reflecting the changing manner in which marine governance is administered.

Current marine management in Ireland spans a number of Government Departments and involves a number of State agencies and organisations, each with a remit and responsibility for different aspects of marine affairs, e.g. fisheries, energy, transport and conservation of biodiversity (see Table 4).

A significant step with regard to establishing a more integrated approach to marine management at Government level was the establishment of an Inter-Departmental Marine Coordination Group (MCG) in April 2009. The Group comprises the most senior civil servants from the Departments of Agriculture, Fisheries and Food; Communications, Energy and Natural Resources; Defence; Enterprise, Trade and Employment; Environment, Heritage and Local}

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48 Taoiseach is the Irish language term used to describe the head of Government or Prime Minister.

A brief overview of each of the statutory bodies contained in Table 4 is provided to give further insight to the competencies and roles of these organisations with respect to marine management.

**Department of Agriculture, Food and the Marine (DAFM)**

The DAFM has responsibility for a number of functions relating to the marine environment, including development and implementation of national and EU schemes in support of fisheries, and regulation of fisheries through national and EU legislation. The Department contains a number of divisions will direct responsibility for marine related affairs, including for example: seafood policy and development; marine Engineering; aquaculture and foreshore management; marine agencies and programmes; and, sea fisheries administration. In 2010, the DAFM published *Food Harvest 2020 - A Vision for Irish Agri-food and Fisheries* – a strategy document which outlines a series of recommendations for the seafood sector and will influence policy with regard to marine aquaculture and fisheries.
Department of Communications, Energy and Natural Resources (DCENR)

The DCENR has a number of functions, distributed across its divisions, which are relevant to marine resource management and environmental protection. For example, the Exploration and Mining Division of the Department is charged with implementing the Minerals Development Acts to minerals exploration and development. The Petroleum Affairs Division (PAD) is tasked with maximising the benefits to the State from exploration for and production of indigenous oil and gas resources, while ensuring that activities are conducted safely and with due regard to their impact on the environment and other land/sea users. The PAD has overseen the completion of a series of offshore Strategic Environmental Assessments (SEA) for Irish jurisdictional waters, each of which contain ecological and physio-chemical environmental information.

Another division of the DCENR is the Geological Survey of Ireland (GSI) is Ireland's National Earth Science Agency which is responsible for providing geological advice and information. Together with the Marine Institute, the GSI has completed extensive mapping of Ireland's seabed resources, initially under the National Seabed Survey (NSS) from 1999-2006, and more recently as part of the INtegrated Mapping FOr the Sustainable Development of Ireland's MArine Resource (INFOMAR) programme (2007 – present).

Department of Environment, Community and Local Government (DECLG)

The DECLG is responsible for policy and legislation in relation to water quality issues and for the implementation of a number of EU Directives linked to environmental protection of aquatic resources, e.g. Bathing Waters (76/160/EEC), Shellfish Waters (79/923/EEC), Water Framework Directive, and the Marine Strategy Framework Directive (see Section 5.2). The DECLG interacts closely with the Environmental Protection Agency (EPA) - the statutory body responsible for protecting the environment in Ireland. The EPA is an independent public body; its sponsor in Government is the DECLG. In terms of marine environmental protection, the remit of EPA covers for example, licensing for dumping at sea activities and other waste management activities, and strategic environmental assessment.

Department of Transport, Tourism and Sport (DTTS)

The marine aspects of the DTTS’s portfolio are relevant to the shipping, fishing and leisure, and maritime safety sectors, and are coordinated by the Irish Maritime Administration (IMA); the objective of which is to integrate the planning and delivery of all the maritime services of the Department under a single national office. The establishment of the IMA is central to the Department’s drive for more efficient and effective delivery of maritime services; it comprises the Maritime Safety Policy Division, the Marine Survey Office, the Irish Coast Guard, the Maritime Transport Division and a new Maritime Services Division.
Department of Defence (DoD)

The Department of Defence is the parent department for the Irish Naval Service which is the State’s principal seagoing agency with a general responsibility to meet contingent and actual maritime defence and security requirements. The INS fleet comprises eight vessels and the number of naval personnel is currently at approximately 1100. The activities of the INS are governed by national (e.g. fisheries protection; Sea Fisheries Protection Act, EU and international legislation (e.g. International Law of the Sea). Key responsibilities include for example the following: sea fisheries protection; security - protection of assets, e.g. mineral or offshore renewable energy; operations relating to maritime surveillance and defence.

Department of Arts, Heritage and the Gaeltacht (DAHG)

The DAHG responsibilities with respect to marine management extend to the protection and conservation of heritage (natural, built and archaeological). The National Parks and Wildlife Service (NPWS) section of the Department manages the Irish State's nature conservation responsibilities under national and European law, this includes the designation and protection of Special Areas of Conservation (SACs), Special Protection Areas (SPAs) as part of the Natura 2000 framework. The Marine Research Unit of the NPWS conducts research to facilitate the designation of areas to protect marine habitats and species, management of protected marine habitats and species, and implementation of Ireland’s national and international biodiversity obligations and commitments. Within the DAHG the National Monuments Service performs similar functions with respect to archaeological heritage. The Underwater Archaeology Unit (UAU) was established within the National Monuments Service to manage and protect Ireland’s underwater cultural heritage; UAU’s brief includes the quantification of the underwater resource, underwater survey, excavation, dealing with threats to the underwater heritage and assessing development impacts in order to manage and protect this aspect of Ireland’s heritage.

Marine Institute (MI)

The Marine Institute is Ireland’s national agency responsible for marine Research, Technology Development and Innovation (RTDI). The Institute’s main purpose is to assess and realise the economic potential of Ireland’s 220 million acre marine resource; to promote the sustainable development of marine industry through strategic funding programmes and essential scientific services; and to safeguard Ireland’s marine environment through research and environmental monitoring. The Marine Institute centres its activities round five main areas: fisheries ecosystems advisory services; marine environment and food safety services; ocean science and information services; the Irish maritime development office; and corporate services. The Marine Institute is assisting the DECLG in managing the implementation of the MSFD.
5.2 Implementation of the MSFD in Ireland: implementation process, competent authorities and regulatory framework

The relevant government authority (or ‘Competent Authority’ as referred to in to MSFD) in Ireland tasked with fulfilling a statutory remit as set out in the Directive is the Department of the Environment, Community and Local Government (DECLG). Although not underpinned by the regulations of the MSFD, because of the cross-cutting nature of marine issues, four other Departments are intrinsically linked into the process—Department of Agriculture, Food and the Marine (DAFM), Department of Transport, Tourism and Sport (DTTS), the Department of Arts, Heritage and the Gaeltacht (DAHG) and the Department of Communications, Energy and Natural Resources (DCENR). In addition, the Marine Institute (MI), drawing on its expertise in the areas of: Fisheries Ecosystem Advisory Services; Marine Environment and Food Safety Services; and Ocean Science and Information Services, has a major role to play in the delivery of the Directive (although specifically through its marine monitoring activities as well as representation in all of the MSFD Working Groups).

All EU Member States must define the extent of their marine waters in line with the obligations set under the MSFD. For the purpose of the Directive ‘marine waters’ are defined as the:

“seabed and subsoil on the seaward side of the baseline from which the extent of territorial waters is measured extending to the outmost reach of the area where a Member State has and/or exercises jurisdictional rights, in accordance with the United Nations Convention on the Law of the Sea (UNCLOS or Law of the Sea Convention).”

The extent of the Ireland’s marine waters can be seen in Figure 11. For the purposes of the MSFD Ireland’s assessment area is deemed to consist of the combined spaces of Area 1 and Area 2, a total of 490,000km². Ireland’s Exclusive Economic Zone (EEZ) is shown as Area 1, while Ireland has a limited form of jurisdiction over the natural resources located in, on or under the seabed of an area of the continental shelf adjoining the Porcupine Abyssal Plain (Area 2). Areas 3 and 4 are agreed to 200 miles but beyond that decisions on the final outer continental shelf limits have yet to be sanctioned by the UN under international law (Law of the Sea Convention).
The COMMON SENSE project has received funding from the European Union’s Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.
Marine Institute who in turn engaged a private environmental consultancy (RPS Group PLC), to prepare Ireland’s submission to the European Commission.

Ireland’s MSFD Initial Assessment Report was published in late October 2013. The primary objective of the Initial Assessment was to establish a baseline – to complete a stock-take of existing data holdings and data gaps; no new research was carried out during the assessment exercise\(^{53}\). The report drew on a large range of data and information sources, including national monitoring and assessment reports, e.g. Marine Institute (2010)\(^ {54}\), Tully and Clarke (2012)\(^ {55}\), national survey results, e.g. An Taisce (2009)\(^ {56}\), Folegot et al. (2013)\(^ {57}\), and scientific literature, e.g. Hynes and Farrelly (2012)\(^ {58}\), together with State, consultancy and academic expert knowledge. Ireland’s Marine Atlas (http://atlas.marine.ie) which collates relevant data and information on the marine environment was also launched at the same time as the publication of the Initial Assessment Report.

The key findings of the Initial Assessment Report in terms of marine environmental quality are as follows:

1. In general, seabed habitats are considered to be in a healthy condition.
2. The main human sources of nutrient enrichment into the Irish assessment area are agricultural activities, waste water discharges and run-off from unsewered properties. The overall nutrient status is considered good and consistent with the achievement of GES.
3. Seafood from Irish waters consistently complies with maximum standards set in EU law for non-synthetic contaminants.
4. The level of radio-nuclides in shellfish samples is very low with the majority of measurements being close to or below limits of detection.
5. In terms of increasing marine acidification, there is evidence to suggest that the pH level in Ireland’s offshore waters is decreasing.

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6. Bathing water quality is generally high in Ireland with 93% of designated bathing waters meeting the minimum standard under the EU Bathing Water Directive.

7. Current evidence suggests a minimal impact of marine litter on cetacean and seal populations, though the relationship between the volume and type of marine litter and the impact on the marine environment is not fully understood.

8. As offshore exploration and renewable energy activity increases, a corresponding increase in impulsive and continuous noise is likely in the marine environment.

With regard to the economic and social analysis undertaken for the Initial Assessment (as per Article 8.1(c) of the MSFD), a marine water accounts method was used. Using this methodology, the main economic sectors utilising Ireland’s marine waters were determined, and the impacts of the activities of these sectors were then also determined. The marine water accounts method was complemented by a second method of analysis – ecosystem service assessment – which was applied to cases where the sector in question (e.g., wastewater treatment) is better reflected by the value of the service rather than in terms of turnover, value added and employment.

The final component of the economic and social analysis was choice experiment evaluation involving a survey of 817 individuals which were representative for the entire population aged 18 years and older. The choice experiment provided survey respondents with the potential socio-economic benefits of implementing the MSFD in Irish waters under three hypothetical scenarios (low, medium and high level of environmental degradation) each of which was defined by examining the welfare loss incurred by society due to changes in marine environmental attributes (Marine Institute and Department of Environment, Community and Local Government, 2013). The results of the assessment indicate that the total annual value of the welfare loss that is attributable to marine environmental change away from a “status quo” scenario ranged from €195 million at a low level of degradation to €521 million if human activities result in a high level of degradation; thus, suggesting that considerable economic gains may be achieved from the full implementation of the MSFD in the Irish marine environment.

Public Consultation

The publication of ‘Ireland’s Marine Strategy Framework Implementation’ (Department of the Environment, Community and Local Government, 2012) was part of a public information
process which aimed to promote awareness of MSFD implementation in Ireland. Public consultation was limited in the immediate period subsequent to the publication of ‘Ireland’s Marine Strategy Framework Implementation’, the totality of public consultation in the MSFD process in Ireland from December 2012 to October 2013 amounted to an online invitation to comment on an information booklet and the 133 reporting sheets submitted to the European Commission. However, on November 1, 2013, Mr Phil Hogan T.D., the then Minister for the Environment, Community and Local Government, announced a public consultation process related to the MSFD, the purpose of which was to foster engagement and to achieve a greater awareness of the MSFD and its implementation in Ireland. A public consultation workshop hosted by the DECLG was held in Dublin on November 11, 2013. However, it is important to note that:

- certain stakeholders were targeted directly and an open invitation to attend this workshop was not advertised on the DECLG website; and,
- during the workshop, stakeholders were informed that the document (on which comment was originally invited on or before January 10, 2014) was the final version and no changes would be incorporated based upon the current consultation process, or the outputs from that workshop (Sustainable Water Network, 2014).

A response to the public consultation in January 2014 was submitted by a network of environmental non-government organisations (Sustainable Water Network – SWAN) which outlined how the current consultation process for MSFD in Ireland is fundamentally flawed since interested parties were invited to comment on a document that had already been finalised.

Furthermore, the inadequacies of the consultation process to date are of particular concern when considered against the fact that the next opportunity for public participation in this phase of MSFD implementation (initial assessment, determination of GES and setting of environmental targets) is in six years.

The full range of consultation activities undertaken in the context of the Initial Assessment are provided in Figure 12.

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63 Ibidem.
64 Ibidem.
The COMMON SENSE project has received funding from the European Union’s Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.

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**Figure 12. Public consultation activities linked to the MSFD Initial Assessment in Ireland (Marine Institute and Department of Environment, Community and Local Government, 2013[^65])**

Reporting of GES, Targets and Initial Assessment for Descriptors

Within the Ireland’s Initial Assessment, the Competent Authority and supporting statutory agencies make reference to the existence of gaps in information, knowledge and scale at EU and Member State levels. Additionally, the Competent Authority acknowledge that within the Initial Assessment no attempt was made to judge the current status assessments for any of the Descriptors against achievement of GES because the metrics for doing so are largely still under development (Department of the Environment, Community and Local Government, 2014).

An independent review of Ireland’s Initial Assessment noted that a good level of consistency was evident between GES, the initial assessment and environmental targets for most descriptors. Similarly, Ireland has undertaken research to advance understanding of requirements for descriptors such as underwater noise and marine litter. However, negative aspects included a lack of systematic reporting on impacts arising from pressures in the marine environment, absence of targets for a number of descriptors, and use of GES definitions and targets that are not sufficiently clear or SMART to be measurable. The main findings of the review in relation to GES, Initial Assessment and Targets are provided in Table 5.

67 Ibidem.
68 Only Common Sense-related descriptors have been included in Table 5.
Table 5. Summary of review of Ireland’s Initial Assessment (modified from Dupont et al. 2014\textsuperscript{69}). Responses per Descriptor relating to assessment and criteria for the categories of GES, Initial Assessment and Targets are scored 0-4, where 0 = Not Reported, 1 = Adequate, 2 = Partially Adequate, 3 = Adequate, and 4 = Good Practice.

<table>
<thead>
<tr>
<th>GES</th>
<th>Initial Assessment</th>
<th>Targets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assess</td>
<td>Criteria</td>
<td>Assessment</td>
</tr>
<tr>
<td><strong>D5:</strong> Eutrophication</td>
<td>2</td>
<td>• Clear link to OSPAR and WFD methodologies</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• GES definition encompasses all the criteria of Commission’s Decision</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Nutrient concentrations are sole criterion for assessing the trophic status of offshore waters</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>• Clear link to OSPAR and WFD methodologies</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Reference made to EQS and OSPAR EAC and EcoQOs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• No mention of hierarchy between the two approaches</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• GES definition at descriptor level but incorporates the two criteria of Commission Decision</td>
</tr>
<tr>
<td><strong>D8:</strong> Contaminants</td>
<td>2</td>
<td>• Indicator for acute pollution events (8.2.2) not fully covered</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Reference made to EQS and OSPAR EAC and EcoQOs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• No mention of hierarchy between the two approaches</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• GES definition at descriptor level but impacts are</td>
</tr>
</tbody>
</table>

The COMMON SENSE project has received funding from the European Union’s Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.

| Litter | Addressed from a general perspective | • Small and micro plastics included within scope  
• No threshold value provided | • Use of OSPAR methodology cited  
• Information gaps and mitigation measures identified | • Potentially measurable but lack threshold values and baselines  
• Targets defined in accordance with Commission Decision but no targets for indicators 10.1.2 and 10.1.3 |
| --- | --- | --- | --- | --- |
| **D11**: Introduction of energy, including underwater noise | 2 | • Lack of threshold values and baselines  
• GES defined at descriptor and criteria levels  
• Scale at which GES should be assessed is provided  
• Lack of specificity regarding certain indicators | 3 | • Relevant data collected  
• Sources of underwater noise identified  
• Assessment of current level of pressure  
• No judgement made in relation to GES  
• Information gaps and mitigation measures identified | 0 |
5.3 Cooperation with other regions

Implementation of the MSFD will be facilitated and supported through existing institutional structures such as the Regional Sea Conventions; which are implemented by means of Decisions, Recommendations and Agreements. Decisions are binding and the recommendations establish actions to be developed by the Contracting Parties. These measures are complemented by agreements that tackle for example, other issues, monitoring programs, guidelines and methodological guides. Of the European Regional Sea Conventions, Ireland is member of OSPAR Convention which covers the North East Atlantic. Ireland has already commenced research into the use of OSPAR structures to support implementation of the MSFD, particularly in relation to linking OSPAR Ecological Quality Objectives (EcoQOs) to MSFD descriptors and indicators.  

The OSPAR Quality Status Report 2010, together with its underlying assessment reports, provided an important starting point for the Initial Assessment prepared for Ireland. Ireland is participating in various OSPAR working groups and committees and is represented through expert involvement from across the relevant Government Departments and State Agencies.

A key challenge for sub-regional coordination in this area is the number of jurisdictions with a complex range of political, administrative and management boundaries. Figure 13 refers to countries (and the Isle of Man which is a self-governing British Crown Dependency) which share boundaries in the Celtic Seas marine sub-region which includes Ireland. Although governed by British law, the Isle of Man (IOM) is not part of the UK or a direct member of the European Union and therefore not legally required to implement the MSFD in its marine waters. Based on coordination within OSPAR and the European Commission’s Common Implementation Strategy (CIS) for the MSFD, Ireland’s Government has reported no significant differences, problems or inconsistencies with the initial assessments being carried out in the UK and France.

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74 Under the MSFD, IOM is classed as a non-EU country or third country and the Directive calls on Member States to cooperate with third countries in the same region, making use ‘where practical and appropriate’ of the relevant regional pollution commission and other relevant regional bodies and agreements.

However, under the requirement of the Directive, cooperation is required between all Member States within a marine sub-region even if they do not share borders. While each Member State is responsible for developing a strategy specific to its own waters, each national strategy must be consistent with, and reflect the broader outlook of, the Marine Region of which it is part and thus contribute to the delivery of GES at three different scales; the national, the sub-regional (Celtic Seas) and the regional (North-East Atlantic).

Figure 13. Matrix of cooperation (indicated by shaded boxes) required under MSFD obligations across the seven jurisdictions in the Celtic Seas sub-region (Twomey and O’Mahony, 201376).

### 5.4 Monitoring

**MSFD Descriptor 5 Eutrophication (excessive nutrient input from human activities is minimised):**

Ecosystem indicators under Descriptor 5 Eutrophication link to existing and previous efforts under the OSPAR common procedure and the Water Framework Directive (WFD) monitoring for estuarine and coastal waters, which includes a Trophic Status Assessment Scheme (TSAS). Such undertakings are mainly conducted by the Environmental Protection Agency (EPA) and the Marine Institute (MI) (see Table 6).

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Table 6. MSFD Descriptor 5 and monitoring efforts for associated GES Indicators and OSPAR EcoQO in Ireland (adapted from Shephard et al., 2013)

<table>
<thead>
<tr>
<th>Descriptor</th>
<th>GES criteria</th>
<th>GES Indicator</th>
<th>OSPAR EcoQO</th>
<th>Monitoring in Ireland</th>
</tr>
</thead>
<tbody>
<tr>
<td>D5 Eutrophication</td>
<td>5.1 Nutrient level</td>
<td>5.1.1 Nutrient concentration</td>
<td>Eutrophication; Winter nutrients concentration in the water column</td>
<td>MI and EPA annual monitoring of trends and concentrations of winter nutrient levels in the Irish and Celtic Seas</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Problem and non-problem areas (63 subareas)</td>
<td>Common OSPAR procedure. The main data collection period was 2001–2005, with 63 subareas assessed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5.1.2 Nutrient ratios</td>
<td>Not linked to OSPAR EcoQO</td>
<td>Assessed as part of EPA TSAS monitoring under WFD for Irish Estuarine and Coastal waters</td>
</tr>
<tr>
<td>5.2 Direct effects</td>
<td></td>
<td>5.2.1 Chlorophyll concentration</td>
<td>Chlorophyll-a concentrations</td>
<td>Assessed as part of EPA TSAS monitoring under WFD for Irish Estuarine and Coastal waters and Irish Common Procedure report (OSPAR Commission, 2008)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5.2.2 Water Transparency</td>
<td>Not linked to OSPAR EcoQO</td>
<td>Annual monitoring of 191 transitional water body sites and 92 coastal sites under WFD monitoring programme by the EPA, including assessment of Transparency/Turbidity for the WFD Physio-Chemical Quality Element</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5.2.3 Abundance of opportunistic macro algae</td>
<td>Not linked to OSPAR EcoQO</td>
<td>Assessed as part of EPA TSAS monitoring under WFD for Irish Estuarine and Coastal waters</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5.2.4 Species shift</td>
<td>Phytoplankton Indicator species</td>
<td>Annual MI Phytoplankton monitoring programme</td>
</tr>
</tbody>
</table>

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5.3 Indirect Effect

<table>
<thead>
<tr>
<th>5.3.1 Abundance of perennial seaweeds and seagrasses</th>
<th>Not linked to OSPAR EcoQO</th>
<th>No Information available</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.3.2 Dissolved oxygen</td>
<td>Oxygen Concentration</td>
<td>Assessed as part of EPA TSAS monitoring under WFD for Irish Estuarine and Coastal waters</td>
</tr>
</tbody>
</table>

OSPAR Contracting Parties such as Ireland assess eutrophication under a common procedure targeted towards specific Ecological Quality Objectives (EcoQOs). Primary monitoring data used for the OSPAR assessment is derived from the EPA’s WFD Monitoring Programme for estuarine and coastal waters and the Marine Institute’s annual winter monitoring programme of coastal and offshore waters of the western Irish Sea and eastern Celtic Sea. In addition, seven coastal and offshore waters of the western Irish Sea and eastern Celtic Sea were subjected to an initial OSPAR screening procedure.\(^78\)

The EPA works in collaboration with the Marine Institute, Inland Fisheries Ireland and National Parks and Wildlife Service (NPWS) to monitor a total of 117 water bodies consisting of 82 transitional and 35 coastal water bodies under the WFD Monitoring Programme, which became operational on the 22 December 2006. Part of the monitoring programme is the TSAS for near shore and estuarine waters, which examines threshold values from three year periods, including for example, nitrogen and phosphorous under the nutrient enrichment category, chlorophyll and macro-algae under the accelerated growth category and dissolved oxygen under the undesirable disturbance category.\(^79\)

Winter nutrient sampling is carried out by the Marine Institute’s RV Celtic Voyager in January/February of each year, and in estuarine waters by the EPA. Surface seawater samples are collected from each station at a depth of 2–3 m using the on-board peristaltic pumping system. The conductivity, temperature, depth (CTD) probe are also deployed at designated stations.\(^80,81\)

Overall, Ireland is collating data for nearly all MSFD GES indicators under Descriptor 5 (see Table 6).

**MSFD Descriptor 8 Contaminants (levels do not give rise to pollution effects):** GES indicator 8.1.1 Concentration of contaminants under MSFD Descriptor 8 is currently not monitored in Ireland, while data collection is undertaken with relevance to indicator 8.2.1 Levels of pollution effects, and

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\(^{78}\) Ibidem.


\(^{80}\) Ibidem.

monitoring relating to indicator 8.2.2 Acute pollution events is happening through the UK and Ireland’s Seabird Monitoring Programme (SMP) (see Table 7).

Table 7. MSFD Descriptor 8 and monitoring efforts for associated GES Indicators and OSPAR EcoQO in Ireland (adapted from Shephard et al., 2013)

<table>
<thead>
<tr>
<th>Descriptor</th>
<th>GES criteria</th>
<th>GES Indicator</th>
<th>OSPAR EcoQO</th>
<th>Monitoring in Ireland</th>
</tr>
</thead>
<tbody>
<tr>
<td>D8 Contaminants</td>
<td>8.1 Concentration</td>
<td>8.1.1 Concentration of contaminants</td>
<td>The proportion of oiled common guillemots</td>
<td>Relevant OSPAR EcoQO is not implemented in Ireland but</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Contaminant concentrations in seabird eggs</td>
<td>Relevant OSPAR EcoQO is not implemented in Ireland</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Plastic particles in fulmar stomachs</td>
<td>Relevant OSPAR EcoQO is not implemented in Ireland</td>
</tr>
<tr>
<td>8.2 Effects</td>
<td>8.2.1 Levels of pollution effects</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Imosex in dogwhelks. CEMP monitoring programme</td>
<td>MI and University College Dublin (UCD) conducting on-going data collection and analysis in relation to the OSPAR EcoQO</td>
</tr>
<tr>
<td></td>
<td>8.2.2 Acute pollution events</td>
<td></td>
<td>Percentage of oiled seabirds</td>
<td>UK and Ireland’s Seabird Monitoring Programme (SMP)</td>
</tr>
</tbody>
</table>

GES indicator 8.1.1 Concentration of contaminants is not monitored in Ireland via existing monitoring of relevant OSPAR EcoQO (see Table 7); however, a number of seabird colonies (including Guillemot) are subject to varying levels of monitoring by the NPWS, for example, annual monitoring occurs at Great Skellig off the southwest coast, and five yearly surveys at Lambay Island off Dublin on Ireland’s east coast. The current data collection has the potential to be expanded to implement the OSPAR EcoQOs covering Proportion of oiled common guillemots and Contaminant concentrations in seabird eggs in Ireland, which are both applicable to GES Indicator 8.1.1.

The OSPAR EcoQO of Plastic particles in Fulmars is relevant to both Marine Litter and Contaminants aspects of the MSFD, and has been successfully monitored in the Netherlands by IMARES, who indicated that there is potential to extend such programmes to other OSPAR members, and which is presently underway in the UK. In relation to Ireland, IMARES have been in communication with the Department of Environment, Community and Local Government (competent authority for the MSFD

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in Ireland) to further the programme and conduct analysis on Irish fulmars, but these are not yet realised\textsuperscript{84}.

While GES indicator 8.1.1s for MSFD Descriptor 8 is not monitored in Ireland, there is potential to implement on-going activities under OSPAR in other Member States, such as Ireland, by: either expanding the existing monitoring programme (e.g. plastic particles in Fulmars); and, building upon current seabird monitoring efforts undertaken by the NPWS in Ireland to incorporate relevant OSPAR specific monitoring procedures that can subsequently be applied to MSFD GES indicators (e.g. the proportion of oiled common guillemots).

**MSFD Descriptor 10 Marine Litter**: Marine Litter is not monitored in Ireland in relation to the specific GES Indicators except for 10.1.1 beach litter trends (see Table 8).

\begin{table}[h]
\centering
\begin{tabular}{|c|c|c|c|c|}
\hline
Descriptor & GES criteria & GES Indicator & OSPAR EcoQO & Monitoring in Ireland \\
\hline
D10 – Litter & 10.1 Characteristics & 10.1.1 Beach litter trends & Litter on beach & Annual Coastwatch Surveys and pilot study “Monitoring of marine litter on beaches in the OSPAR Region” \\
\hline & & 10.1.2 Water column & Not linked to OSPAR EcoQO & No Information available \\
& & & & \\
& & & & \\
\hline & 10.1.3 Micro-particle trends & Not linked to OSPAR EcoQO & No Information available & \\
\hline
10.2 Impacts & 10.2.1 Animal ingestion & Plastic particles in fulmar stomachs & Relevant OSPAR EcoQO is not implemented in Ireland see previous section in relation for information & \\
\hline
\end{tabular}
\end{table}


Overall efforts to monitor Marine Litter in relation to MSFD GES indicator 10.1.1 are currently dependent on NGO volunteer contributions, for example via Coastwatch Ireland. In 2012, Coastwatch Ireland completed 480 survey units, each unit covering approximately 500m of shore length and involving approximately 800 volunteers; in 2013, this was expanded to 600 survey units and approximately 1000 volunteers (Coastwatch, 2012, 2013). The Coastwatch surveys take place annually and are conducted on an all-island basis.

Other initiatives and research projects in Ireland which relate to Marine Litter are predominantly focused on outreach, societal engagement and education aspects; for example, the MARLISCO - Marine Litter in European Seas - Social Awareness and Co-Responsibility project, which has the Coastal and Marine Research Centre as a partner representing Ireland, and An Taisce’s Clean Coast programme which promotes activities such as the annual Big Beach Clean undertaken in 2012 and 2013, an international coastal clean-up whereby volunteers record the location and length of beach cleaned and number of litter bags visible. All other GES indicators with relevance to Descriptor 10 are not monitored.

**MSFD Descriptor 11 Introduction of energy and underwater noise:** There is no dedicated monitoring programme in place in relation to Descriptor 11 GES indicators, however EPA research projects have been undertaken with the aim to establish a starting point and baseline in order to facilitate establishment of suitable monitoring programme (see Table 9).

**Table 9. MSFD Descriptor 11 and monitoring efforts for associated GES Indicators and OSPAR EcoQO in Ireland (adapted from Shephard et al., 2013)**

<table>
<thead>
<tr>
<th>Descriptor</th>
<th>GES criteria</th>
<th>GES Indicator</th>
<th>OSPAR EcoQO</th>
<th>Monitoring in Ireland</th>
</tr>
</thead>
<tbody>
<tr>
<td>D11 – Introduction of energy and underwater noise</td>
<td>11.1 Impulsive sounds</td>
<td>11.1.1 Proportion of days and their distribution</td>
<td>Not linked to OSPAR EcoQO</td>
<td>No current monitoring but EPA research projects to establish baseline</td>
</tr>
<tr>
<td></td>
<td>11.2 Continuous low frequency sound</td>
<td>11.2.1 Trends in the ambient noise level</td>
<td>Not linked to OSPAR EcoQO</td>
<td>No current monitoring but EPA research projects to establish baseline</td>
</tr>
</tbody>
</table>

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COMMON SENSE project has received funding from the European Union’s Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.
To date, nationally funded research in Ireland has established a baseline that furthers understanding of the descriptor and how to progress monitoring of GES 11.1.1 and 11.2.1\textsuperscript{91,92}. In addition, research into testing and operation of acoustic devises is underway in Ireland to advance and contribute to future monitoring programmes of MSFD Descriptor 11 GES indicators. For example, the Coastal and Marine Research Centre has received funding to test an acoustic device with the aim of establishing a data node which will contribute to imminent national monitoring efforts (Gerry Sutton, CMRC, pers. com). Furthermore, devices have been deployed for specific tasks such as noise monitoring related to ocean energy devices by Smartbay Ireland, a not-for-profit company established by the Marine Institute and the third level sector to manage Ireland’s marine Test and Demonstration facility in Galway Bay (see \url{www.smartbay.ie}). Similarly, the Galway-Mayo Institution of Technology (GMIT) installed a hydrophone off Tarbert Power Station jetty (west coast) to monitor underwater noise and bottlenose dolphin activity, this deployment was undertaken as part of the Listening to the Deep Ocean (LIDO) project, an international initiative which aims to monitor ocean noise (Shannon Wildlife and Dolphin Foundation, 2014\textsuperscript{93}).

6 IMPLEMENTATION OF MSFD IN POLAND

6.1 Transposition process

MSFD was transposed to the Polish legal system through the Water Law act\(^94\). The Water Law was developed back in 2001, and has been revised regularly during the recent years. It is the main legal act that implements the stipulations of MSFD into Polish legal and administrative frameworks, and it describes the steps and requirements needed to prepare marine strategy for the Polish marine waters. Polish marine strategy is defined as a set of activities with the overall aim to protect marine ecosystems of the Baltic Sea. Its preparation requires a sequence of actions that include:

1. preparation of an initial assessment of the marine waters;
2. determination of good environmental status (GES);
3. establishing measures and associated indicators to be used to achieve or to maintain GES;
4. preparation and implementation of the marine waters’ monitoring programme;
5. preparation and implementation of the national protection programme for marine waters.

The Water Law explicitly underlines the need for international cooperation during implementation of the MSFD, and the Helsinki Convention is named as a platform for such a collaboration. Apart from the Water Law, the MSFD is implemented through other legal acts. These legal acts include:

1. legal act on maritime areas of Poland and maritime administration (1991)\(^95\);
2. legal act on Inspection for Environmental Protection (1991)\(^96\);
3. Environmental Law (2001)\(^97\);
5. legal act on public access to information about the environment and its protection, public participation in environmental protection and environmental impact assessments (2004)\(^99\).

Two Polish environmental agencies – Chief Inspectorate of Environmental Protection\(^100\) and National Water Management Authority\(^101\) – are responsible for the directive implementation. Chief Inspectorate of Environmental Protection is a central government agency that is subordinated to the Ministry of the Environment. Its activities are not specifically focused on marine areas but on the protection of the environment both on land and in the water. Its major tasks\(^102\) include: (i) monitoring and supervision of activities and parties compliance with environmental regulations; (ii)}

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\(^94\) Ustawa prawo wodne (Dz.U. 2001 Nr 115 poz. 1229)
\(^95\) Ustawa o obszarach morskich Rzeczypospolitej Polskiej i administracji morskiej (Dz.U. 1991 nr 32 poz. 131)
\(^96\) Ustawa o Inspekcji Ochrony Środowiska (Dz.U. 1991 nr 77 poz. 335)
\(^97\) Prawo Ochrony Środowiska (Dz.U. 2001 nr 62 poz. 627)
\(^98\) Ustawa o ochronie przyrody (Dz.U. 2004 nr 92 poz. 880)
\(^99\) Ustawa o udostępnianiu informacji o środowisku i jego ochronie, udziale społeczeństwa w ochronie środowiska oraz o ocenach oddziaływania na środowisko (Dz.U. 2001 Nr 115 poz. 1229)
\(^100\) Główny Inspektorat Ochrony Środowiska.
\(^101\) Krajowy Zarząd Gospodarki Wodnej.
\(^102\) Information derived from: www.gios.gov.pl
investigating and analysing the state of the Polish environment through the National Environmental Monitoring; and, (iii) preventing major accidents that may affect the state of the environment. With regard to MSFD, this institution is responsible for: (i) preparation of the Initial Assessment (article 8 of MSFD); (ii) determination of good environmental status (article 9); and (iii) monitoring programmes (article 11).

National Water Management Authority is another central government agency that is subordinated to the Ministry of the Environment. Its major responsibilities include all issues related to conservation of water resources, water management and water use\(^\text{103}\). This agency is held accountable for establishing environmental targets (article 10), and for programmes of measures (article 13).

In addition, all steps that lead to the establishment of a marine strategy for Polish waters need to be coordinated with other ministries and with the general public. Table 10 presents these steps in the context of responsible organizations and required cooperation. Interestingly, the Polish maritime administration is not directly involved in the MSFD implementation. This is surprising as the maritime administration is entrusted with the overall management of marine areas\(^\text{104}\) in Poland, and this responsibility extends to nature conservation. In fact, the directors of the maritime offices are responsible for the preparation of management plans for marine NATURA 2000 areas. Other relevant responsibilities of maritime administration include\(^\text{105}\) (i) maritime safety and security, (ii) monitoring vessels traffic, (iii) issues concerning sea routes and harbours, (iv) protection of the marine environment, (v) construction, maintenance and protection of coastal enforcement, and (vi) maritime spatial planning.

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\(^{103}\) Information derived from: www.kzgw.gov.pl

\(^{104}\) The authority of maritime administration is based on the legal act on maritime areas of Poland and maritime administration (Dz.U. 1991 nr 32 poz. 131)

\(^{105}\) But are not limited to.
Table 10. Elements of Polish marine strategy in the context of required collaboration (according to the Water Law)

<table>
<thead>
<tr>
<th>Initial Assessment</th>
<th>Determination of GES</th>
<th>Environmental targets</th>
<th>Monitoring Programme</th>
<th>Measures (national protection programme for marine waters)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Responsible agency</td>
<td>Chief Inspectorate of Environmental Protection</td>
<td>Chief Inspectorate of Environmental Protection</td>
<td>National Water Management Authority</td>
<td>Chief Inspectorate of Environmental Protection</td>
</tr>
<tr>
<td>Implementation state</td>
<td>Prepared but not submitted to the European Commission</td>
<td>Prepared but not submitted to the European Commission</td>
<td>Not prepared</td>
<td>Prepared</td>
</tr>
</tbody>
</table>

108 Or at least not formally available. Formal release must be preceded by the submission of Initial Assessment to the European Commission.
<table>
<thead>
<tr>
<th>International cooperation</th>
<th>With Helsinki Commission to ensure that:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>[1] the methodology is coherent for the whole Baltic Sea region;</td>
</tr>
<tr>
<td></td>
<td>[2] transnational effects have been included and assessed;</td>
</tr>
<tr>
<td>Public consultations</td>
<td>Required and last 21 days; were performed in March 2013</td>
</tr>
<tr>
<td></td>
<td>Required and lasts 21 days; were performed in March 2013 in parallel with the consultations for the Initial Assessment</td>
</tr>
</tbody>
</table>

- Minister of Agriculture and Rural Development
- Minister responsible for public health (now Minister of Health)
- Minister responsible for public health (now Minister of Health)
- Minister of Agriculture and Rural Development
- Minister responsible for fishery and agriculture (now Minister of Agriculture and Rural Development)
- Minister responsible for public health (now Minister of Health)

Needs to ensure comparability and joint assessments at the level of the Baltic Sea, and –if possible – for all EU marine waters.

Required according to the legal act on public access to information about the environment and its protection, public participation in environmental protection and environmental impact assessment.

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110 Ustawa o udostępnianiu informacji o środowisku i jego ochronie, udziale społeczeństwa w ochronie środowiska oraz o ocenach oddziaływania na środowisko (Dz.U. 2001 Nr 115 poz. 1229).
### Revision process

<table>
<thead>
<tr>
<th>Revision process</th>
<th>Revision of the Initial Assessment:</th>
<th>Revision of the determination of GES:</th>
<th>Revision of environmental targets:</th>
<th>Revision of the monitoring programme:</th>
<th>Revision:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>[1] is held every six years or when needed;</td>
<td>[1] is held every six years or when needed;</td>
<td>[1] is held every six years or when needed;</td>
<td>[1] is held every six years or when needed;</td>
<td>[1] is held every six years or when needed;</td>
</tr>
<tr>
<td></td>
<td>[2] include all the information obligatory for the Initial Assessment;</td>
<td>[2] is communicated to European Commission, Helsinki Commission and relevant Member States;</td>
<td>[2] is communicated to European Commission, Helsinki Commission and relevant Member States;</td>
<td>[2] is communicated to European Commission, Helsinki Commission and relevant Member States;</td>
<td>[2] is communicated to European Commission, Helsinki Commission and relevant Member States;</td>
</tr>
<tr>
<td></td>
<td>[3] include the summary of all changes and the results of marine monitoring undertaken;</td>
<td>[3] include the summary of all changes and the results of marine monitoring undertaken;</td>
<td>[3] include the summary of all changes and the results of marine monitoring undertaken;</td>
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</tr>
</tbody>
</table>

The COMMON SENSE project has received funding from the European Union’s Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.
The Chief Inspectorate of Environmental Protection is formally responsible for preparation of three out of four documents leading to the Polish marine strategy, but in fact the preparation of these documents is often entrusted (or subcontracted) to external organizations. The Initial Assessment was prepared by a team of researchers from the Institute of Meteorology and Water Management – National Research Institute, Maritime Branch in Gdynia. However, the Initial Assessment explicitly mentions three other institutions. These institutions prepared thematic reports, and parts of the Initial Assessment were prepared on the basis of these reports. These institutions include: (i) Maritime Institute in Gdansk; (ii) National Marine Fisheries Research Institute; and (iii) the Polish Society for the Protection of Birds. The first two organizations are research institutes, while the Polish Society for the Protection of Birds is an environmental NGO. Determination of GES was prepared by the same group of institutions, apart from the Polish Society for the Protection of Birds. The authorship of the monitoring programme is not clearly explained.

6.2 Cooperation with other regions

Poland is a member of HELCOM (Baltic Marine Environment Protection Commission, also known as Helsinki Commission). The Commission is an intergovernmental organization governing the Convention on the Protection of the Marine Environment of the Baltic Sea Area (Helsinki Convention). HELCOM has 10 Contracting Parties, which representatives meet annually. The Heads of Delegation meet at least twice a year and ministerial level meetings are held occasionally. Head of Polish Delegation is Mr. Andrzej Jagusiewicz from the Chief Inspectorate of Environmental Protection (GIOŚ), where the Polish Secretariat of HELCOM is located.

The Commission adopts Recommendations for the protection of the marine environment, decides on the budget and makes other important decisions. Decisions are made by consensus. HELCOM covers the whole of the Baltic Sea area, including inland waters as well as the water of the sea itself and the sea-bed. Measures are also taken in the whole catchment area of the Baltic Sea to reduce land-based pollution.

HELCOM’s six main groups and three fora implement policies and strategies, and propose issues for discussion at the meetings of the Heads of Delegations, where decisions are made. The six main groups and the issues they tackle are:

1. Group for Implementation of the Ecosystem Approach (GEAR)
2. The Nature Protection and Biodiversity Group (HABITAT)

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111 Instytut Meteorologii i Gospodarki Morskiej - Państwowy Instytut Badawczy, Oddział Morski w Gdyni, www.imgw.pl/
112 Instytut Morski w Gdansku, http://www.en.im.gda.pl
115 http://helcom.fi/

The COMMON SENSE project has received funding from the European Union’s Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.
3. The Land-based Pollution Group (LAND)
4. The Maritime Group (MARITIME)
5. The Monitoring and Assessment Group (MONAS)
6. The Response Group (RESPONSE)

Three platforms for dialogue:

1. HELCOM Agriculture and Environment Forum (AGRI/ENV FORUM)
2. HELCOM Fisheries and Environment Forum (FISH/ENV FORUM) Joint HELCOM-VASAB

Polish entities cooperating in the framework of the HELCOM working groups116:

1. **GEAR**
   i. Chief Inspectorate of Environmental Protection;

2. **HABITAT**
   i. General Directorate for Environmental Protection (Generalna Dyrekcja Ochrony Środowiska);
   ii. Ministry of Agriculture and Rural Development (Ministerstwo Rolnictwa i Rozwoju Wsi);
   iii. Ministry of Infrastructure and Development (Ministerstwo Infrastruktury i Rozwoju);
   iv. Maritime Offices;
   v. National Marine Fisheries Research Institute in Poland (MIR-PIB – Morski Instytut Rybacki - Państwowy Instytut Badawczy);
   vi. University of Gdansk;
   vii. Maritime Institute in Gdansk (IM - Instytut Morski w Gdansku);

3. **LAND**
   i. Ministry of Economy (Ministerstwo Gospodarki);
   ii. National Water Management Authority (Krajowy Zarząd Gospodarki Wodnej);
   iii. Ministry of Agriculture and Rural Development (Ministerstwo Rolnictwa i Rozwoju Wsi);
   iv. Ministry of Environment (Ministerstwo Środowiska);
   v. Ministry of Infrastructure and Development (Ministerstwo Infrastruktury i Rozwoju);
   vi. Department of Monitoring and Environmental Information, Chief Inspectorate of Environmental Protection (GIOS);

4. **MARITIME**
   i. Ministry of Infrastructure and Development (Ministerstwo Infrastruktury i Rozwoju);

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5. MONAS
   i. Department of Monitoring and Environmental Information, Chief Inspectorate of Environmental Protection (GIOŚ);
   ii. Institute of Meteorology and Water Management – National Research Institute (IMGW-PIB – Instytut Meteorologii i Gospodarki Morskiej - Państwowy Instytut Badawczy);
   iii. Institute of Oceanology, Polish Academy of Sciences (IO PAN – Instytut Oceanologii Polskiej Akademii Nauk);
   iv. Central Laboratory for Radiological Protection in Warsaw (Centralne Laboratorium Ochrony Radiologicznej w Warszawie);
   v. Voivodship Inspectorate of Environmental Protection in Szczecin (WIOŚ - Wojewódzki Inspektorat Ochrony Środowiska w Szczecinie);
   vi. Voivodship Inspectorate of Environmental Protection in Gdansk (WIOŚ - Wojewódzki Inspektorat Ochrony Środowiska w Gdansku);
   vii. Maritime Institute in Gdansk (IM - Instytut Morski w Gdansku);
   viii. National Marine Fisheries Research Institute in Poland (MIR-PIB – Morski Instytut Rybacki - Państwowy Instytut Badawczy);
   ix. National Veterinary Research Institute in Puławy (Państwowy Instytut Weterynarii w Puławach);

6. RESPONSE
   i. Ministry of Infrastructure and Development (Ministerstwo Infrastruktury i Rozwoju).

Polish entities cooperating in the framework of the HELCOM platforms for dialogue\(^\text{117}\):

1. HELCOM AGRI/ENV FORUM
   i. Ministry of Agriculture and Rural Development (Ministerstwo Rolnictwa i Rozwoju Wsi);
   ii. Ministry of Environment (Ministerstwo Środowiska);

2. HELCOM FISH/ENV FORUM
   i. Ministry of Agriculture and Rural Development (Ministerstwo Rolnictwa i Rozwoju Wsi);
   ii. General Directorate for Environmental Protection (Generalna Dyrekcja Ochrony Środowiska);

3. Joint HELCOM-VASAB WG on MSP
   i. General Directorate for Environmental Protection (Generalna Dyrekcja Ochrony Środowiska);
   ii. Maritime Office in Gdynia.

Regional cooperation is organised mainly through existing cooperation platform in the framework of HELCOM. In addition, Poland as a member of EU is obliged to fulfil requirements of MSFD and WFD. HELCOM also functions as a coordination platform for the implementation of the MSFD in the Baltic Sea region and cooperates closely with the OSPAR Commission which mission is to protect the marine environment of the North-East Atlantic. The objective of the MSFD to reach GES for marine waters by 2020 through marine strategies which apply the ecosystem-based approach is very much in line with the objectives and approaches for both HELCOM and OSPAR. In 2007 the HELCOM Baltic Sea Action Plan (BSAP) was adopted\(^{118}\), with 4 areas of priority: (i) **Eutrophication** - towards a Baltic Sea unaffected by eutrophication; (ii) **Hazardous substances** – towards a Baltic Sea with life undisturbed by hazardous substances; (iii) **Biodiversity** – towards a favourable conservation status of Baltic Sea biodiversity; and, (iv) Towards a Baltic Sea with maritime activities carried out in an environmental friendly way, all countries are now implementing the actions), to restore the good ecological status of the Baltic marine environment by 2021.

The Polish experts participated actively in all working groups and in the related subgroups connected to MSFD. Especially, a list of indicators and GES characteristics for descriptors D1, 2, 4, 6, 8 and 9 were main tasks for the experts. Work on D3 was conducted in cooperation with ICES experts and an EC workshop.

**Concerning D5 (Eutrophication):**

1. Results of the HELCOM projects and working groups, e.g.: COMBINE, PLC, EMEP, HOLAS, MONAS, have been implemented in Polish monitoring programmes and used for preparation of Initial Assessment and GES characteristics.

2. Implementation of the BSAP includes, for example: (i) designation of areas vulnerable to nitrates of agricultural origin and implementation of action plans within these areas, (ii) prevention and limitation of pollution by land sources of agricultural activity, including the implementation of good agricultural practice, (iii) reduction of discharges from urban and home wastewater treatment plants, (iv) inclusion of adequate measures in national water and environmental programmes, updating of river basin management plans and conditions of use of water regions and water catchment areas, drawn up in accordance with the Water Law Act, transposing the requirements of the WFD, (v) measures to decrease loads of nutrients from atmospheric deposition by reducing the emissions of nitrogen compounds from the respective sectors, including marine transport.

3. Limits on the content of phosphates and other phosphorus compounds in consumer laundry detergents have been implemented since 30 June 2013 (EU Regulation 259/2012\(^{119}\)).


The COMMON SENSE project has received funding from the European Union’s Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.
4. Limits on the content of phosphates and other phosphorus compounds in consumer automatic dishwasher detergents should be implemented from 1 January 2017 (EU Regulation 259/2012120).

5. Joint Polish-Finnish samplings in the vicinity of the Wiślinka and Police phosphogypsum dumpsites in July 2013 were a follow-up to the implementation of requirements of HELCOM Recommendation 17/6121.


Concerning D8 (Contaminants and pollution effects):

1. Results of the HELCOM projects and working groups, e.g.: CORESET, COHIBA, HOLAS, MORE, MONAS, MUNI, have been implemented in Polish monitoring programmes and used for preparation of Initial Assessment and GES characteristics.

2. Implementation of the BSAP includes, for example: (i) reduction and prevention of emissions of dioxins and other hazardous substances from small-scale combustion, (ii) implementation of HELCOM Requirements concerning proper handling of waste/landfilling, (iii) promotion of the Strategic Approach on International Chemicals Management and participation in the regional implementation process, (iv) application of restrictions on the use of specific substances (PFOS, NP/NPE, SCCP), (v) assessment of the possibility and introduction of restrictions for cadmium content in mineral fertilizers, (vi) application of strict restrictions on the use of mercury in products and processes.

Concerning D10 (Marine litter):

1. Results of the projects/programmes/working groups, e.g.: HELCOM MORE, MEDPOL, MSFD GES TSG-ML, have been implemented in Polish monitoring programmes and used for preparation of Initial Assessment and GES characteristics.

2. The Ghost Net Removal project is implemented by Polish WWF and follow-up activities are planned by Polish WWF together with Lithuanian Fund for Nature.

3. There is project under the 7th Research Framework Programme supporting scientific understanding of marine litter – MARLISCO (MARine Litter in European Seas: Social AwareneS and CO-Responsibility (2012-2015) in which HELCOM is represented through Polish and German experts.


The COMMON SENSE project has received funding from the European Union’s Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.
4. The BSAP includes an agreement to raise awareness of the negative environmental and economic effects of marine litter in the marine environment, including effects of “ghost fishing” of lost or discarded fishing gear. The BSAP also encourages projects by local governments and communities to remove litter from the coastal and marine environment, such as beach clean-up operations, “Fishing for Litter” initiatives and local litter campaigns.

Concerning D11 (Underwater noise):

1. Polish scientists are partners in the BIAS LIFE+ project, which targets is the management of human-introduced underwater noise in the Baltic region.
2. In plans of the Polish noise monitoring programs the instructions contained in the Monitoring Guidance for Underwater Noise in European Seas, have been used for preparation of Initial Assessment and GES characteristics.

6.3 Pressures and impacts

Coastal and marine ecosystems are subject to a number of human-induced pressures associated with a variety of marine activities and developments. The Initial Assessment prepared by GIOŚ contains an evaluation of pressures and impacts between human activities and marine ecosystems for the Polish zone of the Baltic Sea.\(^{(122)}\)

Analysis of pressure shows that the following sectors of the Polish economy have important impact on the marine environment: maritime shipping; seaports; shipbuilding industry; agriculture and, mining industry.

6.3.1 Physical loss

The most important source of physical losses in the Polish Marine Areas is disposal of dredge spoil and exploitation of aggregates. These activities cause the presence of underwater noise and disturbance of the seabed in the area of their deposition.

According to the recommendations of HELCOM, every year, Poland prepares a report concerning the quantity of dredge spoil and the content of hazardous substances in the deposited material. Disposal of dredge spoil is carried out by permits issued in accordance with regulation of the Minister of Infrastructure. According to the current evaluation, the amount of introduced pollution is in the normal range and the content of hazardous substances in the marine environment is not exceeded.

6.3.2 Physical damage

The main element causing physical damage within Polish Marine Areas is port infrastructure and activities related to the protection of the coast. However, the existing port infrastructure does not

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The COMMON SENSE project has received funding from the European Union’s Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.
include a significant percentage of the coastline and its impacts can be considered as local. Nevertheless, port infrastructure can significantly influence the processes of transport and sedimentation along the shore. Another problem is the construction development along the shore related to its protection against waves and currents.

6.3.3 Other physical disturbance

Underwater noise

The U.S. Commission on Ocean Policy (USCOP) report, has warned policymakers and the public about the decreasing health of marine animals on the World scale. Similarly, the European Marine Strategy Framework Directive (MSFD; European Parliament and the Council of the European Union (2008)) has addressed the need to monitor noise pollution and has included noise as one of descriptors of good environmental status of the seas and oceans. Marine animals at all trophy levels are exposed to a variety of potentially stressogenic effects of the anthropogenic noise. The main detrimental effects include – disabling hearing abilities, changing of behavior, increasing level of stress hormone, and even alteration of gene expression in brain of fishes, as examples. However, the extents of the damages done by various factors in different group of organisms are not fully comprehended.

In Poland there is no current monitoring of underwater noise in marine waters, thus the description of the status of the marine environment for this descriptor is very difficult. Shipping is an important source of underwater noise; it has been estimated that there are from 1800 to 2000 ships at sea in the Baltic at any given time. Analysis of underwater noise generated by shipping was based on the number of vessels calling at the main Polish ports in the years 2008-2011. The most frequented Polish ports are Gdynia, Gdansk, Szczecin and Świnoujście. Since September 2012, the Institute of Oceanography (including the Marine Station) of the University of Gdansk has been implementing the Polish part of the project: ‘Baltic Sea Information on Acoustic Soundscape’, main objective of which is to provide a pilot implementation study on underwater noise as per descriptor 11 at regional level in the Baltic Sea.

Marine litter

The main source of litter in the marine environment is human activity. Litter is washed, picked up by the wind or thrown into the water directly from the coast. Some litter also comes from shipping and mining activity carried out at sea. Populations living in coastal areas and tourists are major sources of litter deposited on the coast. Data on only one of the four MSFD core indicators for marine litter, i.e. litter deposited on coastlines, are currently available for Poland. Another problem is litter deposited on the seafloor, including ghost nets.

6.3.4 Interference with hydrological processes

On the basis of expert evaluation and due to lack of relevant monitoring data, it can be concluded that there are no interferences of the hydrological processes affecting the overall assessment of the
environmental status of waters in the Polish Marine Areas. Changes in temperature or salinity caused by anthropogenic factors occur only locally.

The water discharges from sewage treatment plants (e.g. in Gdansk and Dębogórze) or leaching of underground salt caverns (collector INVESTGAS) are carried out in accordance with permits, and their impact is limited.

6.3.5 Contamination by hazardous substances

Contaminants are also defined as hazardous substances because of their potential toxic effects. Three major groups of contaminants are persistent organic pollutants, heavy metals and radionuclides.

Persistent organic pollutants

Monitoring of persistent organic pollutants in the Polish economic zone within the Baltic Sea includes determination of concentrations of organochlorine pesticides (DDT and its metabolites, isomers of HCH, HCB) and polychlorinated biphenyls (seven sentinel PCBs: 28, 52, 101, 118, 138, 153, 180, according to IUPAC). Studies are focused on different matrices, including fish, molluscs and sediments.

Organochlorine pesticides have been mainly used as insecticides and herbicides. Serious threat to the environment is currently posed by:

1. emission of by-products generated during industrial production of organochlorine compounds;
2. landfill sites of waste derived from manufacturing of plant protection products;
3. landfills of outdated pesticides (concrete containers, tombs, ground ditches).

Major sources of persistent organic pollutants to the Baltic Sea involve: rivers (18 %), atmospheric deposition (47 %), direct discharges of waste water (21 %), inflow from the North Sea (14 %).

Heavy metals

Heavy metals are discharged into the Baltic Sea mainly through rivers and atmosphere. Heavy metals introduced into the environment by human activities enter the oceans and seas, where they undergo biochemical changes and ultimately are subject to accumulation in bottom sediments.

Radionuclides

The level of artificial radioactivity in the Baltic Sea results mainly from the presence of cesium (Cs-37) and strontium (Sr-90) radioactive isotopes. Cs-137 and Sr-90 radionuclides were dominant in the marine environment both before the Chernobyl nuclear accident, which took place in 1986, as now. The Baltic Sea is still considered as the most contaminated area, taking into account the Cs-137 concentration characteristic of its waters.
Chemical warfare

In the area of the Polish economic zone of the Baltic Sea, there are several wrecks containing conventional ammunitions and places where unwanted chemical ammunition was disposed. The degree of corrosion of the ammunition is largely unknown. There is still some information on fishermen who caught missiles, torpedoes and other items containing unidentified substances.

6.3.6 Nutrient and organic matter enrichment

Nutrients enter the Baltic Sea mainly from external sources:

1. surface runoff, mostly from agriculture (mineral fertilizers and manure);
2. evaporation of ammonia from manure;
3. municipal wastewater (cleaned and uncleaned);
4. industry;
5. rainwater;
6. atmospheric deposition (burning).

In the case of the Baltic Sea, impact on eutrophication also have internal sources: the assimilation of nitrogen and phosphorus from bottom waters of stagnant basins, which are difficult to estimate.

6.3.7 Biological disturbance

The main elements causing biological disturbances within Polish Marine Areas are:

1. introduction of microbial pathogens;
2. introduction of alien species;
3. seafishing of commercial species (cod, sprat, herring, flatfish and salmonids);
4. marine recreational fishing (cod);
5. incidental catches of non-commercial species;
6. by-catch of marine mammals and birds in fishing nets.

6.4 An introduction to the Initial Assessment

Initial Assessment (IA) of environmental state in Polish zone of the Baltic Sea has been coordinated by Chief Inspectorate of Environmental Protection in Poland, Department of Monitoring and Environmental Information (GIOŚ - Główny Inspektorat Ochrony Środowiska, Departament Monitoringu i Informacji o Środowisku). The Initial Assessment has been compiled based on data provided by:

1. Institute of Meteorology and Water Management – National Research Institute, Maritime Branch in Gdynia (IMGW-PIB - Instytut Meteorologii i Gospodarki Morskiej - Państwowy Instytut Badawczy, Oddział Morski w Gdyni);
2. Maritime Institute in Gdansk (IM - Instytut Morski w Gdansku);

The Initial Assessment is currently available on the web page of Polish Ministry of the Environment, as a project of the IA (Report addressed to the European Union), waiting for official acceptance.\textsuperscript{123}

There was also prepared earlier ‘Assessment of state of the marine environment of Polish economic Baltic zone on the basis of the monitoring data from the year 2012 on the background of the data from the period 2001-2011’, grant by GIOŚ, Warsaw (242 pp), authors of Voivodship Inspectorate of Environmental Protection (WIOŚ) in Szczecin, WIOŚ in Olsztyn - Branch in Elbląg, IMGW-PIB, Marine Branch in Gdynia, according to demands of EU WFD.\textsuperscript{124}

The Initial Assessment concerns 11 descriptors, divided between state-based descriptors (D1 - Biodiversity, D3 - Commercial fish and shellfish, D4 - Food webs, D6 - Sea-floor integrity) and pressure-based descriptors (D2 - Non-indigenous species, D5 - Eutrophication, D7 - Hydrographical conditions, D8 - Contaminants and pollution effects, D9 - Contaminants in fish and other seafood, D10 - Marine litter, D11 - Energy including underwater noise). Assessment was based on 46 core indicators designated to descriptors, 40 of them are associated with Descriptors: 5, 8, 10 and 11 (Table 11).

\textsuperscript{123} Wstępna ocena stanu środowiska wód morskich polskiej strefy Morza Bałtyckiego, Raport do Komisji Europejskiej, April 2014, 463 pp., http://www.mos.gov.pl/g2/big/2014_04/9c66a1f48a2859a0948a0931c57f7ce9.pdf

Table 11. List of core indicators used to Initial Assessment of environmental state in Polish zone of the Baltic Sea

<table>
<thead>
<tr>
<th>No.</th>
<th>Core indicators ↓</th>
<th>Descriptors →</th>
<th>State-based descriptors</th>
<th>Pressure-based descriptors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>D1</td>
<td>D3</td>
</tr>
<tr>
<td>1</td>
<td>White-tailed eagle productivity</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>2</td>
<td>Abundance of wintering populations of seabirds</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Large Fish Index (1) – open waters (LFI 1)</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Multimetric macrozoobenthic indices B</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>5</td>
<td>Ratio of perennials to total macrophyte biomass (SMₗ)</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>6</td>
<td>Trends in arrival of new non-indigenous species</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>DIN – mean winter (I-III) concentration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>DIN – mean annual concentration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>TN - mean summer (VI-IX) concentration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>TN - mean annual concentration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>DIP – mean winter (I-III) concentration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>DIP – mean annual concentration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>TP - mean summer (VI-IX) concentration</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The COMMON SENSE project has received funding from the European Union’s Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.
<p>| 14 | TP - mean annual concentration |   | X |
| 15 | Chlorophyll-a – mean summer (VI-IX) concentration |   | X |
| 16 | Chlorophyll-a – mean annual concentration |   | X |
| 17 | Water transparency in summer (VI-IX) |   | X |
| 18 | Water transparency – mean annual |   | X |
| 19 | Oxygen in near-bottom water - minimal summer (VI-IX) content |   | X |
| 20 | Seafloor surface permanently affected by hydromorphological alternations |   | X |
| 21 | Polybrominated diphenyl ethers (PBDEs) - organisms |   | X | X |
| 22 | Hexabromocyclododecane (HBCDD) - organisms |   | X |
| 23 | Perfluorooctane sulphonate (PFOS) - organisms |   | X |
| 24 | Dioxins and furans - fishes |   | X |
| 25 | Dioxins, furans and dioxin-like polychlorinated biphenyls: 2,3,7,8 TCDD TEQ+dl_PCB |   | X | X |
| 26 | Dioxins, furans and dioxin-like polychlorinated biphenyls: 2,3,7,8 TCDD TEQ+dl_PCB +7PCBs – organisms; 7PCBs - sediments |   | X |
| 27 | Sum of 7 polychlorinated biphenyls: 7 PCBs - fishes |   | X |
| 28 | Sum of 7 polychlorinated biphenyls: 7 PCBs - mussels |   | X |
| 29 | Sum of 7 polychlorinated biphenyls: 7 PCBs - sediments |   | X |</p>
<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th></th>
<th></th>
<th>X</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>Sum of 6 polychlorinated biphenyls: 6 PCBs (28, 52, 101, 118, 138, 153) - fishes</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>31</td>
<td>Polycyclic aromatic hydrocarbons (PAHs) and metabolites of polycyclic aromatic hydrocarbons (16) - organisms</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>32</td>
<td>Polycyclic aromatic hydrocarbons (PAHs) and metabolites of polycyclic aromatic hydrocarbons (16) - sediments</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>33</td>
<td>Mercury (Hg) - fishes</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>Mercury (Hg) - mussels</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>Mercury (Hg) - sediments</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>Cadmium (Cd) - fishes</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>37</td>
<td>Cadmium (Cd) - mussels</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>Cadmium (Cd) - sediments</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>39</td>
<td>Lead (Pb) - fishes</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>Lead (Pb) - mussels</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>41</td>
<td>Lead (Pb) - sediments</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>42</td>
<td>Cesium-137 - fishes</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>43</td>
<td>Cesium-137 - water</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>44</td>
<td>Tributyltin compounds (TBT) – organisms</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>45</td>
<td>Litter/wastes deposited on coastline</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>46</td>
<td>Underwater noise</td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
6.5 Good Environmental Status

Results of the Initial Assessment, based on individual 11 descriptors, are:

1. characteristics of Good Environmental Status for each descriptor
2. classification – GES is achieved (GES) or not (subGES).

Taking into account a five-point scale of environmental status (according to the WFD: high, good, moderate, poor and bad), it was assumed that threshold GES/subGES corresponds with determination of the threshold between “high and good” status and “bad, poor, and moderate” status.

Descriptor 5: Eutrophication

“Human-induced eutrophication is minimized, especially adverse effects thereof, such as losses in biodiversity, ecosystem degradation, harmful algae blooms and oxygen deficiency in bottom waters”

Eutrophication is one of the most important problems of the Baltic Sea, so for 40 years (i.e. since signing the first Helsinki Convention in 1974) different parameters connected with causes of eutrophication (like nutrient concentrations) and results of over nourishing (like chlorophyll a, turbidity, oxygen content and others) as well as loads of nutrients carried out by rivers of the Baltic catchment area have been monitored. It is included in the BSAP (Baltic Sea Action Plan), HEAT (HELCOM Eutrophication Assessment Tool) and different projects aimed to particular environmental problems of the Baltic. There are many meetings of working groups organized by HELCOM concerning eutrophication matters and other environmental problems. Poland, due to high population (49% of the Baltic catchment area lives in Poland) and large agricultural areas (ca 50% of the agriculture land of the Baltic catchment area is in Poland), has a great influence on eutrophication in the Baltic.

Descriptor 5 is described using three criteria and associated numerous core indicators. Fifteen core indicators were selected due to the data availability. GIOŚ in Poland (Chief Inspectorate of Environmental Protection) additionally recommends five more core indicators as being important to
the full assessment of environmental status: nutrient ratios (N:P; N:P:Si); phytoplankton biomass; toxic phytoplankton species; and, phytoplankton taxonomic indices.

Table 12. Criteria and indicators for GES of marine waters relevant to D5

<table>
<thead>
<tr>
<th>Criteria and indicators for GES of marine waters relevant to D5</th>
<th>Core indicators</th>
<th>Characteristics for GES of marine waters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Criterion 5.1. Nutrients levels</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indicator 5.1.1 Nutrients concentration in the water column</td>
<td></td>
<td>DIN – mean winter (I-III) concentration*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DIN – mean annual concentration*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TN - mean summer (VI-IX) concentration*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TN - mean annual concentration*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DIP – mean winter (I-III) concentration*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DIP – mean annual concentration*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TP - mean summer (VI-IX) concentration*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TP - mean annual concentration*</td>
</tr>
<tr>
<td>Indicator 5.1.2 Nutrient ratios (silica, nitrogen and phosphorus), where appropriate</td>
<td>N:P**</td>
<td>currently not included in the marine water classification</td>
</tr>
<tr>
<td></td>
<td>N:P:Si**</td>
<td></td>
</tr>
<tr>
<td>Criterion 5.2. Direct effects of nutrient enrichment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.2.1 Chlorophyll concentration in the water column</td>
<td></td>
<td>Chlorophyll-a – mean summer (VI-IX) concentration*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chlorophyll-a – mean annual concentration*</td>
</tr>
<tr>
<td>5.2.2 Water transparency related to increase in suspended algae, where relevant</td>
<td>Water transparency in summer (VI-IX)*</td>
<td>Water transparency – mean annual*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Phytoplankton biomass**</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gdansk Deep (P1) &gt; 9.22</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SE Gotland Basin (P140) &gt; 8.38</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bornholm Deep (P5) &gt; 11.5</td>
</tr>
<tr>
<td>5.2.3</td>
<td>Abundance of opportunistic macroalgae</td>
<td>Ratio of perennials to total macrophyte biomass SM₁*</td>
</tr>
<tr>
<td>-------</td>
<td>--------------------------------------</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>5.2.4</td>
<td>Species shift in floristic composition such as diatom to flagellate ratio, benthic to pelagic shifts, as well as bloom events of nuisance/toxic algal blooms (e.g. cyanobacteria) caused by human activities</td>
<td>Toxic phytoplankton species**</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Phytoplankton taxonomic indices**</td>
</tr>
</tbody>
</table>

5.2.3 Indirect effects of nutrient enrichment

<table>
<thead>
<tr>
<th>5.3.1</th>
<th>Increase of macroalgal biomass e.g filamentous</th>
<th>Macrophyta indices</th>
<th>currently not included in the marine water classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.3.2</td>
<td>Abundance of perennial seaweeds and seagrasses (e.g. fucoids, eelgrass and Neptune grass) adversely impacted by decrease in water transparency</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.3.3</td>
<td>Dissolved oxygen, i.e. changes due to increased organic matter decomposition and size of the area concerned</td>
<td>Oxygen in near-bottom water - minimal summer (VI-IX) content*</td>
<td>Gdansk Deep (P1) &gt; 4.20 SE Gotland Basin (P140) &gt; 4.20 Bornholm Deep (P5) &gt; 4.20</td>
</tr>
<tr>
<td>5.3.4</td>
<td>State of benthic macroinvertebrates</td>
<td>Multimetric macrozoobenthic indices B*</td>
<td>≥ 3.8</td>
</tr>
</tbody>
</table>

* selected for Initial Assessment
** recommended by GIOŚ in Poland

Table according to “Zestaw właściwości typowych dla dobrego stanu środowiska wód morskich”, Report addressed to the European Commission. It was assumed that threshold of good environment status (GES) for all eutrophication indicators is the value between good and moderate ecological status, provided in the WFD (in accordance with att. 3 of Regulation of the Polish Minister of the Environment (Dz.U. Nr 257, poz 1545). Initial Assessment for Descriptor 5, for Polish zone of the Baltic Sea, based on the MSFD, was determined as subGES (according to “Wstępna ocena stanu środowiska wód morskich polskiej strefy Morza Bałtyckiego”, Report addressed to the European Commission).

126 Rozporządzenie Ministra Środowiska z dnia 9 listopada 2011 r. w sprawie sposobu klasyfikacji stanu jednolitych części wód powierzchniowych oraz środowiskowych norm jakości dla substancji priorytetowych, Dz.U. 2011 nr 257 poz. 1545.

The COMMON SENSE project has received funding from the European Union’s Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.
Descriptor 8: Contaminants and Pollution Effects

“Contaminants are at a level not giving rise to pollution effects”

Descriptor 8 contains two criteria. First of them (8.1) includes list of identified substances which is based on a list of indicators considered as essential for the assessment of the state of the Baltic Sea environment. This list of indicators is a result of work on the HELCOM CORESET project (recommended for the Baltic Sea) and seems to be the most appropriate list for assessing the state of the Baltic Sea and the possible implementation of monitoring programs. The selected substances are also included in: the Stockholm Convention list of priority hazardous substances and/or the WFD and/or the HELCOM recommendations (including Baltic Sea Action Plan, BSAP128) and the report of the MSFD Working Group regarding pollutants129. The second criterion (8.2) includes four basic indicators for the assessment of biological effects, which have been proposed in the HELCOM CORESET project.

Table 13. Criteria and indicators for GES of marine waters relevant to D8

<table>
<thead>
<tr>
<th>Criteria and indicators for GES of marine waters relevant to D8</th>
<th>Group of core indicators</th>
<th>Core indicators</th>
<th>Characteristics for GES of marine waters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Criterion 8.1 Concentrations of contaminants</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indicator 8.1.1 Concentrations of contaminants measured in relevant matrix (biota, sediment and water)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Polybrominated diphenyl ethers</td>
<td>Polybrominated diphenyl ethers (PBDEs)</td>
<td>Contamination ratio must be less than 1</td>
<td></td>
</tr>
<tr>
<td>Hexabromocyclo-dodecane</td>
<td>Hexabromocyclo-dodecane (HBCDD)</td>
<td>Contamination ratio must be less than 1</td>
<td></td>
</tr>
<tr>
<td>Perfluorooctane sulphonate</td>
<td>Perfluorooctane sulphonate (PFOS)</td>
<td>Contamination ratio must be less than 1</td>
<td></td>
</tr>
<tr>
<td>Dioxins, furans and dioxin-like polychlorinated biphenyls</td>
<td>Dioxins 2,3,7,8 TCDD TEQ + dl_PCB + 7PCBs</td>
<td>Contamination ratio must be less than 1</td>
<td></td>
</tr>
</tbody>
</table>


The COMMON SENSE project has received funding from the European Union’s Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.
<table>
<thead>
<tr>
<th>Category</th>
<th>Compounds</th>
<th>Contamination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polycyclic aromatic hydrocarbons (PAHs) and metabolites of polycyclic aromatic hydrocarbons</td>
<td>Dibenzo(a,h)anthracene, Fluoranthene, Anthracene, Naphthalene, Benzo[ghi]perylene, Benzo[a]pyrene, Benzo(k) fluoranthene, Benzo(b) fluoranthene, Pyrene, Fluorene, Benzo[a]anthracene, Ideno[1,2,3-cd]pyrene, Chrysene, Phenanthrene, Acenaphthylene, Acenaphthene, 1-hydroxypyrene, 1-hydroxyphenanthrene</td>
<td>Contamination ratio must be less than 1</td>
</tr>
<tr>
<td>Metals</td>
<td>Mercury (Hg), Cadmium (Cd), Lead (Pb)</td>
<td>Contamination ratio must be less than 1</td>
</tr>
<tr>
<td>Radionuclides</td>
<td>Cesium 137 ($^{137}$Cs)</td>
<td>Contamination ratio must be less than 1</td>
</tr>
<tr>
<td>Tributyltin compounds / imposex</td>
<td>Tributyltins (TBT), Imposex index</td>
<td>Contamination ratio must be less than 1</td>
</tr>
<tr>
<td>Pharmaceutical substances</td>
<td>Diclofenac</td>
<td>Currently not included in the marine water classification</td>
</tr>
</tbody>
</table>

The COMMON SENSE project has received funding from the European Union’s Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.
The COMMON SENSE project has received funding from the European Union’s Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.

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**Table according to “Zestaw właściwości typowych dla dobrego stanu środowiska wód morskich”, Report addressed to the European Commission”**\(^{130}\).

Initial Assessment was prepared based on 10 core indicators in different matrices (fishes, mussels, sediments) depending on available data, for eight sub-basins of the Baltic Sea included in the HELCOM HOLAS.

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It was assumed that threshold of good environment status (GES) for criterion 8.1 is the value between good and moderate ecological status, estimated according to the HELCOM CORESET recommendation.

**Initial Assessment for Descriptor 8**, for Polish zone of the Baltic Sea, based on the MSFD, was determined as GES (according to “Wstępna ocena stanu środowiska wód morskich polskiej strefy Morza Bałtyckiego”, Report addressed to the European Commission[^131]).

### Descriptor 10: Marine Litter

*“Properties and quantities of marine litter do not cause harm to the coastal and marine environment”*

**Table 14. Criteria and indicators for GES of marine waters relevant to D10**

<table>
<thead>
<tr>
<th>Criteria and indicators for GES of marine waters relevant to D10</th>
<th>Core indicators</th>
<th>Typical properties for GES of marine waters</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Criterion 10.1 Characteristics of litter in the marine and coastal environment</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Indicator 10.1.1 Trends in the amount of litter washed ashore and/or deposited on coastlines, including analysis of its composition, spatial distribution and, where possible, source | Litter/wastes deposited on coastline | Frequency index less than or equal to:  
- for large-size litters 1  
- for small-size litters 6 |
| Indicator 10.1.2 Trends in the amount of litter in the water column (including floating at the surface) and deposited on the sea-floor, including analysis of its composition, spatial distribution and, where possible, source | Not prepared | Currently not included in the marine water classification |
| Indicator 10.1.3 Trends in the amount, distribution and, where possible, composition of micro-particles (in particular micro-plastics) | Not prepared | Currently not included in the marine water classification |


The COMMON SENSE project has received funding from the European Union’s Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.
Among the proposed core indicators (litter/wastes deposited on coastlines, litter/wastes in the water column and deposited on the sea-floor, amount and composition of micro-particles, litter/wastes ingested by marine animals) for assessment only one of them was selected: litter/wastes deposited on coastlines. Other indicators were not tested due to the lack of data in this field. Currently in Poland there is no monitoring of marine waters for the presence of suspended solids in the water column or at the bottom.

Initial Assessment for core indicator: Litter/wastes deposited on coastline, for sub-basins of the Baltic Sea based on the HELCOM HOLAS (among the eight sub-basins selected, only five of them were assessed due to the limited data, and regarding only to coastline) is ‘2’ (“poor ecological status”). Thus, Initial Assessment for Descriptor 10, for Polish zone of the Baltic Sea, based on the MSFD, was determined as subGES (according to “Wstępna ocena stanu środowiska wód morskich polskiej strefy Morza Bałtyckiego”, Report addressed to the European Commission133).

Descriptor 11: Underwater noise

“Introduction of energy, including underwater noise, is at levels that do not adversely affect the marine environment”

In the Baltic Sea the shipping is main source of the anthropogenic component of the underwater noise. The Baltic sea is the one of the most busies area in the world. It has been estimated that there are from 1800 to 2000 ships at sea in the Baltic at any given time.

In Poland there is no contemporary or in the past long term monitoring of the underwater noise properties in the Polish Exclusive Economic Zone, except of continuously performed by Polish Navy in the Gulf of Gdansk. However, the results of this observations are not published openly.

Sporadically completed ambient sea noise observations in the Southern Baltic Sea, both historical (in 70s) as well as performed at the beginning of this century by the IO PAN team, have given rather a confused picture relating to the noise level in different Southern Baltic Sea basins, character of the noise spectra, their dependence on wind speed, seasons and the depth of observation point.

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The COMMON SENSE project has received funding from the European Union’s Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.
Consequently, the description of the status of the marine environment for this descriptor is very difficult, with the exception of rather obvious statement of existence of high level of the traffic noise in the vicinity of the ship lanes.

Since September 2012, the Institute of Oceanography (including the Marine Station) of the University of Gdansk has been implementing Polish part of the project: ‘Baltic Sea Information on Acoustic Soundscape’, which main objective is pilot implementation of study on underwater noise within the descriptor 11 at regional level in the Baltic Sea.

In addition, from the 2015, the Institute of Meteorology and Water Management - National Research Institute (IMGW-PIB) will commence the governmental programme of long term monitoring of the underwater noise in the Polish Exclusive Economic Zone.

6.6 Social and Economic Assessment in the Initial Assessment\(^{134}\)

Social and economic analysis was prepared according to article 8(c) of the MSFD and was based on the sectoral approach. Major economic sectors that (can) influence the state of the Baltic Sea were characterized. The largest Polish administration units\(^{135}\) – provinces – were selected as evaluation areas. There are three provinces – Pomeranian Province, West Pomeranian Province, and Warmian-Masurian Province – that border the Baltic Sea. Social and economic analysis was performed using the following four steps:

1. description of the three provinces from economic and social perspectives;
2. description of economic sectors active in the Polish marine waters;
3. description of the influences of the economic sectors on the state of the marine environment;
4. evaluation of the future changes in the Polish marine waters according to the ‘Business as Usual’ scenario.

6.6.1 Social and economic characteristic of Polish Marine Areas and marine regions

Polish marine areas (PMA), according to the international law of the sea, include three different legal regimes: (i) internal waters; (ii) territorial waters; and, (iii) Polish exclusive economic zone. Total area of PMA equals 33,307 km\(^2\), out of which 10,673 km\(^2\) (3.4% of PMA) are internal and territorial waters. Over the past years sectors actively operating in PMA have been limited to transport, military, fishery, tourism and recreation. However, the variety and intensity of the economic uses of the sea is

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\(^{134}\) Information in this section, if not stated otherwise, were derived from the Initial Assessment: Wstępna ocena stanu środowiska wód morskich polskiej strefy Morza Bałtyckiego, Raport do Komisji Europejskiej, April 2014, 463 pp., http://www.mos.gov.pl/g2/big/2014_04/9cb6a1fad8785948a0931cadf6f7ce9.pdf

\(^{135}\) Administration structure in Poland is based on three levels: (1) 16 voivodeships (or provinces), which are further divided into (2) ‘powiats’ (counties), and these in turn are divided into (3) ‘gminas’ (communes or municipalities).
increasing. This increased demand for space is already causing increased tensions among the current and potential users. These tensions often result in conflicts, which sometimes are vivid and clearly visible, like in the Gulf of Gdansk or in the Vistula Lagoon. In addition, national and international regulations prioritize nature conservation and the need for a precautionary approach when using the sea space. As a result 62.3% of Polish internal and territorial waters are protected under various protection regimes, such as NATURA 2000 sites, landscape parks and national parks. PMA are presented on figure 14.

Figure 14. Polish Marine Areas and bordering provinces

The Pomeranian Province

The Pomeranian Province equals 18,000 km² and its total population is 2.24x10⁶ inhabitants. 67% of the Province’s population lives in the cities. The Province is dependent on the Baltic Sea, and one of its major strategic goals is to increase its international role as transportation hub, to develop shipping, logistics and shipbuilding industries. There are 12 harbours in the region out of which two (Gdynia and Gdansk) are of national importance. Growth of the off shore energy sector is also foreseen as an opportunity for the shipbuilding industry, and in more general terms for the

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136 Ports of national importance are defined according to the law of harbours (Ustawa o portach i przystaniach morskich, Dz.U. 1997 nr 9 poz. 44)
Province’s social and economic development. The Pomeranian Province has many protected and environmentally-valuable areas. These natural landscapes enhance the development of tourism and leisure activities. Small coastal towns and villages are the major beneficiaries of agri-tourism, and their economy is – to large extent – dependant on the tourism sector.

The West Pomeranian Province

The West Pomeranian Province equals 23,000 km² and its total population is 1.69x10⁸ inhabitants. It is one of the least populated provinces in Poland. Nevertheless, almost 69% of the Province’s population lives in the cities. Maritime industry, especially ports in Szczecin and Swinoujscie, transportation of cargo and passengers are the key branches of the West Pomeranian Province’s economy. Therefore, the Province’s strategy underlines the relationships with the Baltic Sea, and the necessity to further strengthen these links.

The Warmian-Masurian Province

The Warmian-Masurian Province has the shortest sea border and it has only access to the Vistula Lagoon. Its area equals 24,173 km² and its total population is 399,000. 58% of its inhabitants live in the cities. It has one of the least-developed transportation systems, not only in Poland but also in the whole European Union. It is characterized by high biodiversity and high number of protected areas in the region; over 46% of the Province territory is protected under some form of nature protection regime. These environmental conditions support the development of agriculture and nature-based tourism, but they limit industrial development and investments in the region due to the protection measures. Therefore, the development of agriculture and agri-tourism are considered important in the Province’s strategy. This strategy also underlines that access to the Vistula Lagoon can greatly support regional development through increased collaboration with Kaliningrad Oblast in Russia.

6.6.2 Economic uses of Polish Marine Areas

Polish marine areas (PMA) are subjected to many anthropogenic pressures and all most important marine sectors are either already present or plan to develop the sea space. The same areas on the sea are often used by many sectors or actors, and the number of interested parties will increase in the near future. Figure 15 shows the current use of the Polish Exclusive Economic Zone.
The COMMON SENSE project has received funding from the European Union’s Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.
recreational visits is also increasing. The high season starts in June and ends in September, but the average visit to Polish cities lasts between a few and several hours.

Harbours

Gdynia, Gdansk, Szczecin and Swinoujscie are, according to the law on harbours\(^{138}\), ports of national importance. Gdynia and Gdansk are also important for the Baltic Sea region. The quantity of transhipment in both ports increased in 2010 -- when compared in 2009 -- by 10.5% in Gdynia and by 44% in Gdansk. Ports in Szczecin and Swinoujscie constitute the largest harbour complex in the Baltic Sea, and are important routes for transportation for the goods from the western and southern-western parts of Poland.

Shipbuilding industry

The shipbuilding industry was still in crisis in 2010, although the number and quality of contracts has improved. There are 5,300 companies in shipbuilding sector, and they employ 34,000 people. However, the majority of these companies are small. Only one out of three Polish large shipyards -- Stocznia Gdansk -- survived the current crisis and previously the change from planned to market economy. This company now mainly produces wind turbines and other steel constructions. Production for maritime sector (highly specialized ships) provides only about 40% of the company’s total income. Shipyards producing yachts, smaller and specialized vessels, and repair yards are in much better economic situation. However, the overall production in Poland is still decreasing. The share of the Polish shipbuilding industry in the world’s production is also decreasing. In 2004 it was around 2.2% of the world’s total production, but in 2009 in was less than 0.7%.

Fishery and fish processing industry

Fishery is the most traditional use of the sea, but it is also a sector in decrease. In 2004 the Polish fishing fleet in the Baltic Sea consisted of 1,243 ships, while in 2012 this number was reduced to 795 vessels. In 2012 fishery catches weighted 120,000 tons and this was an increase by almost 9% when compared with 2011. This increase in the weight of catches resulted from greater catches of herring (increase by 12%), of cod (by 25%), and of freshwater fish from the lagoons (by 50%). However, the quality of fish is declining, and, therefore, the fish processing industry prefers to import raw fishes. As a result the use of fishing quota, arising from Common Fishery Policy, is lower than assigned to Poland. In 2012 only 95% of quota was used. The fish consumption is Poland is also decreasing, i.e., by 4% in 2012 when compared with 2011. Nevertheless, in 2012 due to the import of raw fishes and despite the declining consumption, the fish processing industry observed an increase in its production (by 13%) and in its income (by 2.7%). Although these data are only available for the larger companies\(^{139}\), the situation for the fish processing industry is assessed as being good. The increase in demand in national markets is also expected in the near future. In 2012 fishery-related sectors...

\(^{138}\) Ustawa o portach i przystaniach morskich (Dz.U. 1997 nr 9 poz. 44)

\(^{139}\) Larger companies are defined in the report as these that employ 9 or more people.

The COMMON SENSE project has received funding from the European Union’s Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.
employed more than 26,000 people, and a small increase (by 0.4%) was noted when compared with 2011. The fishing and fish processing sectors are dominated by private companies and more than 99% of employees work in this type of enterprises.

Agriculture

Agriculture is not the part of maritime economy, but it was included in the Initial Assessment because of the high impact it has on the environment of the Baltic Sea. The analysis was based on the three previously identified marine provinces and the Greater Poland Province. The Greater Poland Province was included in this analysis due to its vicinity to the Baltic Sea and importance of the agriculture sector in this region.

Agriculture is a source of two major water pollutants: nitrates and phosphates. The most important sources of these pollutants are fertilizers. Between 2008 and 2010, their use in Poland – depending on the province – was either stable or slightly decreasing. Another source of pollution is breeding of livestock, and especially the forage. This biogenic production in the evaluated provinces was above the maximum allowed quotas, but the excess was small. The marine provinces are characterized by intense agriculture, and their influence on the state of the Baltic Sea is the greatest. However, this state is also influenced by the situation in other parts of Poland. Poland has about 50% of agriculture land in the whole Baltic Sea catchment area, and about 45% of people living in the catchments area are its citizens. To achieve goals settled by the HELCOM Convention, it is necessary to modernize the individual farms, and the quality and efficiency of fertilizer usage.

Mining Industry

Mining possibilities and the value of mineral resources in the Polish Exclusive Economic Zone is recognized in general terms only. Mineral deposits on the Baltic Shelf account for 13% of national oil resources, and for 3% of natural gas. Prospects for discovery of new deposits are estimated between 2-3 x10^7 tons (oil) and 1x10^11 m^3 (natural gas). The Petrobaltic company is now the only entity entitled to extract gas and oil in the PMA, and the production in 2006 equalled 3.1x10^6 tons for oil and 4.9x10^9 m^3 for gas.

Less information is available on gravel and sand deposits. Fragmentary data are available for a selected number of sites. Most of these sites have been already subjected to a licencing procedure, and are currently the commercial property of private companies. Sand and gravel extraction is permitted at least 5 km off the coastline, and in places deeper than 20 m. No detailed information on the volume of gravel and sand extraction is given in the Initial Assessment.

Amber, mineral and thermal water are other resources to be exploited from the Baltic Sea. There is very little data on the quality and spatial distribution of amber, and only future research could deepen this knowledge and promote the commercial extraction. Up to now first attempts to select amber sites to be used commercially were unsuccessful. Mineral and thermal water are used -- to limited extent -- in spa and wellness industry (six most important water intakes). However, the
excessive exploitation could influence negatively the composition and properties of these waters, and, therefore, their extraction should be limited and strictly supervised.

**Tourism and recreation**

Tourism and recreation is an important sector of Polish economy, and seaside travels are among the most popular long-term holiday destinations. Leisure and tourism industry is the key element in the development of coastal regions. Marine tourism is predominantly related to the development of small ports and marinas in towns and cities with historical and cultural heritage. Short cruises, recreational fishing, scuba or wreck diving are other examples of leisure activities emerging on the Polish coast. These marine activities enhance the development of on-land infrastructure, including hotels, restaurants, or bike-rentals.

**Military uses**

Parts of PMA are designated for military purposes. Some areas might be completely closed for any other uses. However, it is usually not the case, and only partial limitations apply, i.e., temporary closures during military exercises. Military areas have not been intensively exploited, and, therefore, marine ecosystems in these areas are often well preserved. These areas should be protected according to environmental legislation. Yet, new conflicts may arise when new military training grounds (subjected to permanent closures) are to be created. Water pollution with oil products, scaring off the marine animals, and increased level of underwater noise are the three most important pressures generated by areas of military importance.

**Other uses**

The uses described above represent the most important and the most active sectors that operate in PMA. However, further economic developments, the Blue Growth initiatives, and the increased demand for clean energy will intensify the competition for space. This competition will come from currently operating and new sectors and sub-sectors. Blue biotechnology, usage of algae and other marine organisms in pharmaceutical and cosmetic industry, aquaculture, production of biogas and biofuel, use of reeds in furniture and decorative industry are only a few examples of emerging and innovative uses that are in line with the ideas of Blue Growth. Another use, now not present in the PMA, are the off-shore wind farms. By 2020 Poland will have to produce 20% of its energy from renewable resources, and this amount – at least partially – will have to be extracted from marine areas. Although off-shore wind farms are most widely discussed sources of blue energy, other possibilities include wave energy, energy from marine currents or osmotic power.

**6.6.3 Pressures of economic sectors on marine areas**

The Initial Assessment analyse the pressures from various sectors and sub-sectors of national economy. This analysis is predominantly descriptive, addresses selected sectors only, and defines pressures on very general level. No or very limited quantification is given for the PMA, and for Polish economic sectors. Table 15 summarizes the results of the pressures analysis.
Table 15: Pressures of economic sectors on Polish Marine Areas

<table>
<thead>
<tr>
<th>Economic sector</th>
<th>Pressures on the marine environment</th>
<th>Effects on the marine environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transport</td>
<td>(1) oil wastes; (2) sewage and organic waste; (3) discharge of ballast water; (4) emissions;</td>
<td>(1) limits in oxygen supply, sedimentation of heavy water-insoluble compounds of oil wastes, toxic effects of wastes; (2) water pollution and interference with ecosystem functioning and ecosystem processes; (3) negative influence on the marine organisms, including limits in oxygen supply, sedimentation of heavy water-insoluble compounds of oil wastes, toxic effects of wastes; (4) ocean acidification and its negative influence on marine organisms;</td>
</tr>
<tr>
<td>Harbours</td>
<td>(1) water pollution; (2) contamination of bottom sediments; (3) emissions; (4) noise;</td>
<td>According to the Initial Assessment, these pressures are constantly monitored through the monitoring programmes implemented by the Polish harbours themselves. The monitoring results suggest that the influence of identified pressures on the state of marine environment is limited. Further restrictions put on ships and on fuel used in shipping will further limit the negative influence of combined transport and harbour sectors.</td>
</tr>
<tr>
<td>Shipbuilding industry</td>
<td>(1) toxic and hazardous wastes (e.g., combustion and welding products, paint, oil or lubricants ingredients); these pollutions are relevant for air, water, and soil; (2) noise; (3) emissions;</td>
<td>(1) negative effects on health and living conditions of marine organisms; deterioration of state of marine ecosystems; (2) disturbance of local wildlife, disruption of its reproductive cycles; (3) ocean acidification and its negative influence on marine organisms;</td>
</tr>
</tbody>
</table>

- negative effects on marine biodiversity, tourism, recreation and fishing industries
- negative effects are limited
- smaller populations of marine organisms, decrease of marine biodiversity, increased risks to human health, negative effects on tourism, recreation and fishing industries
The COMMON SENSE project has received funding from the European Union’s Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.
6.6.4 Evaluation of future changes in Polish Marine Areas – a ‘Business As Usual’ scenario

Various economic sectors differently influence the state of marine environment. Apart from interactions between the sectors and the marine environment, sectors themselves interact in a various ways. They can be in conflict, or create coalitions, or remain inert in their relations. The sectors’ need for marine space is also relatively different. Some sectors can co-exist in the same area, other need the space exclusively. Figure 16 shows the relationships between selected sectors present in PMA.

<table>
<thead>
<tr>
<th></th>
<th>New uses</th>
<th>Transport</th>
<th>Harbours</th>
<th>Tourism and recreation</th>
<th>Military uses</th>
<th>Fishery</th>
<th>Agriculture</th>
</tr>
</thead>
<tbody>
<tr>
<td>New uses</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Transport</td>
<td></td>
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<tr>
<td>Harbours</td>
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<td></td>
</tr>
<tr>
<td>Tourism and recreation</td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Military uses</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Fishery</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Agriculture</td>
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<td></td>
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</tr>
</tbody>
</table>

![Figure 16. Relationships between various sectors present in Polish Marine Areas (WWF)](image)

These interactions between various sectors should be considered when long-term plans and strategies are prepared. Such long-term plans and strategies can either support the cohesion and limit the spatial conflicts between different sea users, or have the opposite effect: they can create more competitions and problems than they solve. While preparing such documents, or preparing any cost-benefit analysis, not only cooperation and competition strategies should be evaluated. It is as important to assess future, potential and most likely tendencies in development of various sectors, and the policies that influence (or might influence) these sectors in the future. Table 16 summarizes future developments identified in the Initial Assessment. These future tendencies present more general trends valid for the whole Baltic Sea region, and are often lacking the detailed characteristics of national sectors.
Table 16. Tendencies in Polish marine sectors’ developments

<table>
<thead>
<tr>
<th>Economic sector</th>
<th>Tendencies in sector developments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transport</td>
<td>General tendencies valid for the whole Baltic Sea:</td>
</tr>
<tr>
<td></td>
<td>(1) increased amount of goods transported by sea;</td>
</tr>
<tr>
<td></td>
<td>(2) larger and fastest ships that are a greater threat to biological diversity;</td>
</tr>
<tr>
<td></td>
<td>(3) development of Baltic Sea harbours and container terminals;</td>
</tr>
<tr>
<td></td>
<td>(4) increase in passenger transportation services;</td>
</tr>
<tr>
<td></td>
<td>(5) cruise tourism development;</td>
</tr>
<tr>
<td></td>
<td>(6) implementation of MARPOL Annex IV on “Prevention of pollution by sewage from ships”; this implementation can result in: (i) possible increase of costs, and (ii) problems related to unclear stipulations of Annex IV;</td>
</tr>
<tr>
<td>Poland-specific prognosis:</td>
<td>(1) increase -- by 2030 -- in passenger transportation by 1.5-2% (maritime shipping) and by 1.7-2.4% (inland and coastal shipping);</td>
</tr>
<tr>
<td></td>
<td>(2) recovery and further development of ferry transportation in Polish ports;</td>
</tr>
<tr>
<td></td>
<td>= the level of (negative) influence on the state of marine environment will increase</td>
</tr>
<tr>
<td>Harbours</td>
<td>General tendencies valid for the whole Baltic Sea:</td>
</tr>
<tr>
<td></td>
<td>(1) increased transhipment in the Baltic Sea harbours;</td>
</tr>
<tr>
<td></td>
<td>(2) implementation of MARPOL Annex IV on “Prevention of pollution by sewage from ships” resulting in additional investments in harbours;</td>
</tr>
<tr>
<td>Poland-specific prognosis:</td>
<td>(1) increase -- by 2033 -- in goods transhipment in Polish ports by 57.7%;</td>
</tr>
<tr>
<td></td>
<td>= the level of (negative) influence on the state of marine environment will increase</td>
</tr>
<tr>
<td>Shipbuilding industry</td>
<td>The evaluation was performed in connection to off-shore wind farms.</td>
</tr>
<tr>
<td>General tendencies valid for the whole Baltic Sea:</td>
<td>(1) development of SUPERGRID initiative;</td>
</tr>
<tr>
<td>Poland-specific prognosis:</td>
<td>(1) PMA are good locations for the off-shore wind farms, but low capacity of coastal power grid is an important limiting factor;</td>
</tr>
<tr>
<td></td>
<td>(2) 1,000 km² of marine space available for off-shore wind farms with depth between 20-30 meters, and 1,500 km² of marine space available for off-shore wind farms with depth between 30-40 meters;</td>
</tr>
<tr>
<td></td>
<td>= the level of influence between the state of marine environment and potential investments in not discussed in detail but possible conflicts with nature conservation and landscape protection is mentioned</td>
</tr>
<tr>
<td>Fishery and fish processing industry</td>
<td>General tendencies valid for the whole Baltic Sea:</td>
</tr>
<tr>
<td></td>
<td>(1) changes in CFP, especially ban on discards and regionalization of management;</td>
</tr>
</tbody>
</table>
Poland-specific prognosis:

(1) reduction of fishing vessels and their (partial) modernization as direct effects of EU accession and implementation of CFP;
(2) investments in fishing harbours concerning road and harbour infrastructure (result of EU accession and EU funds);
(3) improved conditions for fish landing and fish preparation for sale (result of EU accession and EU funds);

=changes in influence on Baltic Sea environment not assessed

Agriculture

General tendencies valid for the whole Baltic Sea:

(1) agriculture is the most important sector contributing to excessive eutrophication in the Baltic Sea;
(2) implementation of HELCOM Baltic Sea Action Plan\textsuperscript{140} to reduce the discharge of phosphates and nitrates;

= the level of negative influence on the state of marine environment will increase in short-term but there are initiatives that \textasciitilde; most likely \textasciitilde; will reduce the pressures coming from agriculture in the long-run

Mining industry

Not assessed

Tourism and recreation

Poland-specific prognosis:

(1) increased number of visitors;
(2) relatively small development of yachting tourism in Poland;
(3) increased demand for active recreation;

=changes in influence on Baltic Sea environment not assessed

Military uses

Not assessed

Other uses

Not assessed (apart from the off-shore wind farms in relation to development of shipbuilding industry)

Given the above assumptions, and availability of social and economic data, the Initial Assessment for PMA evaluates the degradation costs of marine environment per sector. The Initial Assessment defines the ecological losses as reduced or not achieved social benefits gained through the use of natural environment and its resources. These ecological losses can be measured through the decrease in the current or in the future social welfare.

Harbours

Harbours were the first economic sector that was assessed using this methodology. Environmental losses, or mitigation costs of negative effects that ports have on the environment, were calculated


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using two approaches. First, the cost of treating wastewater and communal sewage generated by harbours and shipping activities were calculated. This calculation assumed that:

1. investment costs to build a new sewage treatment plant are about € 262 for treating 1 m$^3$ of wastes in a large sewage treatment plant, € 476 in a middle-size sewage treatment plant, and € 1,667 in a small-size sewage treatment plant;
2. operating costs for treating 1 m$^3$ of wastes equals about € 0.08 in a large sewage treatment plant, € 0.18 in a middle-size sewage treatment plant, and € 0.51 in a small-size sewage treatment plant;
3. 8$x10^3$ m$^3$ of domestic waste is collected annually from the ships entering Polish ports, and most of these wastes are treated in the large power plants.

As a result the total annual cost of treating harbour related wastes equals € 2.86$x10^6$.

This ‘sewage costs’ approach was complemented by the ‘external costs approach’. Here, the negative influence on marine environment was calculate for two out of three largest Polish ports, i.e., for Gdynia and Gdansk$^{141}$. These externalities$^{142}$, based on data from 2010, were calculated as € 23.5$x10^6$ for the Gdansk harbour and € 46.7$x10^6$ for the port in Gdynia. The Initial Assessment underlines that these costs cannot be completely eliminated but they can be reduced. The reduction of these externalities needs to go beyond the environmental aspects and consider economic importance of ports. As a result the possibilities to implement mitigation strategies might be limited. Promotion and development of intermodal transportation was listed as one of the best strategies to limit the external costs of harbours functioning.

Fishery

Fishery was the second economic sector addressed in the Initial Assessment. The size of fish stock was considered as the most important factor. However, fish stock size is not dependant on fishing activities only. Agriculture has a strong influence on the fish stock size. Therefore, the interactions between land and sea are extremely important, but these interactions are almost completely unrecognized in Poland. Therefore, the assessment concludes that the costs of environmental degradation related to fishing sector cannot be estimated without future research.

Agriculture

Agriculture has a great influence on the marine environment, although – as Initial Assessment assumes - pressures arising from this sector is Poland are relatively smaller than in the most of EU countries. Poland, when compared with other Member States, uses relatively less nitrogenous fertilizers and produces relatively less natural fertilizers$^{143}$. However, agriculture is a sector

$^{141}$ Calculation for Szczecin, the third largest Polish port of national importance, was omitted, although no reasons was given to explain this omission.

$^{142}$ The methodology for this calculation is described in the Initial Assessment. However, this description is vague and it is not possible to re-calculate the values based on this description.

$^{143}$ No exact numbers were given in the Initial Assessment and none are, therefore, cited.

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important for Polish economy, and a sector that is believed to develop and modernize in the future. Substantial funds will be needed to support the pro-environmental programs and activities\textsuperscript{144} in this sector.

Tourism

The (negative) influence of a tourism sector on the marine environment was assessed using the costs of treating sewage and wastewater. Only the volume of sewage and wastewater generated by tourists was used for this calculation. Annually about 2 million tourists visits Polish coast. It is estimated that a single tourist generate between 2 and 4.3 m$^3$ of wastes every day. Assuming that: (i) the average investment cost for 1 m$^3$ of sewage treatment equals € 476, and (ii) the average operating cost equals € 0.26, the total externalities generated by 2 million visitors a year are around € 6.6x10$^9$.

Nature conservation

Natural interactions between land and sea are the cause of coastal erosion. The Hel Peninsula and the Vistula Spit are the most affected parts of the Polish coast. The long term governmental programme - Coastal Defence Programme\textsuperscript{145} – was developed to protect the Polish coast against erosion. In 2012 € 16.2x10$^6$ was designated to finance coastal protection. Sea level rise will increase the risk of coastal erosion, and over 2,200 km$^2$ of coastal areas are threatened because of storm-related floods.

NATURA 2000 management plans have the ultimate goal to maintain and to restore, at a favourable conservation status, natural habitats and species of wild fauna and flora. The cost of these plans' preparation was estimated at around € 2.5x10$^6$. The implementation cost of these protection plans is further estimated at around € 6.6x10$^7$. The Initial Assessment further underlines that about 70% of these costs should be reimbursed through various EU initiatives and funding programmes.

6.6.5 Strategies influencing the present and future use of marine resources and implementation of MSFD

There are variety of documents, strategies, and legal acts that may support or hinder the implementation of MSFD. The Initial Assessment discusses these documents as important guidelines for further changes in the nature conservation sector. Table 17 summarizes the most important documents that were discussed in the Initial Assessment.

\textsuperscript{144} No external costs were calculated and only general remarks that are summarized in this report are available.

\textsuperscript{145} Coastal Defelce Programme is in fact a legal act (Ustawa z dnia 28 marca 2003 r. o ustanowieniu programu wieloletniego "Program ochrony brzegów morskich", Dz.U. 2003 nr 67 poz. 621).
Table 17. Strategies influencing the present and future use of marine resources and the state of marine environment of the Polish Marine Areas

<table>
<thead>
<tr>
<th>Spatial reference</th>
<th>Name of the regulation</th>
<th>Related objectives and remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>International</td>
<td>United Nations Convention on the Law of the Sea (UNCLOS)</td>
<td>It defines rights to exploit resources in the Exclusive Economic Zones but also obliges the signing parties to protect and preserve marine environment.</td>
</tr>
<tr>
<td>International</td>
<td>International Convention for the Prevention of Pollution From Ships (MARPOL)</td>
<td>It aims to minimize pollution coming from the ships, including dumping, oil, hazardous substances, and their accidental discharge.</td>
</tr>
</tbody>
</table>
| Baltic Sea        | Convention on the Protection of the Marine Environment of the Baltic Sea Area | Pollution prevention through the use of the 'Best Environmental Practice' (BEP) and the 'Best Available Techniques' (BAT); Related documents: Baltic Sea Action Plan (BSAP), National Implementation Plans (NIPs) for the BSAP, Baltic Sea Protected Areas (BSPAs), or HELCOM Copenhagen Declaration; Four major segments of HELCOM Baltic Sea Action Plan include:  
- eutrophication – towards a Baltic Sea unaffected by additional eutrophication from human activities;  
- hazardous substances – towards a Baltic Sea with life undisturbed by hazardous substances;  
- biodiversity and nature conservation – towards favourable conservation status of Baltic Sea biodiversity;  
- maritime activities – towards a Baltic Sea with maritime activities carried out in an environmentally friendly way; |
<p>| European          | Birds (2009/147/EC) and Habitats (92/43/EEC) Directives | The overall objectives of these directives are to maintain or to restore, at a favourable conservation status, natural habitats and species of wild fauna and flora, and to maintain the populations of wild birds, at the level, which corresponds to ecological, scientific and cultural requirements, and regional and local characteristics. |
| European          | European Commission Green Paper | Major goal: sustainable and integrated use of marine resources. |</p>
<table>
<thead>
<tr>
<th>European Integrated Maritime Policy</th>
<th>Key directions of this policy include:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• increasing the competitiveness of European maritime economy;</td>
</tr>
<tr>
<td></td>
<td>• sustainable use of marine resources;</td>
</tr>
<tr>
<td></td>
<td>• leadership in science and technology;</td>
</tr>
<tr>
<td></td>
<td>• increasing the attractiveness of employment in maritime sectors;</td>
</tr>
<tr>
<td></td>
<td>• clustering;</td>
</tr>
<tr>
<td></td>
<td>• defining legal conditions and requirements for the development of maritime economy;</td>
</tr>
<tr>
<td></td>
<td>• increasing quality of life in coastal areas;</td>
</tr>
<tr>
<td></td>
<td>• development of leisure and tourism industry in the coastal zones;</td>
</tr>
<tr>
<td></td>
<td>• management that embrace interactions between land and sea;</td>
</tr>
<tr>
<td></td>
<td>• marine spatial planning to support maritime economy development;</td>
</tr>
<tr>
<td></td>
<td>• proper management of marine areas.</td>
</tr>
<tr>
<td>DG TREN White paper 2011</td>
<td>It is a roadmap to a ‘Single European Transport Area’ and this document is not related to maritime transport only. However, it puts forward the idea of ‘Motorways of the Sea’ and clearly states that transport policy is much more than a simple development of infrastructure.</td>
</tr>
<tr>
<td>A European Strategy for Marine and Maritime Research</td>
<td>This document promotes marine and maritime research and aims to reconcile the protection of marine ecosystems with the development of sustainable maritime economy.</td>
</tr>
<tr>
<td>EU Strategy for the Baltic Sea Region</td>
<td>Key objectives of this strategy include:</td>
</tr>
<tr>
<td></td>
<td>• more active EU involvement in the region;</td>
</tr>
<tr>
<td></td>
<td>• division of responsibilities between the EU and the Baltic Sea Region;</td>
</tr>
<tr>
<td></td>
<td>• introduction of local actions into higher level policy.</td>
</tr>
<tr>
<td></td>
<td>The four pillars of this strategy present the Baltic Sea Region as:</td>
</tr>
<tr>
<td></td>
<td>• environmentally-friendly;</td>
</tr>
<tr>
<td></td>
<td>• prosperous;</td>
</tr>
<tr>
<td></td>
<td>• easily-accessible;</td>
</tr>
<tr>
<td></td>
<td>• and safe.</td>
</tr>
</tbody>
</table>

The COMMON SENSE project has received funding from the European Union’s Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.
The COMMON SENSE project has received funding from the European Union’s Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.

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This strategic objective was proposed by the expert version of the National Spatial Development Concept and was described in the Initial Assessment. However, the expert version has not been fully accepted, changes have been endorsed, and the strategic objectives have been rephrased. The marine areas and their development are an important part of the formally accepted document, and the need for integration is underlined. The formal version of the document can be found at: https://www.mir.gov.pl/english/Regional_Development/Spatial_Policy/NSDC_2030/Documents/KPZK_2030_ENG_small.pdf
6.6.6 Sectoral objectives and priorities, and their relevance for MSFD\(^{147}\)

MSFD does not exist in a policy vacuum. The protection of the (marine) environment is often considered as one of the pillars of human activities rather than an overarching goal. Therefore, some policies or strategies may be conflicting or potentially conflicting with the objectives and obligations put forward by MSFD. Table 18 evaluates Polish sectoral strategies and their main objectives with the aim to assess their potential interactions with MSFD. This evaluation also describes the policy background, in which environmental objectives of MSFD are to be achieved. Information in Table 18 is complementary to the evaluation performed within Initial Assessment.

Table 18. Sectoral policies in Poland and their interactions with MSFD objectives

<table>
<thead>
<tr>
<th>Name of the policy</th>
<th>Major relevant objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Strategy for Fisheries Development for years 2007-2013(^{148})</td>
<td>The policy is fully in line with the CFP and its objectives are predominantly economic. They aim to ensure social safety and well-being of (coastal) communities that depend on fishing and aquaculture. In order to achieve social and economic well-being, the National Strategy for Fisheries Development -- among others -- strive to (i) increase the fishing sector profitability, (ii) improve the quality of fish products, (iii) modernize the fishing fleet, and (iv) support the development of aquaculture. Despite its economic character, the strategy underlines the need for sustainable use of living resources and calls for support for coastal fisheries, which have relatively smaller impact on the marine environment.</td>
</tr>
<tr>
<td>Directions for Tourism Development until 2015(^{150})</td>
<td>This strategy does not focus on marine and coastal tourism itself. However, many of its elements can influence the state of marine environment. It basically calls for development of (i) tourism infrastructure in the coastal areas, and (ii) new recreational services on the coast of the Baltic Sea.</td>
</tr>
</tbody>
</table>

\(^{147}\) Selection of the strategies and description of their goals is based on: (i) BaltSeaPlan--Report 5 -- Strategies with relevance for Polish maritime space, and (ii) Deliverable 6.1 -- Typology of Conflicts in MESMA case studies-- from the MESMA project;


\(^{149}\) To our knowledge the new strategy has not released. No report concerning the effects of this policy implementation between the years 2007-2013 is available.

\(^{150}\) Kierunki Rozwoju Turystyki do 2015; http://www.msport.gov.pl/

The COMMON SENSE project has received funding from the European Union’s Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.
The overarching objective of this strategy is to increase the Polish harbours’ contribution to national economy, and their role in the international transportation network.

- the Initial Assessment foresee that these objectives will be fulfilled and the negative influence of harbours on the state of marine environment will increase; it is also worth noticing that all three largest ports are in a direct vicinity of marine NATURA 2000 sites.

This policy is in line with the Strategy for harbour development. It underlines the role of ports in national economy, and a need to increase transportation of cargo and passengers in the Polish ports. The development of intermodal transportation, railway and road infrastructure, are listed as important tools to achieve this policy’s goals.

- as in case of the Strategy for harbour development until 2015, this policy might result in increased negative influence on the state of the marine environment.

This policy includes guidelines for a long term development of the energy sector. It is partially relevant for the marine areas as it calls for strategic solutions, including identification and overcoming of the legal barriers, to enhance construction of the offshore wind farms.

- there are various studies assessing the influence of the offshore wind-farms on the state of the marine environment; however, it is impossible to assess this influence on Polish waters because the locations of the offshore wind farms are not known, and Environmental Impact Assessments for each site are still not publicly available (these processes are on-going); Initial Assessment mentions possible conflicts with nature conservation and landscape protection.

This is a guiding policy that calls for integrated and cross-sectoral approach to maritime sectors and activities. It seeks synergies between economic, environmental and social goals in order to increase social and economic welfare of coastal communities. It promotes development of harbours, fisheries and maritime transport. It also underlines the need for sustainable use of marine natural resources and improving the state of the marine environment, including the coastal zone.

- it is difficult to assess the influence of this policy on marine ecosystems as the results will mainly depend on the way the policy is implemented; maritime spatial planning can be used to balance various goals put forward by this policy; the planning processes have already started but they require long time and lot of funding.

6.7 Public consultations

The way that public is consulted concerning environmental issues is regulated by the legal act on public access to information about the environment and its protection, public participation...
in environmental protection and environmental impact assessment\textsuperscript{155}. This legal act defines the basic requirements for public consultations, and the procedure includes obligations to:

1. inform the public on the proceeding to be conducted;
2. make the documentation available for the public;
3. inform the public on where and how the comments and requests should be submitted; the minimum period for public consultations is 21 days;
4. consider the submitted remarks and comments;
5. inform the public what final decision has been undertaken.

This procedure was also relevant for the consultations on the Initial Assessment and on the Descriptors of GES (public consultations for these two documents were held in March 2013), and for the Monitoring Programme (public consultations were held in June 2014).

One of the disadvantages of this procedure is that it does not state the obligation to actively seek public participation and a need for public support. Consequently, this procedure does not -- in practice -- increase the legitimacy of a particular document or action\textsuperscript{156}. Therefore, to increase the legitimacy of environment-related actions, there is a new tendency, among the responsible agencies, to use more participatory approaches, and to involve stakeholders and other social actors already in the initial phase of the action’s preparation. This approach attempts to involve the public in the co-creation of actions and documents, and include them in the process before the formal document even exists. This participatory approach does not limit the formal obligations to consult the stakeholders after the document is created and according to the formal procedure stated by the legal act on public access to information about the environment and its protection, public participation in environmental protection and environmental impact assessment. Such a participatory approach has been tested through a few initiatives in the marine areas, e.g., the Pilot Draft Plan for the West Part of the Gulf of Gdansk, protection plans for seals and harbour porpoises, or for management plans for NATURA 2000 plans in the Gulf of Gdansk. This approach, however, has not been used while implementing the MSFD. Only formal consultation procedure was implemented. This is perhaps one of the reasons why the participation was extremely limited. Chief Inspectorate of Environmental Protection was responsible for preparation of all three already existing documents\textsuperscript{157}, and for organization and running the public consultations.

\textsuperscript{155} Ustawa o udostępnianiu informacji o środowisku i jego ochronie, udziale społeczeństwa w ochronie środowiska oraz o ocenach oddziaływania na środowisko (Dz.U. 2008 nr 199 poz. 1227)


\textsuperscript{157} These are -- as indicated above -- the Initial Assessment, Descriptors of GES, and Monitoring Programme.
Public consultations concerning Initial Assessment brought the attention of only two organizations. Only Naturalists’ Club and WWF Poland submitted remarks, and both these organizations are pro-environmental NGOs. Five organizations participated in the consultations on the MSFD Monitoring Programme. Four of them were environmental NGOs (Naturalists’ Club, WWF Poland, Foundation for Environmental Monitoring and OCEANA), and the fifth organization represented science (University of Hel Marine Station). There were two kinds of remarks submitted: of general and of detailed character. Chief Inspectorate of Environmental Protection replied to these remarks officially, and both the remarks and the official reply are available on the Chief Inspectorate’s website\textsuperscript{158}.

The following paragraphs summarize the selected and most important results of the public consultations concerning the four descriptors relevant for the Common Sense project, i.e., Eutrophication (descriptor 5), Contamination (descriptor 8), Marine Litter (descriptor 10), and Underwater Noise (descriptor 11). In addition, general remarks relevant for all consulted documents are summarized. Each remark has been assessed using the five point scale based on the Chief Inspectorate reply, i.e., remark accepted (A), partially accepted (PA), pending (P), rejected (R), and no full reply provided (NR).

General comments submitted during the consultation phase:

1. Set of GES determinants does not include all relevant indicators. Too many indicators are omitted, and these omissions are not properly justified. Therefore the assessment as a whole does not reflect the state of the marine environment (PA\textsuperscript{159}).
2. Set of GES determinants is – too great in extent – not coherent with the HELCOM CORESET project, and therefore its credibility can be challenged and questioned (NR).
3. Links between MSFD and the Birds and Habitats Directives are not properly addressed (PA\textsuperscript{160}).
4. Good environmental status of the whole marine waters should only be a considered achieved if the environmental status for all descriptors is assessed as reaching GES (one-out-all-out approach). Suggested threshold of 60% of descriptors assessed as reaching GES to assess to overall state as GES is not proper as all descriptors are interdependent and interlinked (P\textsuperscript{161}).

\textsuperscript{158} http://www.gios.gov.pl/bip/artykuly/1290/Ramowa-dyrektwy-w-sprawie-strategii-morskiej-2008-56-WE
\textsuperscript{159} Chief Inspectorate of Environmental Protection accepted this remark and acknowledged that only limited number of indicators were used to prepare the Initial Assessment. Only limited assessment was possible due to limited data availability. Otherwise, all descriptors would have to be assessed as sub-GES, what – according to Chief Inspectorate – would be a worse solution, and would not reflect the state of the marine environment at all.
\textsuperscript{160} Chief Inspectorate agreed with the remark, and acknowledged that the Initial Assessment linked attempted to ionk MSFD with Birds and Habitats directives. However, limited data availability prevented full integration between these three directives. In addition, the management plans for marine NATURA 2000 areas were being prepared in parallel with the Initial Assessment and with the Monitoring Programme.
\textsuperscript{161} The use of one-out-all-out approach is currently being discussed at the EC level, and there is no consensus that this approach should be used within the scope of MSFD implementation and MSFD assessments.
5. Environmental in PMA should not focus on the implementation on the MSFD only, but should provide information needed for off-shore investments. It should be possible to prepare Environmental Impact Assessments (solely) based on the results of state monitoring (R\textsuperscript{162}).

**Descriptor 5: Eutrophication**

1. Abundance of opportunistic macroalge is not described in a detailed enough way (NR).

**Descriptor 8: Contamination**

1. Lack of indicator for oil pollutions. Oil pollutions have a great negative impact on birds and are currently neglected in the MSFD documents (PA).
2. The occurrence of contamination should not be the only indicator to be assessed. Their influence on living organisms is more important what should be reflected in the MSFD documents (A).

**Descriptor 10: Marine Litter**

1. Only one indicator from HELCOM CORESET project is included as GES determinant for marine litter, i.e., litter/wastes deposited on coastline (PA).
2. The state of the environment of the Polish marine waters, concerning this descriptor, should not be assessed due to the lack of data. Further work and better methodologies should be developed (PA).
3. Monitoring of micro-plastic in the sand should be added (R).
4. Derelicts fishing gear monitoring should be added as separate sub-programme (R\textsuperscript{163}).

**Descriptor 11: Underwater Noise**

1. Practical lack of GES determinants for underwater noise (PA\textsuperscript{164}).
2. Add offshore wind farms as underwater impulsive sound sources(R\textsuperscript{165}).

In summary, the public consultations on the implementation of MSFD in Poland were relatively limited. Very few stakeholders were involved, although the number of remarks was considerably high. Chief Inspectorate of Environmental Protection attempted to reply to all submitted remarks. Comments and suggestions were well justified, but it was impossible to include all these suggestions into relevant documents because of lack of data or other practical obstacles.

\textsuperscript{162} The state monitoring is compatible with international, European and national regulations and allow for proper management of the marine environment. Offshore investments are part of marine management, and therefore, the monitoring programme is also relevant for assessing these kind of maritime activities.

\textsuperscript{163} This monitoring is included in monitoring concerning litter in water column. Separate monitoring is not needed.

\textsuperscript{164} Chief Inspectorate agreed that the assessment is incomplete, but detailed assessment could not have been performed due to lack of data.

\textsuperscript{165} Remark is too general to be included into the monitoring programme. However, Chief Inspectorate agreed that the offshore wind farms are important source of noise, and therefore should be monitored.
6.8 External assessment of the implementation process: barriers and challenges

Poland was not a part of the EU Technical Assessment because the Initial Assessment was not submitted in time. However, the MSFD implementation process can be assessed using the bottom-up approach. The results of the public consultations (see chapter 6.7) provide valuable information on the evaluation of the Common Sense descriptors from stakeholders’ perspective. In this chapter, we summarize the results of five semi-structured interviews performed with the representatives of various institutions directly or indirectly involved in the MSFD implementation.

**Strong points of the MSFD and its implementation process:**

**General points concerning the MSFD:**

1. MFSD supports nature conservation, and clearly prioritizes conservation over other uses;
2. MSFD enhances international cooperation and joint monitoring efforts; these joint monitoring programmes are especially important because seas and oceans have no borders;
3. MSFD enhances development of common methodological standards and data exchange protocols; it can also support the enforcement of these common standards; there are many guidelines and recommendations but they are often not implemented properly because it is not compulsory to use them; MSFD gives a chance to change it;
4. MSFD supports the implementation of the Regional Seas Conventions (e.g., HELCOM); it will be much easier to implement HELCOM guidelines, even though many HELCOM recommendations are already being used in Poland;
5. MSFD promotes ecosystem approach in the governance of European marine waters; however, in many Member States this approach is not common and sectoral approach still prevails; therefore, even with the help of the directive, it will be difficult to change the way the seas are managed;

**Poland-specific advantages:**

1. MSFD allows to integrate various environmental policies under one environmental goal (to achieve GES); such an ambitious goal has not been introduced into the Polish legislation before this directive;
2. MSFD is a good platform to combine various marine-related initiatives that are currently considered separately; this is going to be a huge challenge but also a great opportunity for integration;
3. MSFD adopts a holistic approach to marine management; therefore, the directive is relevant not only for the protection of marine ecosystems, but also for all economic sectors present in PMA; this is the first time when environmental legislation directly involves or affects these sectors;
4. the Initial Assessment was well-prepared and properly reflects the state of the marine environment in PMA;
5. the quality of marine monitoring in Poland has been increasing over the last years, and the implementation of MSFD will further enhance this process;
6. availability of European funds to support the implementation of MSFD, and consequently, the protection of the Baltic Sea;

**Weak points of the MSFD and its implementation process in Poland:**

General points concerning the MSFD:

1. the directive is rather general and focuses on developing programmes and strategies; more direct actions and requirements should be included in its text;
2. no consensus concerning GES among the MS; at the implementation stage, MSFD will face similar problems as WFD;
3. the exceptions to define GES are defined too broadly; this can be a significant issue in Poland, where the protection of the (marine) environment is not given high priority;
4. achieving GES, especially within a given timeline, is questionable;
5. the MSFD implementation is in its initial phase; therefore, especially in Poland, it is difficult to assess its final outcomes;
6. high economic cost to implement GES; this is a very important problem in middle/low-income MS such as Poland, especially during the EU-wide economic crisis;

Poland-related problems:

1. long transposition process; before MSFD has officially became a part of Polish legislation no funds could be budgeted for the implementation phase; this delayed the whole process because required actions had to be completed in a shorter timeline;
2. limited political will to focus on marine areas; marine areas are often not considered as an important part of the Polish territory;
3. there is very little knowledge on the MSFD in Poland; even organizations that are committed to protect marine environment are not always well-informed on its requirements and implementation steps;
4. limited public participation during the public consultations concerning MSFD-related documents;
5. too short time to consult the public, given the length of all the documents; the public consultations were not properly communicated, and the participatory approach was not used;

6. the administration structure design to implement MSFD in Poland is not well-organized; lack of formal role of maritime administration that is directly responsible for the overall management of the marine areas, including the management of NATURA 2000 areas;

7. the Ministry responsible for agriculture and fishery has too much influence on the MSFD implementation process; this Ministry is responsible for marine economy and not for the protection of the environment;

8. loopholes in the (marine) environmental legislation, and overlapping competences of various institutions; this legal and administration landscapes may hinder achieving GES;

9. no or limited integration with other directives (e.g., with Birds, and Habitats directives) and marine spatial planning initiatives;

10. bureaucracy; this is a general problem in Poland, but this problem is even more pressing for such a complex initiative as MSFD; too much time is wasted to meet formal requirements, and too little to decide how to protect the sea;

11. environmental law is very formalized; it focuses on procedures rather than on the results; this hinders efforts to manage and protect marine ecosystems;

12. limited resources (both financial and human) budgeted for the MSFD implementation; many activities had to be subcontracted; subcontracting limits the accountability of the process and the flexibility that is essential for such an initiative;

13. external factors; the implementation of the MSFD was influenced negatively by the financial crisis, i.e., economy and unemployment became national priorities, not the protection of the environment;

14. limited funds to implement marine monitoring; additional funding schemes will have to be developed;

15. although the quality of marine monitoring improves, it does not allow to properly manage marine ecosystems; it is uncertain if MSFD can significantly improve this situation short-time; the long-time impact is impossible to be assessed;

16. limited scientific and monitoring data is available, and, therefore, only limited number of descriptors and indicators can be assessed properly;

17. not all monitoring methodologies and devices/sensors are available; however, MSFD provides an opportunity to enhance this development;

18. insufficient coordination between environmental NGOs and public administration;

19. insufficient education; the goals of MSFD will not be achieved if the general public does not change their every-day habits; therefore, it is important to inform and
disseminate the knowledge how on-land activities influence the state of marine ecosystem;

6.9 Monitoring

6.9.1 Programme of marine water monitoring: an introduction

Programme of marine water monitoring\textsuperscript{168}, including demands of the MSFD, has been elaborated based on solutions adopted in the project of the initial assessment of the marine environment, relevant documents of EU WG DIKE (working group on data, information and knowledge exchange organized by European Commission in framework of MSFD Common Implementation Strategy and Joint Research Centre (JRC)) and the current cooperation within Baltic Sea area in framework of HELCOM in the project HELCOM MORE. The legislative basis for elaboration of the monitoring programme of the marine waters is Article 155c (1) of Polish Water Law (\textit{Polskie Prawo Wodne})\textsuperscript{169}. Based on that, Chief Inspector of Environmental Protection prepares the programme of monitoring including: monitoring sites, frequency and scope of monitoring, reference methods and quality conditions of measurements and studies for particular indicators referred in Article 61k (1) of Polish Water Law\textsuperscript{170}.

The indicators and parameters of 11 descriptors (D1-D11) have been proposed. Figure 17 presents the scope of monitoring programmes and subprogrammes, that were adjusted to requirements established by WG DIKE and HELCOM MORE. The relations between particular descriptors and current monitoring programmes were shown in Figure 17.

\textsuperscript{168} Program monitoringu wód morskich, Raport do Komisji Europejskiej, August 2014, 103 pp., http://www.mos.gov.pl/g2/big/2014_08/6019826b732890466868b5fe58333554.pdf

\textsuperscript{169} Ustawa z dnia 18 lipca 2001 r., Prawo wodne, Dz.U. 2001 nr 115 poz. 1229.

\textsuperscript{170} Ibidem.
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6.9.2 Monitoring areas

Areas covered by the Polish monitoring programme are shown on the map (Figure 19, including water monitoring stations) and listed in the Table 19.

Figure 19. Sub-basins of the Baltic Sea (HELCOM CORESET BD 2/2011) and locations of the Baltic water monitoring stations (HELCOM COMBINE)
Table 19. Sub-basins of the Baltic Sea according to HELCOM CORESET BD 2/2011 including proposed sub-basins in Polish water zone: 35A – “Vistula Lagoon Polish part” and 38A – “Szczecin Lagoon Polish part”

<table>
<thead>
<tr>
<th>Sub-basin number</th>
<th>Sub-basin name</th>
</tr>
</thead>
<tbody>
<tr>
<td>27</td>
<td>Eastern Baltic Proper Offshore waters</td>
</tr>
<tr>
<td>33</td>
<td>Gulf of Gdansk Offshore waters</td>
</tr>
<tr>
<td>35</td>
<td>Gulf of Gdansk Polish Coastal waters</td>
</tr>
<tr>
<td>36</td>
<td>Bornholm Basin Offshore waters</td>
</tr>
<tr>
<td>38</td>
<td>Bornholm Basin Polish Coastal waters</td>
</tr>
<tr>
<td>62</td>
<td>Eastern Baltic Proper Polish Coastal waters</td>
</tr>
<tr>
<td>35A</td>
<td>Vistula Lagoon Polish part</td>
</tr>
<tr>
<td>38A</td>
<td>Szczecin Lagoon Polish part</td>
</tr>
</tbody>
</table>

6.9.3 Monitoring programme concerning descriptors in Common Sense

Eutrophication (D5)


Current monitoring programme for Baltic Sea, performed in accordance with guidelines of HELCOM COMBINE and WFD for transitional and coastal waters, includes monitoring of:

1. temperature, salinity, oxygen, pH, transparency, nutrients, chlorophyll-a in the water;
2. phytoplankton and zooplankton in the water;
3. macrophytobenthos, macrozoobenthos on the seafloor.


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Due to the implementation of MSFD, the scope and frequency of selected monitoring parameters were changed under Regulation of Minister of Environmental Protection (Dz.U. 2013, Poz. 1558). The obligation of monitoring of nutrient winter concentrations will be introduced. Monitoring of nutrient concentrations and their ratios, chlorophyll-a concentrations, transparency and oxygen concentrations will be extended to Słupsk Furrow. Additional stations will be monitored in Gdansk and Bornholm Basin. Macrozoobenthos will be studied at two additional sites and macrophytobenthos will be determined at four additional sites.

Current studies on phytoplankton in the framework of HELCOM COMBINE include determination of species composition, their abundance and biomass, what enables to monitor species shift in composition and bloom events of toxic algae and cyanobacteria. Opportunistic macroalgae and perennial seaweeds and seagrasses are currently monitored at four stations and additional monitoring sites have been proposed.

Data on nutrient loads from rivers and atmosphere will be provided by HELCOM PLC (Pollution Load Compilation) and HELCOM - EMEP (European Monitoring and Evaluation Programme) in the framework of PMŚ.

Additionally, other methods are used in monitoring of selected parameters:

1. Ferry-Box system - nutrients and chlorophyll-a in summer season
2. remote sensing methods – chlorophyll-a (Satellite Remote Sensing Center IMGW-PIB, SatBałtyk project)

The detailed monitoring programme for descriptor 5 (Eutrophication) has been included in Attachment no. 4 of report “Monitoring programme of marine waters” (2014, in Polish, addressed to European Commission, but not yet submitted to EC) prepared by GIOŚ.

It should be emphasised that the current monitoring of eutrophication in Polish deep-sea zone of the Baltic Sea, carried out by Polish State Environmental Monitoring, and due to the implementation of MSFD monitoring will be extended to additional research stations.

**Contaminants and pollution effects (D8)**

The proposed monitoring programme for contaminants and pollution effects is consistent with MSFD requirements. The proposed indicators for D8 were selected basing on initial assessment of marine waters, results obtained by HELCOM CORESET HS (expert group on hazardous substances) and HELCOM COMBINE guidelines. According to monitoring programme both organic (PBDE, HBCDD, PFOS, dioxins, furans, dioxin-like PCBs, PCBs, PAHs and their and...
metabolites, TBT, pharmaceutical substances) and inorganic (mercury, lead, cadmium, cesium-137) chemicals should be determined in relevant matrices (i.e. biota, sediment, water). Biological effects of pollution are proposed to be evaluated on a basis of four core indicators: general stress indicator, genotoxicity indicator, reproductive disorders, general stress indicator for fish.

Concerning contaminant concentration three groups of core indicators (a - dioxins, furans and dioxin-like PCBs, b - pharmaceutical substances, c – PFOS) are not currently monitored in biota within PMŚ, and one group of core indicators (PAHs) is not monitored in sediments within PMŚ (probably will be included this year).

Concerning contamination effects, only one indicator (genotoxicity indicator – based on micronucleous induction) will be probably assessed from 2014, and the other mentioned above indicators, except fish disease indicator are planned to be included in monitoring programme after 2018. Fish disease indicator will not be assessed in the period 2014-2016 since this index is still considered as ‘pre-core indicator’ in HELCOM CORESET project and fish disease monitoring is very laborious.

The proposed monitoring programme will focus on studies of animals (fish and other organisms), macrophytobenthos, sediments and water.

The detailed monitoring programme for descriptor 8 (Contaminants and pollution effects) has been included in Attachment no. 6 of report ‘Monitoring programme of marine waters’ (2014, in Polish, addressed to European Commission, but not yet submitted to EC) prepared by GIOŚ.

It should be emphasised that the current monitoring of contaminants and pollution effects in Polish zone of the Baltic Sea, carried out by Polish State Environmental Monitoring, due to the implementation of MSFD will be extended with additional research stations, contaminants and matrices.

**Marine litter (D10)**

Marine litter is currently not included in the framework of State Environmental Monitoring. The proposed monitoring programme for marine litter is consistent with MSFD requirements and was prepared basing on:

1. results obtained by MSFD GES Technical Subgroup on Marine Litter (TSG-ML),
3. results obtained by MEDPOL,
4. meeting documents of HELCOM MORE,

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6. “Parametryzacja stanu zoologicznego wybrzeża południowego Bałtyku w świetle idei rozwoju zrównoważonego”, Jóźwiak 2010\textsuperscript{179}.

The following core indicators have been included in the monitoring programme of marine litter: litter deposited on coastlines, litter in the water column (including floating at the surface) and deposited on the seafloor, micro-particles in water and sediments, litter ingested by marine animals.

Monitoring of the amount of litter washed ashore and/or deposited on coastlines should be carried out with frequency of four surveys per year and include analysis of its composition, spatial distribution, source and temporal trends in its amounts in subsequent years for both small and large litter items. The alternative monitoring could be conducted by groups of volunteers, e.g. in the framework of Coastwatch Europe or Barefoot Beach Rescue Project. Monitoring of litter floating at the surface in the water column should be performed once per year at selected stations and along line transects.

Litter deposited on the seafloor has to be surveyed once per two years using e.g. fishing and bongo nets, and may be accompanied to monitoring of commercial fish. Besides, WWF Poland (World Wide Fund for Nature) will probably continue to remove abandoned fishing gear from the seabed and provide description of this litter (weight, type, location).

According to monitoring programme micro-particles in water and sediments should be monitored once per year. Micro-particles in water will be collected using plankton nets at selected stations and transects. Bottom sediments designated for determination of micro-particles should be collected at sites, where monitoring of contaminants will be conducted as well.

It has been proposed to carry out pilot studies on litter ingested by birds, mammals and fish based on e.g., analysis of stomach content.

The detailed monitoring programme for descriptor 10 (Marine litter) has been included in Attachment no. 7 of report ‘Monitoring programme of marine waters’ (2014, in Polish, addressed to European Commission, but not yet submitted to EC) prepared by GIOŚ\textsuperscript{180}.

The monitoring of marine litter in Polish zone of the Baltic Sea, due to the requirements of MSFD, will be implemented in years 2015-2016.


\textsuperscript{180} Program monitoringu wód morskich, Raport do Komisji Europejskiej, August 2014, 103 pp., http://www.mos.gov.pl/g2/big/2014_08/6019826b7328904668668b885e5833554.pdf
Underwater noise (D11)

Plans of the monitoring of the underwater noise in the Polish Exclusive Economic Zone is incorporated in a document - PROGRAMME FOR MONITORING OF MARINE WATER (PROGRAM MONITORINGU WÓD MORSKICH), Warsaw, July, 2014.¹⁸¹

In the frame of the pulse sounds monitoring - Descriptor 11.1. Distribution in time and place of loud, low and mid frequency impulsive sounds.

The main activity will be aimed at determination of the proportion of days and their distribution within a calendar year over areas of a determined surface. In addition, their spatial distribution, in which anthropogenic sound sources exceed levels that are likely to entail significant impact on marine animals measured as Sound Exposure Level (in dB re 1 μPa2 s) or as peak sound pressure level (in dB re 1 μPa peak) at one metre, measured over the frequency band 10 Hz to 10 kHz (11.1.1) will be determined.

Polish partner plans to perform measurements of impulse sounds in 19 quasi-square subareas of the PEEZ with size of one degree of Longitude per half degree of Latitude. During the monitoring proportion of days and their distribution within a calendar year over areas of the defined surface which could have impact on the marine fauna will be determined.

This will allow you to determine the current level of pulses and define trends in these class of sounds. Registration will include information concerning noise sources such as seismic, explosions, piling and sonar sounding signals, operating in this frequency band.

Data derived from explosions and military activities will be also included in the assessment of the noise impact, what is expected to be on a voluntary basis to provide this kind of information.

The second descriptor 11.2. includes - Continuous low frequency sound caused by continuous sources of sounds in the low frequency band, in particular resulting from shipping activities.

This parameter will be monitored using measurements at the underwater stations, combined with the results of the noise mapping models, and will provide the average noise level for one year, within the frequency band established in Commission Decision 2010/477/ EU. This parameter will allow the appointment of trends in the ambient noise level.

The overall scope of the monitoring program concerning the parameters of the Descriptors 11, had been planned on the basis of the second report of the Technical Sub-Committee, Underwater Noise, from November 2013 (TSG Noise).

6.9.4 Monitoring methodologies

Methods (concerning descriptors in Common Sense) currently used in Polish monitoring of the marine waters are listed in Table 20.

*Table 20. Reference methodology for selected parameters concerning the descriptors in Common Sense (according to “Program monitoring wód morskich”, Report addressed to the European Commission 182)*

<table>
<thead>
<tr>
<th>parameters</th>
<th>Reference methodology</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>method</td>
</tr>
<tr>
<td></td>
<td>methodology</td>
</tr>
<tr>
<td><strong>Biological parameters</strong></td>
<td></td>
</tr>
<tr>
<td>Phytoplankton</td>
<td>Utermöhl counting technique, quantitative and qualitative</td>
</tr>
<tr>
<td></td>
<td>Manual for phytoplankton analysis (GIOŚ 2010) and Manual for Marine Monitoring in the COMBINE Programme of HELCOM, Annexes to Part C, Annex C-6183</td>
</tr>
<tr>
<td>Chlorophyll-a</td>
<td>spectrophotometric</td>
</tr>
<tr>
<td></td>
<td>Manual for Marine Monitoring in the COMBINE Programme of HELCOM, Annexes to Part C, Annex C-4184</td>
</tr>
<tr>
<td>Zooplankton</td>
<td>microscopic, quantitative and qualitative</td>
</tr>
<tr>
<td></td>
<td>Manual for Marine Monitoring in the COMBINE Programme of HELCOM, Annexes to Part C, Annex C-7185</td>
</tr>
<tr>
<td>Phytobenthic plants</td>
<td>quantitative and qualitative</td>
</tr>
<tr>
<td></td>
<td>Manual for phytobenthic plants analysis, GIOŚ186</td>
</tr>
<tr>
<td></td>
<td>Manual for Marine Monitoring in the COMBINE Programme of HELCOM, Annexes to Part C, Annex C-9187</td>
</tr>
<tr>
<td>Macrozoobenthos</td>
<td>microscopic, quantitative and qualitative</td>
</tr>
<tr>
<td></td>
<td>Manual for macrozoobenthos analysis, GIOŚ188</td>
</tr>
</tbody>
</table>

182 Program monitoring wód morskich, Raport do Komisji Europejskiej, August 2014, 103 pp.,
183 Manual for Marine Monitoring in the COMBINE Programme of HELCOM
Manual%20for%20Marine%20Monitoring%20in%20the%20COMBINE%20Programme%20of%20HELCOM.pdf
184 Ibidem
185 Ibidem
186 Przewodniki metodyczne do badań terenowych i analiz laboratoryjnych elementów biologicznych wód przejściowych i przybrzeżnych, Biblioteka Monitoringu Środowiska, Warszawa 2010, 84 pp.
187 Manual for Marine Monitoring in the COMBINE Programme of HELCOM
Manual%20for%20Marine%20Monitoring%20in%20the%20COMBINE%20Programme%20of%20HELCOM.pdf
188 Przewodniki metodyczne do badań terenowych i analiz laboratoryjnych elementów biologicznych wód przejściowych i przybrzeżnych, Biblioteka Monitoringu Środowiska, Warszawa 2010, 84 pp.
### Physico-chemical parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Method/Equipment</th>
<th>Source(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water temperature</td>
<td>thermometers and sensors (<em>in situ</em> measurements during sampling)</td>
<td>Manual for Marine Monitoring in the COMBINE Programme of HELCOM, Annexes to Part C, Annex C-2&lt;sup&gt;189&lt;/sup&gt;</td>
</tr>
<tr>
<td>Transparency</td>
<td>Secchi disc, visual</td>
<td>Manual for Marine Monitoring in the COMBINE Programme of HELCOM, Annexes to Part C, Annex C-2&lt;sup&gt;190&lt;/sup&gt;</td>
</tr>
<tr>
<td>Salinity</td>
<td>gravimetric, electrometric, conductometric, (<em>in situ</em> measurements during sampling)</td>
<td>Manual for Marine Monitoring in the COMBINE Programme of HELCOM, Annexes to Part C, Annex C-2&lt;sup&gt;193&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

<sup>189</sup> Manual for Marine Monitoring in the COMBINE Programme of HELCOM

<sup>190</sup> Ibidem

<sup>191</sup> Ibidem


<sup>193</sup> Ibidem

<sup>194</sup> Manual for Marine Monitoring in the COMBINE Programme of HELCOM

<sup>195</sup> Ibidem


<sup>197</sup> Ibidem

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<table>
<thead>
<tr>
<th>Substance</th>
<th>Analytical Method</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Si-SiO$_2$</td>
<td>spectrophotometric</td>
<td>Manual for Marine Monitoring in the COMBINE Programme of HELCOM, Annexes to Part C, Annex C-2</td>
</tr>
</tbody>
</table>

198 Manual for Marine Monitoring in the COMBINE Programme of HELCOM
200 Manual for Marine Monitoring in the COMBINE Programme of HELCOM
202 Manual for Marine Monitoring in the COMBINE Programme of HELCOM
204 Manual for Marine Monitoring in the COMBINE Programme of HELCOM
206 Manual for Marine Monitoring in the COMBINE Programme of HELCOM
208 Manual for Marine Monitoring in the COMBINE Programme of HELCOM

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**Chemical parameters**

<table>
<thead>
<tr>
<th>Substance Description</th>
<th>Analysis Method</th>
<th>Research Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polybrominated diphenyl ethers (PBDE)</td>
<td>GC-MS</td>
<td>Research procedure</td>
</tr>
<tr>
<td>Hexabromocyclododecane (HBCDD)</td>
<td>LC-MS</td>
<td>Research procedure</td>
</tr>
<tr>
<td>Perfluorooctane sulfonate (PFOS)</td>
<td>GC-MS</td>
<td>Research procedure</td>
</tr>
<tr>
<td>Dioxins, furans and dioxin-like PCBs</td>
<td>HRGC-HRMS</td>
<td>Research procedure</td>
</tr>
<tr>
<td>Diclofenac</td>
<td>GC-MS</td>
<td>Research procedure</td>
</tr>
<tr>
<td>17-alpha-ethinylestradiol</td>
<td>GC-MS</td>
<td>Research procedure</td>
</tr>
<tr>
<td>Cadmium and its compounds</td>
<td>Atomic absorption spectrometry (AAS) with non-flame atomization</td>
<td>Research procedure based on PN-EN ISO 15586</td>
</tr>
<tr>
<td>Lead and its compounds</td>
<td>Inductively coupled plasma optical emission spectrometry (ICP-OES)</td>
<td>Research procedure based on PN-EN ISO 11885</td>
</tr>
</tbody>
</table>


The COMMON SENSE project has received funding from the European Union’s Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.
<table>
<thead>
<tr>
<th>Substance</th>
<th>Methodology</th>
<th>Research procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amalgamation of mercury vapors</td>
<td>Inductively coupled plasma mass spectrometry (ICP-MS)</td>
<td>Research procedure based on PN-EN ISO 17294-2</td>
</tr>
<tr>
<td>Mercury and its compounds</td>
<td>Atomic fluorescence spectrometry (AFS)</td>
<td>Research procedure based on PN-EN ISO 17852 or other research procedure</td>
</tr>
<tr>
<td>Polycyclic aromatic hydrocarbons (PAHs)</td>
<td>Liquid chromatography (HPLC, UPLC)</td>
<td>Research procedure based on PN-EN ISO 17993 or other research procedure (for UPLC)</td>
</tr>
<tr>
<td></td>
<td>RP HPLC with spectrofluorometric detection or UV-VIS</td>
<td>Research procedure based on GIOS-008.95-WS.3</td>
</tr>
<tr>
<td>Benzo(a)pyrene</td>
<td>HPLC, UPLC</td>
<td>Research procedure based on PN-EN ISO 17993 or other research procedure (for UPLC)</td>
</tr>
<tr>
<td></td>
<td>GC-MS</td>
<td>Research procedure</td>
</tr>
<tr>
<td>Benzo(b)fluoranthene</td>
<td>HPLC, UPLC</td>
<td>Research procedure based on PN-EN ISO 17993 or other research procedure (for UPLC)</td>
</tr>
<tr>
<td></td>
<td>GC-MS</td>
<td>Research procedure</td>
</tr>
<tr>
<td>Benzo(k)fluoranthene</td>
<td>HPLC, UPLC</td>
<td>Research procedure based on PN-EN ISO 17993 or other research procedure (for UPLC)</td>
</tr>
<tr>
<td></td>
<td>GC-MS</td>
<td>Research procedure</td>
</tr>
<tr>
<td>Benzo(g,h,i)perylene</td>
<td>HPLC, UPLC</td>
<td>Research procedure based on PN-EN ISO 17993 or other research procedure (for UPLC)</td>
</tr>
<tr>
<td></td>
<td>GC-MS</td>
<td>Research procedure</td>
</tr>
<tr>
<td>Fluoranthene</td>
<td>HPLC, UPLC</td>
<td>Research procedure based on PN-EN ISO 17993 or other research procedure (for UPLC)</td>
</tr>
<tr>
<td></td>
<td>GC-MS</td>
<td>Research procedure</td>
</tr>
<tr>
<td>Indeno(1,2,3-cd)pyrene</td>
<td>HPLC, UPLC</td>
<td>Research procedure based on PN-EN ISO 17993 or other research procedure (for UPLC)</td>
</tr>
<tr>
<td></td>
<td>GC-MS</td>
<td>Research procedure based on PN-EN ISO 10695</td>
</tr>
<tr>
<td></td>
<td>GC</td>
<td>Research procedure</td>
</tr>
<tr>
<td></td>
<td>GC-MS</td>
<td>Research procedure</td>
</tr>
</tbody>
</table>
Metabolites of polycyclic aromatic hydrocarbons | Liquid chromatography with fluorescence detector (HPLC-F) | Research procedure based on PN-EN ISO 17993
---|---|---
Tributyltin compounds (Tributyltin cation) | GC | Research procedure based on PN-EN ISO 17353
 | GC-MS | Research procedure
Polychlorinated biphenyls (PCB) | GC | Research procedure based on PN-EN ISO 6468
 | LC-MS | Research procedure
 | GC-MS | Research procedure
Cesium-137 | Gamma-ray spectroscopy using semiconductor germanium detector | Research procedure

### 6.9.5 Monitoring data – storage and dissemination

Databases on monitoring measurements in the framework of PMŚ are stored in two entities:

1. IMGW-PIB, Gdynia – Oceanographic Database (*Baza Danych Oceanograficznych*)
2. GIOŚ.

Furthermore, GIOŚ is also responsible for dissemination of results on measurements and assessments of the status of transitional and coastal waters within PMŚ (Table 21).

*Table 21. Dissemination of results of monitoring measurements in PMA*

<table>
<thead>
<tr>
<th>Entity disseminating results</th>
<th>Form of dissemination</th>
<th>Minimal frequency of dissemination</th>
<th>Addressee of results</th>
</tr>
</thead>
<tbody>
<tr>
<td>GIOŚ</td>
<td>GIOŚ website</td>
<td>Annual update</td>
<td>Government and local administration, universities, schools, libraries, society</td>
</tr>
<tr>
<td>GIOŚ</td>
<td>Cruise reports on GIOŚ website</td>
<td>After each cruise</td>
<td></td>
</tr>
</tbody>
</table>

Results obtained within PMŚ are submitted by GIOŚ, once a year, to HELCOM and European Commission/European Environmental Agency (in the adequate file form; figure 20).
Figure 20. The flow of the information on the quality of the marine waters of the Baltic Sea according to “Program Państwowego Monitoringu Środowiska na lata 2013-2015”\textsuperscript{210}

6.10 Results of the MSFD implementation

MSFD was transposed to Polish legislation\textsuperscript{211} by act of Parliament on 4\textsuperscript{th} January 2013 amending the act ‘Water law’ and some other acts (Dz.U.\textsuperscript{212} poz.165\textsuperscript{212}) by introducing new chapter entitled: ‘Protection of marine environment’ including description and way of realization of tasks of which the marine strategy consists. The aim of marine strategy is to achieve the good state of marine environment till 2020.

Implementation of the marine strategy consists of the following elements:

1. preparing of the preliminary assessment of the state of the marine environment;


\textsuperscript{212} Ustawa z dnia 4 stycznia 2013 r. o zmianie ustawy – Prawo wodne oraz niektórych innych ustaw, Dz. U. 2013 poz. 165.
2. determination of characteristics of the good environmental status;
3. determination of the environmental targets and the relevant indicators;
4. determination and implementation of the monitoring programme;
5. determination and implementation of the national programme of marine water protection.

All the named above elements, i.e. assessment, GES characteristics of, environmental targets and indicators as well as programmes, are subject of reports to European Commission and actualization every six years. Realization of the mentioned above tasks needs participation by relevant environmental authorities but also authorities linked to infrastructure and agriculture.

In Poland recommendations of MSFD were transformed to the Polish Water Law (Prawo Wodne), legislation originating from 1922, with further supplements, since 1962 in the range of Polish Parliament legislation. Art 8 MSFD was transformed to art.61h and art 61i of the above law, art.9 to art 61k and art 61l, art.10 to art 61n and 61o, respectively. Obligations resulting from implementation of MSFD are distributed between Główny Inspektorat Ochrony Środowiska (GIOŚ - Chief Inspectorate of Environmental Protection), which subordinates to Ministry of Environment - arts. 8, 9 and 11 of MSFD to National Board of Water Management – arts 10,13 and 14. Minister appropriate to maritime management had to present report about dominating pressures and impacts, and economical and social analysis of usage of marine waters and costs of their degradation, and Minister appropriate to fishery matters had to present report on pressures and impacts on the sea as result of fisheries. At present the leading institution in Poland is the Ministry of Environment, the cooperating institutions are: Ministry of Economy, Ministry of Agriculture and Rural Development, and the Ministry of Infrastructure and Development.

All the tasks of governmental and self-governmental from the scope of environmental protection, especially: National programme of municipal sewage treatment, Water-environmental programme of Poland, Programme of protection of species and habitats, Common Agricultural Policy, Common Fisheries Policy, Integrated Maritime Policy should contribute to the realization of MSFD objectives.

**Position of Polish Government**213:

Polish Government confirms that state of the marine environment of Polish territorial, Polish exclusive economic zone and coastal is characterized by sub-GES state. Nutrient levels causing eutrophication and concentrations of hazardous substances are above limits. In the Polish marine areas are sites of incidental anoxia causing a decrease of biodiversity and degradation

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of ecosystems. However, it should be underlined that used in the Baltic at present the ecosystem models confirm the inert reaction of marine environment to the former remediation, especially in reduction of eutrophication, that is why the ambitious aim of the MSFD to achieve by 2020 good environmental state of the marine waters needs revision based on the current information on their state.

European Commission in the Report indicates no logic coincidence between initial assessment, determination of GES and environmental targets. The Polish Government when determining environmental targets for marine waters applied both what was needed for the Directive’s Initial Assessment and the set of characteristics typical for good environmental state of the marine waters, to assure coherency across all the elements of marine strategy.

Polish Government supports recommendations of the Commission concerning further activities for implementation of MSFD, i.e.: Monitoring of marine waters adjusted to requirements of the MSFD for

1. successive elimination of deficiencies and gaps in environmental data identified during preparation of the initial assessment of marine waters,
2. applying norms originating from already introduced EU legislation and indicators determined for particular regions, determined in framework of regional marine conventions.

However, the opinion of the Polish Government is that during the time of economic crisis, which is clearly discernible across the EU, one should aim to limit administrative, operational and economic obligations put on Member States in connection with implementation of this Directive by assuring that EC provides clear guidelines concerning classification and evaluation system as well as methodological standards.

In agreement with above sentiment, the Polish Government supports the idea of the EC decision concerning revision of Commission Decision 2010/477/EU of 1st September 2010 on criteria and methodological standards of good environmental state\(^\text{214}\) in cases where such revision will contribute to the simplification of the criteria and assure the possibility of adjustment of criteria and indicators specific to particular marine regions.

The Polish Government does not support the plans of Commission in the scope of revision of the Annex III to Directive resulting in actualization of the Initial Assessment already in 2018, indicating simultaneously to the risk of disorder in both study and research work of experts, in

the country and at the level of marine region. Changes in Annexes of Directive need transposition to national legislation and due to that may cause report cycle in 2018.

The Polish Government supports recommendation of Commission to implement to the national legislation the results of work and agreements achieved in framework of the regional conventions. Polish Government systematically takes part in all works carried on at all levels and in structures of Helsinki Commission from decision through working/programming to strictly expert ones.

This position of Polish Government is available on webpage of Ministry of Environment\textsuperscript{215}.

7 IMPLEMENTATION OF MSFD IN SPAIN

7.1 Marine waters management in Spain

Public administration bodies which have authority in marine waters management in Spain are summarized in the following figure.\textsuperscript{216, 217}

Spanish jurisdictional marine waters management is distributed, in Spain, among different Ministries according to both:

1. main protection and management powers assigned to the Ministry of Agriculture, Food and Environment and the Ministry of Public Works,

\textsuperscript{216} Interview to Ms. Ainhoa Pérez Puyol and Ms. Sagrario Arrieta Algarra (Directorate General for the Sustainability of the Coast and the Sea - Ministry of Agriculture, Food and Environment) carried out within the framework of WP1.1 of the COMMON SENSE Project. July 2014.

\textsuperscript{217} La Moncloa website: \url{http://www.lamoncloa.gob.es/home.htm}

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2. and additional complementary powers assigned to other Ministries depending on the sector affected (e.g. tourism, social policy, research, etc.) and on the pressure/impact posed.

Concerning the Autonomous Communities, they have mainly competences in:

1. coastal and transitional waters (including the coordination, representation and implementation of the WFD);
2. aquaculture;
3. land-based pollution sources and discharges;
4. and marine protected areas with land-ecological continuity.

It has to be mentioned that although Autonomous Communities have the authority on coastal and transitional waters, since MSFD is addressed at MS level, the Government of Spain coordinates and implements the MSFD within these areas in cooperation with the Autonomous Communities.

Herein are listed the main competences of the Government of Spain (La Moncloa):

I. The Ministry of Agriculture, Food and Environment (Ministerio de Agricultura, Alimentación y Medio Ambiente).

1. Secretary of State for Environment (Secretaría de Estado de Medio Ambiente).
   a. General Sub-Directorate of maritime-terrestrial domain (Subdirección General de Dominio Público Marítimo-Terrestre)

Head of the department: Ms. Raquel Orts Nebot (BOE 24-12-2012)

Tasks/functions:
   i. To coordinate the actions and projects that contribute to the costal and marine sustainability improvement, together with the autonomous communities, local authorities and public organisms.
   ii. To determinate the public maritime-terrestrial domain by means of the demarcation process and the necessary measures to ensure its integrity and conservation.
   iii. To manage the public maritime-terrestrial domain, in particular, of the occupation, use, custody and police.
   iv. To issue the report on the reservation of the public maritime-terrestrial domain.

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218 La Moncloa website: http://www.lamoncloa.gob.es/home.htm
219 Ministerio de Agricultura, Alimentación y Medio Ambiente.
v. To assign the public maritime-terrestrial domain goods to the autonomous communities in order for them to expand, modify or build new ports or transport routes.

vi. To manage management the economic and financial framework of the public maritime-terrestrial domain.

vii. To carry out the operational management of the districts and provincial services costs.

b. General Sub-Directorate for Coastal Protection (Subdirección General para la Protección de la Costa)

Head of the department: D. Ángel Muñoz Cubillo (BOE 24-12-2012)

Tasks/functions:

i. To coordinate the actions and projects that contribute to the coastal and marine sustainability improvement, together with the autonomous communities, local authorities and public organisms.

ii. To conserve and protect those elements that integrate the public maritime-terrestrial domain, specially, beaches sustainability, dune systems and littoral wetlands.

iii. To schedule, monitor and assess projects financed by European funds.

iv. To coordinate the implementation of integrated coastal zone management in Spain.

Division for the Protection of the Sea (División para la Protección del Mar)

Head of the department: Dª Ainhoa Pérez Puyol (BOE 12-04-2013)

Tasks/functions:

i. To coordinate, together with the autonomous communities, local authorities and public organisms of actions and projects that contribute to improve the sustainability of the coast and the sea.

ii. To carry out the functions arising from the powers that the Law 41/2010, of December 29th, of the marine environment protection attributed to the Ministry of Agriculture, Food and Environment specifically in relation to the Marine Strategies, Marine Protected Areas Network, marine habitats and species and mandatory reports concerning discharges, activities and projects carried out within the marine environment.

iii. To carry out the functions arising from the competences that the article 6 of the Law 42/2007, of December 13th of the Natural heritage and Biodiversity attributed to the Government of Spain with regard to space, habitats/marine areas and marine species,
as well as the development and update of the Spanish Marine habitats and Species Inventory.

iv. To declare and manage marine protected areas, Natura 2000 Network sites, marine areas protected under international regulatory framework and other natural spaces managed by the General State administration.

v. To participate in representation of the Ministry in international organisms and the monitoring of international conventions related to marine environment protection.

vi. To formulate, adopt and monitor strategies, plans, programs and measures for the conservation of biological diversity and resources of the marine environment, particularly with regards to threatened species and marine habitats in coordination, if necessary, with other organs/departments with jurisdiction on this matter.

vii. To develop previous reports for the environmental impact assessment process related to marine and coastal environment.

viii. To develop or manage studies, proposals and plans in terms of coastline protection against accidental marine pollution and in particular the proposal for a comprehensive contingency plan for actions on the littoral and marine pollution reaction training.

ix. To collaborate with the Ministry of Public Works to enhance the protection of the seashore.

x. To coordinate the work done with RSCs.

xi. To implement the MSFD and WFD, and other EU marine protection related policies. For the WFD the division is in charge of the coordination of the Autonomous Communities implementation work and Spanish representation in the EC.

xii. To monitor coastal accidental pollution.

II. Ministry of Public Works (Ministerio de Fomento) 220

1. General Secretary for Transport (Secretaría General de Transporte).

a. General Directorate for Merchant Marine (Dirección General de la Marina Mercante).

   ▪ The General SubDirectorate for Maritime Security, Pollution and Inspection (Subdirección General de Seguridad, Contaminación e Inspección Marítima) is in charge of the following functions related to life safety and sea navigation:

   i. Human lives rescue, water cleaning operations and fight against marine pollution.

   ii. Human lives and navigation safety.

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220 Ministerio de Fomento.

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iii. Control of the situation, register and flagging of civil vessels. Vessels dispatch regulation, rescue, towing, finding and marine extractions.

iv. Management and control of maritime traffic.

v. Register and control of civilian marine personnel, control of minimum endowment of civil vessels, determination of the suitability of general vessels conditions, professionalism and qualifications to be part of civil Spanish vessels’ crew.

vi. Participation in the Lighthouse Board or other institutional collaboration instruments on maritime signalling in order to contribute to the determination of technical characteristics and operating performance and correct location of the signals and the coordination of maritime signalling systems together with the support of other active navigation systems.

- The General Sub Directorate for Maritime Regulation and International Cooperation (Subdirección General de Normativa Marítima y Cooperación Internacional) is mainly in charge of tasks related to disciplinary proceedings (initiation, processing and resolution), tariff system, all kind of maritime related services, coordination of international relationships of shipping activities in Spain, juridical support to the GD Merchant Marine and marine normative development, among others.

- The General Sub Directorate for Administrative Management and Coordination (Subdirección General de Coordinación y Gestión Administrativa) is in charge of personnel management related issues, IT matters and property, economic, financial and budgetary regimes.

In addition, the following two organizations are included in this section since they are key entities for the implementation of the MSFD in Spain:

**Centre for studies and experimentation on public works – CEDEX** (Centro de Estudiosy Experimentación de Obras Públicas)

CEDEX contributes with technical assistance in the civil engineering and marine environment fields. This assessment is mainly required by the Ministry of Public Works and the Ministry of Agriculture, Food and Environment, among other public and private institutions. Technical support is provided within the following fields:
i. Ports, coast and estuaries: marine engineering, coastal waters quality and dynamics, and problems related to dredging.

ii. Hydraulic power planning, hydrology, continental water engineering and resource quality.

iii. Design, construction and exploitation of road networks: traffic engineering and road safety.

iv. Environmental engineering: data acquisition, diagnosis, prevention and/or troubleshooting under specialized and multidisciplinary approach.

v. Physic, electronic and computational analysis.

vi. Properties and application of building materials; materials science and experimental studies of analysis of structures.

vii. Geotechnical Engineering: foundations, earth structures, soil and rocks mechanics.

viii. Historic studies of public works and urban planning.

In addition, CEDEX carries out an important technology transfer function by means of the following:

i. Training activities: master, courses, workshops, etc.

ii. Information and documentation activities: documents development, technical reports, publications, databases elaboration and management, availability of and extensive technical and scientific library collection.

iii. Active participation in national and international networks.

iv. Disseminate, through technical activities their own technology.

CEDEX develops other complementary activities such as the elaboration of technical normative, homologation and certification and the acquisition of commercial patents, among others.

**The Oceanographic Institute of Spain (Instituto Español de Oceanografía- IEO)**

The IEO focuses on marine research and technological development, including knowledge transference (Royal Decree 718/2010\(^\text{221}\)) by means of the following functions:

\(^{221}\) [http://www.ieo.es/documents/10192/26809/RD_718_2010_modificacion_IEO.pdf/a3af9b6-2c54-40fe-9d31-87135af67143](http://www.ieo.es/documents/10192/26809/RD_718_2010_modificacion_IEO.pdf/a3af9b6-2c54-40fe-9d31-87135af67143)
i. To develop, coordinate and manage research and development projects on marine living resources within different oceans and seas. This includes research and technological development of marine living resources farming focusing on those resources of the fisheries sector interest.

ii. To develop, coordinate and manage multidisciplinary oceanographic research programs, especially on marine living resources.

iii. To represent the Government of Spain in different scientific oceanographic and fisheries targeted forums in coordination with both the Ministry of External Affairs and Cooperation and the Ministry of Agriculture, Food and Environment.

iv. The IEO is considered/consulted when establishing fisheries protected zones, marine protected areas and other kind of spaces.

v. To inform to the competent authorities on research campaigns applications presented by third countries.

vi. To collaborate with public and private organizations, both national and international, in order to develop research projects and other scientific and technological activities to address the research objectives set by the fisheries policy in Spain.

vii. To cooperate and coordinate international research programs.

viii. To tackle fisheries and oceanography research priority objectives set by fisheries policies in Spain.

7.2 Implementation process, competent authorities and regulatory framework

The MSFD (Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008) was transposed in Spain, in the year 2010, by means of the Marine Environment Protection Law (Ley 41/2010, de 29 de diciembre, de Protección del Medio Marino\textsuperscript{222}). The main objective of this law is to reach or keep a Good Environmental Status (GES) by 2020. With this aim in view marine strategies are developed constituting the planning tools for the marine environment.

The Ministry of Agriculture, Food and Environment (Ministerio de Agricultura, Alimentación y Medio Ambiente – MAGRAMA\textsuperscript{223}) is the authority responsible for the MSFD implementation in Spain.

The MSFD requires an ecosystem approach applying scientific methods for the biological organization including processes, functions and interactions between organisms and their

\textsuperscript{222} Ley 41/2010, de 29 de diciembre, de protección del medio marino.  

\textsuperscript{223} Ministerio de Agricultura, Alimentación y Medio Ambiente.  
environment. Human beings are included as a part of this wide definition of ecosystem. This approach helps to create equilibrium between conservation and sustainable uses of natural resources.

The JRC tasks groups (TG) have generated a report for every Descriptor in order to advise on criteria and methodological standards concerning GES definition. Based on these reports and on consultation made to the Regional Seas and the Member States, the European Commission has published the COMMISSION DECISION of 1 September 2010 on criteria and methodological standards on good environmental status of marine waters (2010/477/EU). The 2010/477/EU establishes the specific attributes associated to every criteria and, when possible those criteria include the applicable standards.

The marine strategies had to be developed for all the marine areas under Spanish sovereignty and jurisdiction (territorial sea, Economic Exclusive Zone, continental platform and the Mediterranean fisheries protection zone), including more than 1 million Km2. In order to make the implementation process easier, the Marine Environment Protection Law divides the Spanish marine environment into five marine divisions: North Atlantic, South Atlantic, Estrecho and Alborán, Levantino-Balear and Canary. From each of these divisions a marine strategy will have to be developed and updated every 6 years.

The Ministry of Agriculture, Food and Environment (Ministerio de Agricultura, Alimentación y Medio Ambiente) by means of the Division for Sea protection (División para la Protección del Mar), lead by Ms. Ainhoa Pérez, was in charge of developing and implementing marine strategies and they have been carried out in cooperation with the following organizations:

1. Spanish Oceanographic Institute (Instituto Español de Oceanografía - IEO), who was mainly in charge of descriptors monitoring and Good Environmental Status definition.

2. The following organisms are contracted by the Ministry of Agriculture, Food and Environment to participate in the MSFD implementation:
   i. CEDEX who was mainly in charge of providing information on human activities, pressures and impacts.
   ii. An environmental economist who developed the socio-economic analysis.
   iii. TRAGSATEC S.A. that provided technical assistance.

In this sense, Spain has developed marine strategies for the 5 marine sub-divisions mentioned in the section 7.3 of this report. Concerning the marine strategies different analysis were developed in order to cover the essential features and characteristics of the Spanish water bodies, predominant pressures and impacts, economic and social issues, GES definitions and the establishment of environmental targets and indicators.
These analyses took into account elements related to coastal waters, transition waters and territorial waters affected by EU legislation.

The Marine Environment Protection Law states that the sectoral policies affecting the marine environment will have to be compatible and to be adapted to the marine strategies objectives. This implies an active participation and collaboration of those Administrations that develop activities within the marine environment framework. In order to facilitate the national coordination for the implementation of the marine strategies, and according to the article 22 of the Marine Environment Protection Law, it has been created the **Inter-ministerial Commission of Marine Strategies**\(^{224}\) (CIEM - in Spanish) that aims at coordinate the development, implementation and monitoring of the marine environment planning.

The Inter-Ministerial Commission was constituted on June 2012 and is composed by:

1. The Presidency led by the Secretary of State of Agriculture, Food and Environment, currently Mr. Federico Ramos de Armas.
2. The Vicepresidency, led by the head of the General Directorate for the Sustainability of the Sea and the Coast of the Ministry of Agriculture, Food and Environment, currently Mr. Pablo Saavedra Inaraja.
3. The Vocals include:
   i. Two representatives, with a minim rank of General Director or equivalent, of the following Ministries: the Ministry of Public Works, Ministry of Economy and Competitiveness, Ministry of Industry or Energy and Tourism or Ministry of Agriculture, Food and Environment.
   ii. Two representatives, with a minim rank of General Director or equivalent, of the following Ministries: Ministry of Defence, Ministry of Foreign Affairs and Cooperation, Ministry of Home Affairs, Ministry of Finance and Public Administration, Ministry of Education, Culture and Sports and Ministry of Health, Social Services and Equality.
4. The Secretary is led by the head of the General Sub-Directorate for the Coastal Protection, currently, Mr. Ángel Muñoz Cubillo.

**External advisors could be invited to the CIEM in order to discuss specific issues.**

The role and tasks to be developed by the Inter-Ministerial Commission will be the following:

1. The analysis and assessment of the information provided by the different Ministries to be used for the definition of the marine strategies.

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2. The exchange of information concerning installations, projects and sectoral plans exchange located/affecting/foreseen in the marine environment aiming at ensuring the coherence within marine divisions.

3. The analysis of the different components of the marine strategies developed by the Ministry of Agriculture, Food and Marine Environment as well as the coordination of the Ministries participation into the Commission of the Initial Assessment of the environmental status.

According to the article 10.3. of the Marine Environment Protection Law the environmental objectives of the marine strategies set by Spain, together with the definition of the GES have been approved by the Resolution of the State Secretary for Environment and as approved by the Council of Ministers on the 2nd of November of 2012, and the environmental objectives for all the different Spanish marine divisions were included as an annex. Hence, environmental targets and associated indicators have a certain legal value.

Around 500 experts, from public and private organizations, were involved in the Spanish Marine Strategies development process contributing with different inputs.

Member States will have to implement a Monitoring Program by 2014 based on the initial assessment and aiming at assessing the permanent marine waters environmental status. Moreover, they will have to develop a Measures Program in order to reach or maintain the GES whose implementation will start in 2016.

On April 2014 Marine Strategy Monitoring Committees are officially created by means of the Order AAA/705/2014, of 28 April, by which create the Committees of Follow-up of the marine strategies and regulates his composition, functions and diet of operation of the mentioned committees (BOE of 3 May).

In September 2014, the MSFD Monitoring Committee for the North-Atlantic sub-division was created in order to promote the implementation of this Directive within Cantabria, Asturias, Galicia and Basque Country autonomous communities. It is expected that the other regional committees will be created in the following months.

229 i-ambiente http://www.i-ambiente.es/?q=noticias/espana-proteccion-marina-es-responsabilidad-comparsa-con-las-ccaa#sthash.LUoKCO4V.dpuf
The monitoring program will have to make the most of the existing monitoring experiences that have been carried out in order to comply with the WFD, the HD, the BD, the PPC and Regional Conventions, among others. With this aim in view the Ministry of Agriculture, Food and Environment is working on a detailed inventory of the existing monitoring programmes and their characteristics. They are gathering the information by means of a questionnaire that has been sent to those organizations that are currently carrying out marine monitoring.230 This inventory will be published by July 2014 in order to characterize the existing monitoring effort made in Spain and to identify which of the existing monitoring practices actually cover part of the MSFD monitoring objectives. The Ministry has received more than 300 answers to the questionnaire and they will publish the indicators included in the monitoring program and the analysis of this program231.

This inventory will allow identifying the monitoring gaps within the Spanish waters territory and will help, together with marine strategies information, to define the monitoring program that Spain will publish by October 2014. The implementation of this program will start from this date on and it will be updated according to the different progresses made in terms of RSCs coordination and technological advances.232

Concerning the following steps, Spain is planning to create a database platform in order to unify marine monitoring arising data being interoperable with other data platforms such as OSPAR database and WISE-WFD database233 marine database according to the Aarhus Convention.

The United Nations Economic Commission for Europe Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters, or Aarhus Convention, and its Protocol on Pollutant Release and TransferRegisters (PRTRs), guarantees effective access to information, public participation and access to justice as essential issues for transparent and accountable governance, for high quality outcomes of the decision-making and to strengthen trust of public in governing institutions. This Convention entered into force on 30 October 2001.234

Among the following steps to be taken, the Ministry of Agriculture, Food and Environment are working on establishing synergies among different sectors, activities and practices in order to

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230 Ministry of Agriculture, Food and Environment
231 Interview to Ms. Ainhoa Pérez Puyol and Ms. SagrarioArrietaAlgarra (Directorate General for the Sustainability of the Coast and the Sea- Ministry of Agriculture, Food and Environment ) carried out within the framework of WP1.1. of the COMMON SENSE Project. July 2014.

The COMMON SENSE project has received funding from the European Union’s Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.
make the most of the efforts made by the different actors involved in the MSFD implementation.\textsuperscript{235}

The following figure summarizes the MSFD implementation process in Spain.

\textsuperscript{235} Interview to Ms. Ainhoa Pérez Puyol and Ms. Sagrario Arrieta Algarra (Directorate General for the Sustainability of the Coast and the Sea- Ministry of Agriculture, Food and Environment ) carried out within the framework of WP1.1. of the COMMON SENSE Project. July 2014.

The COMMON SENSE project has received funding from the European Union’s Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.
The COMMON SENSE project has received funding from the European Union’s Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.
7.3 Spain marine regions

Marine waters in Spain are part of Mediterranean and the North East Atlantic regions (covering the following two sub-regions: the Bay of Biscay and the Iberian coast and the Macaronesia (the Canary Islands).

Within these regions, and sub-regions the following sub-divisions were established by Spain for the implementation of the MSFD:

1. “The North Atlantic division: it includes the marine waters under Spanish jurisdiction between the northern limit of the territorial waters between Spain and Portugal and the limit of the territorial waters between Spain and France in the Bay of Biscay. It extends over four autonomous regions: Galicia, Asturias, Cantabria and the Basque Country, and seven provinces: A Coruña, Pontevedra, Lugo, Asturias, Cantabria, Guipúzcoa and Vizcaya.

2. The South Atlantic division: it includes marine waters between the limit of the territorial waters between Spain and Portugal in the Gulf of Cadiz and the meridian passing through Cape Spartel (Morocco). It extends over two provinces of the Autonomous Community of Andalusia Cadiz and Huelva.

3. Estrecho and Alborán: it includes the marine waters under Spanish jurisdiction between the meridian passing through Cape Spartel and an imaginary line oriented 128° to the meridian passing through Cape Gata, and the Spanish marine waters in the area of Ceuta, Melilla, Chafarinas Islands, the islet Perejil, Peñones de Vélez de la Gomera and Alhucemas and Alboran Island. It stretches over four provinces of the Autonomous Community of Andalusia Almeria, Granada, Malaga and Cadiz and the autonomous cities of Ceuta and Melilla.

4. The Levantino-Balear division: it includes the Spanish marine waters between the imaginary line oriented 128° to the meridian passing through Cape Gata and the limit of the territorial waters between Spain and France in the Gulf of Lions. The division extends over five Autonomous Communities (Catalonia, Valencia, Balearic Islands, Murcia and Andalusia) and nine provinces (Barcelona, Girona, Tarragona, Alicante, Castellón, Valencia, Balearic Islands, Murcia and Almeria).

5. The Macaronesia (Canary) division: it includes the Spanish marine waters around the Canary Islands. It extends over two provinces of the Autonomous Community of the Canary Islands: Las Palmas and Santa Cruz de Tenerife.”

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236 Milieu Ltd Consortiu. Technical Assessment of the MSFD 2012 obligations, Spain. 7 February 2014.
Figure 23. Indicative map of the marine sub-divisions established in Spain for the MSFD implementation.
Note: this map does not show the official neighbouring limits.  

7.4 Cooperation with other regions

Spain is member of OSPAR and the Barcelona Convention. The mentioned Conventions are implemented by means of Decisions, Recommendations and Agreements. Decisions are binding and the recommendations establish actions to be developed by the Contracting Parties. These measures are complemented by agreements that tackle other issues, monitoring programs, guidelines, methodological guides, etc. Contracting parties of Regional Seas Conventions meet every year, and every 5 years they have a Ministerial meeting of the parties.

Both the OSPAR and the Barcelona Convention have accomplished, with some exceptions, heavy metals and nutrients MSFD monitoring targets.  

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238 Interview to Mr. Víctor Escobar (Chairman of the OSPAR Commission) carried out within the framework of WP1.1. of the COMMON SENSE Project. July 2014.

The COMMON SENSE project has received funding from the European Union's Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.
7.4.1 OSPAR Convention

The National Contact Point for OSPAR in Spain is Ms. Ainhoa Pérez Puyol of the Ministry of Agriculture, Food and Environment\(^{239}\).

The Joint Assessment and Monitoring Programme (JAMP) for the period 2012-2014 was adopted by the Ministerial meeting of the Commission in 2010. This programme sets the framework to develop OSPAR’s monitoring assessments focusing on the MSFD implementation.

The JAMP strategy comprises:

1. The Coordinated Environmental Monitoring Programme (CEMP) is the marine monitoring programme that studies the pollution temporal tendencies (annual samplings are made) and the spatial pollution distribution carried out every 5 years.

2. The Comprehensive Atmospheric Monitoring Programme (CAMP) aims at assessing the inputs of certain pollutants in the OSPAR area by means of atmospheric deposition. The CAMP forces to carry out the monitoring, among other, of certain heavy metals (arsenic, cadmium, copper, chrome, lead, mercury and zinc) and nitrogen compounds present in the air and that precipitate. These contaminants are still to be assessed in Spain.

3. The Comprehensive Study of Riverine inputs and Direct Discharges (RID) programme controls discharges from rivers to the sea. The RID forces Member States to inform on industrial and urban riverine and direct discharges to the sea. Selected contaminants (Hg, Cd, Cu, Zn and Pb) and nutrients (ammonia, Nitrates, N and P), among others are included in this programme. These also include supporting parameters such as salinity and freshwater flow.

In 2010, OSPAR published the Quality Status Report\(^{240}\)(QSR 2010) on the quality of the OSPAR marine environment and this is available online. This report includes the effort made by contracting Parties during the period 1998 to 2008 to manage monitor and assess pressures on OSPAR area ecosystem. The first Quality Status Report was developed in 2000. The QSR 2010 includes five thematic strategies, among them:

1. The Eutrophication Strategy:
   
   i. **Combat eutrophication in the OSPAR maritime area in order to achieve and maintain, by 2010, a healthy marine environment where eutrophication does not occur.**

   ii. **Reduce inputs of nitrogen and phosphorus to areas affected by or likely to be affected by eutrophication in the order of 50% compared to 1985.**\(^{241}\)

Apart from the QSR 2010 the following documents within the OSPAR framework could help to the implementation of the monitoring of eutrophication parameters within the MSFD:

i. **OSPAR (1997a, b, c, d & e\(^{242}\)) has developed eutrophication monitoring guidelines, among others for nutrients and oxygen.**

\(^{239}\) Ms Ainhoa Pérez Puyol. Ministry of Agriculture, Food and Environment. Tel: +34 597 6463. E-mail: appuyol@magrama.es


ii. Monitoring data are used in the Common Procedure (OSPAR, 2005) for the identification of the eutrophication status and for the calculation of the relevant to nutrients, Ecological Quality Objectives (EcoQO) (OSPAR, 2009a).

iii. OSPAR, through its Joint Assessment and Monitoring Programme (JAMP), has developed guidelines for monitoring contaminants in biota and sediments.

iv. Nutrients monitoring in the seawater is also covered by this convention.

v. Other references point to external literature are found in OSPAR’s QSR 2010.

2. The Hazardous Substances Strategies (including heavy metals):
   i. Move towards the cessation of discharges, emissions and losses of hazardous substances by 2020.

   ii. OSPAR countries were required to implement best available techniques and best environmental practices and to achieve specified limit values for emissions and discharges for major industrial sources e.g. heavy metals.

   iii. The ultimate aim is to achieve concentrations of hazardous substances in the marine environment near background values for naturally occurring substances and close to zero for man-made substances.

   iv. Other references point to external literature are found in OSPAR’s QSR 2010.

3. Concerning underwater noise OSPAR states the following in the QSR 2010 report:
   i. Levels of underwater noise are thought to be increasing internationally. Regions II and III seem to be the most affected by noise-generating human activities and there are signs of effects on marine life. Levels of noise in Regions II and III are likely to increase. OSPAR

242 OSPAR 1997a. JAMP eutrophication monitoring guidelines – nutrients (agreement 1997-2)
http://www.ospar.org/documents/dbase/decrecs/agreements/97-02e.doc
OSPAR 1997b. JAMP eutrophication monitoring guidelines - chlorophyll a (agreement 1997-4)
http://www.ospar.org/documents/dbase/decrecs/agreements/97-04e.doc
OSPAR 1997c. JAMP eutrophication monitoring guidelines – benthos (agreement 1997-6)
http://www.ospar.org/documents/dbase/decrecs/agreements/97-06e.doc
OSPAR 1997d. JAMP eutrophication monitoring guidelines - phytoplankton species composition (agreement 1997-5)
http://www.ospar.org/documents/dbase/decrecs/agreements/97-05e.doc
OSPAR 1997e. JAMP eutrophication monitoring guidelines – oxygen (agreement 1997-3)
http://www.ospar.org/documents/dbase/decrecs/agreements/97-03e.doc
http://www.ospar.org/documents/DBASE/DECRECS/Agreements/05-03e_Common%20Procedure.doc
245 Interview to Mr. Víctor Escobar (Chairman of the OSPAR Commission) carried out within the framework of WP1.1. of the COMMON SENSE Project. July 2014.

The COMMON SENSE project has received funding from the European Union’s Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.
Contracting Parties should cooperate to monitor and investigate these effects and develop guidance on options for mitigation of noise and its effects.

ii. It is foreseen that by 2017 a plan for underwater noise will be published for the Atlantic region.

4. Concerning marine litter OSPAR states the following in the QSR 2010 report:

i. Marine litter is a persistent problem that affects the entire marine environment and its ecological effects are not fully understood. OSPAR should extend marine beach litter monitoring to all Regions.

ii. OSPAR has developed monitoring guidelines for marine litter on beaches (2009b) and supporting photo guides (OSPAR, 2009c,e,f). An OSPAR Fulmar EcoQO has a fully developed methodology with related monitoring guidance (OSPAR, 2008d; van Franeker et al., 2011).

iii. OSPAR should extend its marine litter monitoring on beaches to all Regions and consider including it in its Coordinated Environmental Monitoring Programme, taking into account the monitoring requirements of the EU Marine Strategy Framework Directive. This may result in a requirement to monitor the water column and the seabed. OSPAR should support the implementation of international and EU legislation, initiatives such as UNEP’s (Regional Seas Programme) work on marine litter, and ongoing research into litter in the deep sea and the ecological effects of microplastics.

iv. The identification of those areas worthy to be monitored in terms of microplastics as well as the monitoring methodologies and systems to be implemented will be defined further on, once monitoring programs have started and more information on this issue is available.

7.4.2 Barcelona Convention

The Programme for the Assessment and Control of Marine Pollution in the Mediterranean Region (MED POL) is the scientific and technical component of MAP. The MED POL collects, controls and analyses national data and prepares scientific assessment and technical reports on the state of pollution (monitoring of pollution sources and levels in the marine environment). MEDPOL also assists countries to assess and control land-based pollution and fulfil the obligations set by the Convention and its Protocols, and it organizes and carries out capacity building programmes.

Concerning the water column, UNEP MAP takes care of the monitoring of general parameters, such as temperature and Salinity, nutrients (N, P, Si) and dissolved oxygen. Concerning the determination of...
of nutrients and Chl-a, the Mediterranean laboratories are assisted to participate to proficiency tests in seawater organised by QUASIMEME. 252

Eutrophication

In the framework of the Barcelona Convention (UNEP – Mediterranean Action Plan) the TRIX (Vollenweider et al., 1998253) is proposed for assessment and monitoring of eutrophication in the Mediterranean Sea (UNEP, 2007254). It requires data on Chl-a, oxygen saturation, dissolved inorganic nitrogen and dissolved inorganic phosphorus255.

There is also a document for the SAMPLING AND ANALYSIS TECHNIQUES FOR THE EUTROPHICATION MONITORING STRATEGY OF MED POL256.

Contaminants

For the detection of site-specific temporal trends of selected contaminants, trend monitoring is used for which a Protocol on Land-Based Sources257 exists258.

7.5 Spanish marine strategies

7.5.1 Introduction

The Ministry of Agriculture, Food and Environment developed, in 2012, the following documents for each of the 5 marine sub-divisions (North Atlantic, South Atlantic, Estrecho and Alborán, Levantino-Balear and the Macaronesia-Canary) in order to develop the specific and general marine strategy for the Spanish water bodies:

1. An Initial Assessment (Article 8 of the DIRECTIVE 2008/56/EC)
   i. An analysis of the essential features and characteristics (Article 8(a) of the DIRECTIVE 2008/56/EC).
   ii. An analysis of the predominant pressures and impacts (Article 8(b) of the DIRECTIVE 2008/56/EC).
   iii. An economic and social analysis (Article 8(c) of the DIRECTIVE 2008/56/EC).

256 UNEP MAP. SAMPLING AND ANALYSIS TECHNIQUES FOR THE EUTROPHICATION MONITORING STRATEGY OF MED POL http://195.97.36.231/acrobatfiles/MTS_Acrobatfiles/mts163.pdf
257 http://195.97.36.231/dbases/webdocs/BCP/ProtocolBS96_eng_P.pdf

The COMMON SENSE project has received funding from the European Union’s Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.
2. GES definitions are presented in another additional document for each descriptor (Article 9 of the DIRECTIVE 2008/56/EC).
3. Establishment of environmental targets and indicators (Article 10 of the DIRECTIVE 2008/56/EC).
4. In addition, there are three framework documents applicable to all sub-divisions: one general, one on marine mammals and one on birds.

7.5.2 Pressures and impacts

The Approach to reporting for the MSFD document published in 2011 by the DG Environment explains the underlying rationale for the MSFD reporting framework and to the proposals for reporting sheets, among others.\(^{259}\)

<table>
<thead>
<tr>
<th>Activity</th>
<th>Pressure</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activity A Oil &amp; gas</td>
<td>Pressure X Underwater noise</td>
<td>Component A Cetaceans</td>
</tr>
<tr>
<td>Activity B Sand &amp; gravel extraction</td>
<td>Pressure Y Contamination</td>
<td>Component B Fish</td>
</tr>
<tr>
<td>Activity C Shipping</td>
<td>Pressure Z Habitat disturbance</td>
<td>Component C Seabirds</td>
</tr>
<tr>
<td>Activity D Fishing</td>
<td></td>
<td>Component D Pelagic habitat</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Component E Seabed habitat</td>
</tr>
</tbody>
</table>

**Figure 24.** Relationship between human activities, the pressures they exert on the environment and the consequent state of the environment, taking account of the impacts (adverse effects) from the pressures. Each is indicated with illustrative examples. The links to the three main elements of Article 8(1) and the associated Tables in Annex III of the MSFD are also shown.\(^{260}\)

\(^{259}\)DG Environment. Approach to reporting for the MSFD. DIKE 4/2011/02. 31/10/2011
Approach_to_reporting_for_the_MSFD.doc&ei=W8_HU9vuCOSh0QXKpoGYBg&usg=AFQjCNFaZ0sAv_MNpCmBcwBx9J0NcsYq3Q&bvm=bv.71198958,d.d2k

\(^{260}\)DG Environment. Approach to reporting for the MSFD. DIKE 4/2011/02. 31/10/2011
Approach_to_reporting_for_the_MSFD.doc&ei=W8_HU9vuCOSh0QXKpoGYBg&usg=AFQjCNFaZ0sAv_MNpCmBcwBx9J0NcsYq3Q&bvm=bv.71198958,d.d2k

The COMMON SENSE project has received funding from the European Union’s Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.
Applying this methodology the Ministry of Agriculture, Food and Environment defined pressures and impacts within Spanish marine sub-regions. There are some information gaps that they could not be covered due to time and available information limitations. There are some information gaps that they could not be covered due to time and available information limitations. These gaps are mainly related to some descriptors such as marine litter and underwater noise for which monitoring data is not available and also concerning some specific areas such as Canary since a few monitoring initiatives have been carried out so far.\textsuperscript{261}

The following table summarizes the results arising from the pressures and impacts identification analysis:

\textsuperscript{261} Ms Ainhoa Pérez Puyol. Ministry of Agriculture, Food and Environment. Tel: +34 597 6463. E-mail: appuyol@magrama.es

The COMMON SENSE project has received funding from the European Union’s Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.
Table 22. Impacts, pressures and human activities considered by the analysis²⁶²

<table>
<thead>
<tr>
<th>Impacts / Pressures</th>
<th>Human Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Submarine noise</td>
<td>Telecommunication networks</td>
</tr>
<tr>
<td>Cables and pipelines (construction)</td>
<td></td>
</tr>
<tr>
<td>Seismic surveys</td>
<td>Research</td>
</tr>
<tr>
<td>Oil exploration and exploitation</td>
<td>Energy industry</td>
</tr>
<tr>
<td>Disposal of dredged material</td>
<td>Port activity</td>
</tr>
<tr>
<td>Sand mining and sediment dredging</td>
<td>Coastal defence and ports activity</td>
</tr>
<tr>
<td>Harbour and coastal structures, marine works</td>
<td>Coastal defence, ports activity and industry</td>
</tr>
<tr>
<td>Shipping</td>
<td>Vessels traffic; goods, passengers, recreational boating, commercial fishery</td>
</tr>
<tr>
<td>Marine litter</td>
<td>Tourism; commercial forestry; Vessels traffic; goods, passengers, recreational boating, urban solid waste management</td>
</tr>
<tr>
<td>Marine litter</td>
<td>Vessels traffic; goods, passengers, recreational boating, commercial fishery</td>
</tr>
<tr>
<td>Weeds</td>
<td></td>
</tr>
<tr>
<td>Dumped munitions and munitions dumptailes</td>
<td>Military activity</td>
</tr>
<tr>
<td>Other physical disturbances</td>
<td></td>
</tr>
<tr>
<td>Offshore permanent structures</td>
<td>Safety, industry</td>
</tr>
<tr>
<td>Sand mining and sediment dredging</td>
<td>Coastal defence and ports activity</td>
</tr>
<tr>
<td>Carbon capture and storage</td>
<td>Energy industry, activities against climate change</td>
</tr>
<tr>
<td>Sea water extraction</td>
<td>Desalination, salt production and industrial refrigeration</td>
</tr>
<tr>
<td>Other physical disturbances</td>
<td></td>
</tr>
<tr>
<td>Significant changes in thermal regime</td>
<td></td>
</tr>
<tr>
<td>Thermal discharges</td>
<td>Power plants and other industries</td>
</tr>
<tr>
<td>Brine discharges</td>
<td>Desalination</td>
</tr>
<tr>
<td>Firstwater discharges</td>
<td>Coastal waste water treatment plants and untreated urban discharges</td>
</tr>
<tr>
<td>River regulation</td>
<td>Water supply, energy production and agriculture</td>
</tr>
<tr>
<td>Contamination by hazardous substances</td>
<td></td>
</tr>
<tr>
<td>Introduction of synthetic and non-synthetic compounds</td>
<td></td>
</tr>
<tr>
<td>Accidental spills</td>
<td>Industry; shipping</td>
</tr>
<tr>
<td>Diffuse pollution from atmospheric deposition</td>
<td>Industry; transport</td>
</tr>
<tr>
<td>Diffuse pollution from runoff</td>
<td>Agriculture, mining + industry</td>
</tr>
<tr>
<td>Riverine discharges</td>
<td>Industry; agriculture; sanitation</td>
</tr>
<tr>
<td>Intentional discharges</td>
<td>Industry; sanitation</td>
</tr>
<tr>
<td>Disposal of dredged material</td>
<td>Port activity</td>
</tr>
<tr>
<td>Introduction of radio-nuclides</td>
<td></td>
</tr>
<tr>
<td>Direct discharges</td>
<td>Nuclear power plants</td>
</tr>
<tr>
<td>Freshwater discharges</td>
<td>Nuclear power plants</td>
</tr>
<tr>
<td>Nutrient and organic matter enrichment</td>
<td></td>
</tr>
<tr>
<td>Inputs of fertilizers and other nitrogen- and phosphorus-rich substances</td>
<td></td>
</tr>
<tr>
<td>Riverine discharges</td>
<td>Industry; agriculture; sanitation</td>
</tr>
<tr>
<td>Farming of fish, shellfish and seaweed</td>
<td>Aquaculture</td>
</tr>
<tr>
<td>Farming of fish, shellfish and seaweed</td>
<td>Aquaculture</td>
</tr>
<tr>
<td>Diffuse pollution from atmospheric deposition</td>
<td>Industry; transport</td>
</tr>
<tr>
<td>Diffuse pollution from runoff</td>
<td>Agriculture and industry</td>
</tr>
<tr>
<td>Beach nourishment and construction of artificial beaches</td>
<td>Tourism and coastal defence</td>
</tr>
<tr>
<td>Biological disturbance</td>
<td></td>
</tr>
<tr>
<td>Introduction of microbial pathogens</td>
<td></td>
</tr>
<tr>
<td>Urban waste water discharges</td>
<td>Sanitation</td>
</tr>
<tr>
<td>Ballast waters</td>
<td>Shipping</td>
</tr>
<tr>
<td>Bathing sites</td>
<td>Tourism and recreation</td>
</tr>
<tr>
<td>Riverine discharges</td>
<td>Sanitation</td>
</tr>
<tr>
<td>Farming of fish, shellfish and seaweed</td>
<td>Aquaculture</td>
</tr>
<tr>
<td>Introduction of non-indigenous species and translocations</td>
<td></td>
</tr>
<tr>
<td>Huts and anchors</td>
<td>Shipping, anchoring</td>
</tr>
<tr>
<td>Ballast waters</td>
<td>Shipping</td>
</tr>
<tr>
<td>Farming of fish, shellfish and seaweed</td>
<td>Aquaculture</td>
</tr>
<tr>
<td>Offshore platforms and single buoy mooring</td>
<td>Industry</td>
</tr>
<tr>
<td>Disposal of dredged material</td>
<td>Port activity</td>
</tr>
<tr>
<td>Escapes from aquacultures</td>
<td>Recreation and research</td>
</tr>
<tr>
<td>Selective extraction of species</td>
<td></td>
</tr>
<tr>
<td>Extraction of species with a commercial interest</td>
<td>Commercial fishing</td>
</tr>
<tr>
<td>Farming of fish, shellfish and seaweed</td>
<td>Aquaculture</td>
</tr>
<tr>
<td>Harvesting of shellfish</td>
<td>Harvesting of shellfish</td>
</tr>
<tr>
<td>Recreational extraction of species</td>
<td>Recreation</td>
</tr>
<tr>
<td>Incident non-target catches</td>
<td>Commercial fishing</td>
</tr>
</tbody>
</table>


The COMMON SENSE project has received funding from the European Union’s Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.
After compiling the available information of land-based and ocean-based human activities that have an impact on the Spanish waters as well as their spatial distribution, these pressures and impacts were estimated and mapped by means of GIS tools. Taking into account the different relevance of the different pressures, numerical indexes were established in order to develop a cumulative analysis. Those areas with more accumulation/concentration of pressure were coastal areas with big cities.

The methodology used for pressures and impact analysis has followed the following steps:

1. Identification of the different pressures that cause the impacts established by the MSFD normative.
2. Identification of the origin of each pressure: human activities that cause that pressure.
4. Definition of the best indicator to characterize the pressure according to the impact analysed.
5. Search of information sources related to the pressure. If necessary, reformulation of the indicator.
6. Data quality control.
7. Data analysis. Indicator characterization:
   i. Time series (when possible 2005-2009).
   ii. Spatial: locate the pressure.

The cumulative analysis it has developed according to the methodology included in the article "Towards a Baltic Sea Pressure Index. A background document about method, data preparation and use of the index" (HELCOM 2010). “Cumulative effects assessment is a systematic procedure for identifying and evaluating the significance of effects from multiple activities. The analysis of the causes, pathways and consequences of these impacts is an essential part of the process.”

7.5.3 Socio-economic analysis

7.5.3.1 Methodology

The requirements for the social and economic analyses for the initial assessment are included in Article 8.1(c) of the MSFD. Article 8.1 (a) and (b) complete the holistic picture requiring an analysis addressing the status of the marine region and an analysis identifying the pressures and the effects they have on the state of the marine environment.
The methodology used was suggested by the European Working Group on Economic and Social Assessment (WG-ESA) development and it is called the DPSIR (Drivers, Pressures, State, Impacts and Responses), see the figure below.

Figure 25. DPSIR methodology

This methodological framework starts with the description of the determinant factors that cause the environmental pressures. This pressures cause changes on the environmental status and these changes could have impacts on human welfare. If these are undesired changes, the competent authority should respond by implementing measures that reduce these pressures. The determinant factors are those activities and social factors that use, directly or indirectly, marine environment and they consequently impact it. Pressures degrade the environmental status impacting on the human health and marine goods and services value. Society can act by means of determinant forces, pressures, impact status or impacts by means of implementing measures and incentives (i.e. policy instruments).

The information included in the economic analysis was provided by different associations and key entities belonging to key economic sectors.

The social and economic analysis is based on the Dutch experience implemented for the Water Framework Directive, called NAMWA (Brouwer et al. (2005), Van der Veeren et al. (2004) and the section 5.5.2 of the “Economic and social analysis for the Initial assessment for the marine strategy

266 http://sia.eionet.europa.eu/Indicators
267 Interview to Ms. Ainhoa Pérez Puyol and Ms. Sagrario Arrieta Algarra (Directorate General for the Sustainability of the Coast and the Sea - Ministry of Agriculture, Food and Environment) carried out within the framework of WP1.1. of the COMMON SENSE Project. July 2014.

The COMMON SENSE project has received funding from the European Union’s Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.
framework directive: a guidance document”\textsuperscript{270} of the Working Group on Economic and Social Assessment

The steps to be followed are the following:

1. Identify and describe the regions of interest.
2. Identify and describe the economic sectors that use the marine environment.
3. Identify and, if possible, quantify the economic profit of the marine sectors arising of the marine environment.
4. Identify and, if possible, quantify the impacts generated by these sectors.

7.5.3.2 Identification and general description of the marine sub-divisions

As it has been already mentioned, Spain has been divided into five marine divisions: North Atlantic, South Atlantic, Estrecho and Alborán, Levantino-Balear and Canary.

North Atlantic division

The North Atlantic region includes four Autonomous Communities (Galicia, Asturias, Cantabria and the Basque Country) and 7 provinces (La Coruna, Pontevedra, Lugo, Asturias, Cantabria, Gipuzkoa and Biscay).

The total population of this division was of 6.000.012 inhabitants in 2010. According to the economically active population survey of the last trimester of 2009, 2.464.000 people were employed. The services sector has the highest employment rate (68% out of the total), see the figure below.

\begin{figure}
\centering
\includegraphics[width=\textwidth]{north-atlantic-employment.png}
\caption{North Atlantic division employment distribution by sectors}\textsuperscript{271}
\end{figure}


Levantino-Balear division

The Levantino-Balear division covers 5 Autonomous Communities (Catalonia, Valencia, Balearic Islands, Murcia and Andalusia) and 9 provinces (Barcelona, Girona, Tarragona, Alicante, Castellón, Valencia, Balearic Islands Murcia and Almeria).

The total population of this division in 2010 was of 14.830.148 inhabitants. According to the economically active population survey of the last trimester of 2009, 5.940.000 people were employed within Levantino-Balear division. The services sector has the highest employment rate (70% out of the total), see the figure below.

Figure 27. Levantino-Balear division employment distribution by sectors

Alborán division

The Alborán division covers 4 provinces of Andalusia Autonomous Community (Almeria, Granada, Malaga, Cadiz, Ceuta and Melilla).

The total population of this division in 2010 was of 3.573.983 inhabitants. According to the economically active population survey of the last trimester of 2009, 1.190.400 people were employed within this division. The services sector has the highest employment rate (76% out of the total), see the figure below.

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Figure 28. Alborán division employment distribution by sectors

South Atlantic

The South Atlantic division includes 2 provinces of Andalusia Autonomous Community (Cadiz and Huelva).

The total population of this marine division in 2010 was of 1,480,838 inhabitants. According to the economically active population survey of the last trimester of 2009, 581,000 people were employed within this division. The services sector has the highest employment rate (74% out of the total), see the figure below.

Figure 29. South Atlantic division employment distribution by sectors

Canary

The Canary division covers 2 provinces of the Canary Autonomous Community: Las Palmas y Santa Cruz de Tenerife.

The total population of this division in 2010 was of 2,118,519 inhabitants. According to the economically active population survey of the last trimester of 2009, 798,000 people were employed within Canary division. The services sector has the highest employment rate (83% out of the total), see the figure below.

Figure 30. Canary division employment distribution by sectors

7.5.3.3 Economic sectors using marine environment

The following sectors have been assessed in order to have a complete overview of the current situation: (1) Fisheries (maritime fisheries, aquaculture, processing industry); (2) Ports infrastructure; (3) Recreational craft; (4) Shipping; (5) Tourism; (6) Shipbuilding industry; (7) Gas and petroleum; (8) Water treatment (wastewater, bathing waters and water desalinization); (9) Defence and (10) Renewable energies.

Fisheries

Spain is a maritime country. Fisheries have been a traditional activity and thus Spain has one of the most important fleets of the world contributing to the global economy. The fisheries sector in Spain gathers a set of related activities based on marine living resources: extractive fisheries, aquaculture, commercialization and products processing.

The information for fisheries sector analysis was obtained by means of the statistics of the Ministry of Agriculture, Food and Environment. As indicators for this activity, the fishing fleet and the catches captured by the Spanish fleet have been selected. Concerning fishing fleet, the variables used for the assessment were the number, volume, power and size of vessels. The number of vessels of the

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Spanish fleet was of 11.116 in December 2009 (2,4% less than a year before). 10.625 vessels out of the total operated at national fishing areas.

The table below shows the number of vessels by different gear typology and fishery area.

**Table 23. Number of vessels by gear typology and fishing area in Spain (December 2009)**

<table>
<thead>
<tr>
<th>By big areas</th>
<th>By modality census</th>
<th>Gear typology</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vessels number</td>
<td>Vessels number</td>
<td></td>
</tr>
<tr>
<td>National</td>
<td>Trawling</td>
<td>Seine</td>
<td>Longline</td>
</tr>
<tr>
<td>fishery area</td>
<td>117,00</td>
<td>306,00</td>
<td>86,00</td>
</tr>
<tr>
<td>Mediterranean Sea</td>
<td>797,00</td>
<td>274,00</td>
<td>165,00</td>
</tr>
<tr>
<td>Gulf of Cadiz</td>
<td>159,00</td>
<td>97,00</td>
<td>546,00</td>
</tr>
<tr>
<td>Canary</td>
<td>34,00</td>
<td>901,00</td>
<td>915,00</td>
</tr>
<tr>
<td>Any area</td>
<td>103,00</td>
<td></td>
<td>103,00</td>
</tr>
<tr>
<td>Total</td>
<td>1.073,00</td>
<td>689,00</td>
<td>354,00</td>
</tr>
<tr>
<td>EU fishery areas</td>
<td>Atlantic, non-Spanish</td>
<td>122,00</td>
<td>22,00</td>
</tr>
<tr>
<td></td>
<td>34,00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>International</td>
<td>International waters and third countries</td>
<td>102,00</td>
<td>5,00</td>
</tr>
<tr>
<td>fishery area</td>
<td>International waters</td>
<td>33,00</td>
<td>103,00</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>136,00</td>
<td>35,00</td>
</tr>
<tr>
<td>No fishery area assigned</td>
<td>No modality assigned</td>
<td></td>
<td>5,00</td>
</tr>
<tr>
<td>Total</td>
<td>1.331,00</td>
<td>722,00</td>
<td>484,00</td>
</tr>
</tbody>
</table>

Between 1998 and 2009 the Spanish fleet decreased 35,8% the number of vessels, 22,8% of the fleet volume (GT) and 26,2% the power (kW). Galicia is the Autonomous Community that presents a bigger fleet.

In 2008 fisheries catches, caught in any fishery area, weighted 886.916 T and had an economic value of 1.868 million Euros (in their first sale). It is important to highlight the North Oriental Atlantic by its large amount of catches from 2006-2008.

The income of maritime fisheries in 2009 reached 1.848 million Euros and an Added Value of 866 million Euros. These incomes were mainly (58,52%) generated in National waters (see the table below).
Table 24. Structure of fishing macro magnitudes of fishing production in Spain (Economic maritime survey 2009)

<table>
<thead>
<tr>
<th></th>
<th>National waters</th>
<th>Non-National waters</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Value</td>
<td>Structure</td>
<td>Value</td>
</tr>
<tr>
<td>A. FISHERIES PRODUCTION</td>
<td>912.54</td>
<td>100%</td>
<td>935.57</td>
</tr>
<tr>
<td>B. INTERMEDIATE CONSUMPTIONS</td>
<td>378.51</td>
<td>41.48%</td>
<td>603</td>
</tr>
<tr>
<td>C= (A-B), GROS ADDED VALUE</td>
<td>534.03</td>
<td>58.52%</td>
<td>332.57</td>
</tr>
<tr>
<td>D. FIX CAPITAL CONSUMPTION</td>
<td>86.84</td>
<td>9.52%</td>
<td>115.06</td>
</tr>
<tr>
<td>E. AFTER TAX ADDED VALUE</td>
<td>447.19</td>
<td>49%</td>
<td>217.51</td>
</tr>
<tr>
<td>F. OTHER SUVENTIONS TO THE PRODUCTION</td>
<td>33.39</td>
<td>3.66%</td>
<td>27.75</td>
</tr>
<tr>
<td>G. OTHER PRODUCTION TAXES</td>
<td>1.31</td>
<td>0.14%</td>
<td>0.98</td>
</tr>
</tbody>
</table>

The maritime fisheries sector employed in 2009 more than 6,000 employees, 97.6% onboard, and 65.6% in National waters. Fisheries sector account for 0.19% out of the total employment and it has a productivity of 23.606€.

Aquaculture

Until the 80s, the aquaculture in Spain was concentrated in a few species (mussels, trout, and distributed among some small and traditional companies. The aquiculture industry set around Cadiz was over at late 40s when salt industry entered in the region.

The development of new technologies and the industrialization process of the sector fostered the inclusion of new species, such us the turbot (in the North of Spain), the gilthead seabream and the seabass (in the South of Spain). Moreover mussel and trout farming improved their industrialization methods.

Aquaculture in Spain produced, in 2008, 230.007 T of the following living resources: 44.697T of fish; 185.184 T of molluscs, 113T of crustaceans and 14T of aquatic plants.

Molluscs, mainly mussel (72.69%), are the most farmed species in Spain. Fish production, arising from both marine and continental production, accounts for 24.59% out of the total production specially gilthead seabream, seabass, turbot, tuna, and trout. Although this is a low percentage, marine fish production has importantly increased doubling the production during the recent years.

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The COMMON SENSE project has received funding from the European Union's Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.
The gross added value generated by aquaculture in Spain was around 134 million Euros in 2009. Marine aquaculture was employing in 2010 more than 27,072 employees, accounting for 5,675 Annual Work Units (AWU). 50% of this workforce is self-employed.

### Shellfish harvesting

Shellfish collection is an extractive fishing modality addressed to invertebrate catches and it has a great repercussion in the North and South Atlantic regions of Spain.

It gathers two modalities: “on-foot” and “afloat”. On-foot shellfish harvesting takes place in the maritime-terrestrial zone and in the marine area (accessible without a boat/vessel) and afloat shellfish harvesting is determined by the use of an auxiliary boat/vessel. On-foot modality is mainly performed by women and afloat modality mainly by men.

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According to the Marina Social Institute (2006), Galicia had 4,789 members dedicated to the shellfish harvesting activity out of the total members in Spain (around 5,450). Galicia is followed in terms of members by Andalusia, Cantabria, Asturias and Catalonia.

**Fishing and aquaculture products processing industry**

The food processing industry constitutes the most important productive step within the Spanish fisheries sector. It currently produces around 900,000 T/year of finished product. In 2008 this industry obtained an economic value higher than 4,100 million of Euros. This industry is complex and it includes:

1. Fish, crustacean and molluscs processing and preservation industry.
2. Fishmeal industry (flour/powder and fish oils)
3. Cookers and fish by-products utilization.

In 2008, there were 572 companies within the fish processing and elaboration industry from which, 336, have less than 20 employees and 236 with 20 or more employees.

*Table 26. Fish processing industry structure in Spain, 2010*

<table>
<thead>
<tr>
<th>Years</th>
<th>&lt;20 employees</th>
<th>&gt; or = 20 employees</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>368</td>
<td>249</td>
<td>617</td>
</tr>
<tr>
<td>2006</td>
<td>340</td>
<td>252</td>
<td>592</td>
</tr>
<tr>
<td>2007</td>
<td>358</td>
<td>262</td>
<td>620</td>
</tr>
<tr>
<td>2008</td>
<td>336</td>
<td>236</td>
<td>572</td>
</tr>
</tbody>
</table>

In 2008, the industry of fish processing industry was employing 19,737 people. Most of the employees are found in the autonomous community of Galicia followed Cantabria and the Basque Country.

**Ports infrastructure**

The Law 27/1992, of November 24th, of the Ports of the State and of the Merchant Marine, modified by the Law 62/1997, of December 26th, distinguish according to the management authority, between those ports managed at Autonomous Community level (mainly fishing, nautical ports and places of refuge) and those ports managed at National level (qualified as port of general interest). The ports of general interest present at least one of the following characteristics: (1) they carry out maritime international commercial activities, (2) they serve industries of strategic importance at a national level, (3) their annual volume and the characteristics of their maritime commercial activities.

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The COMMON SENSE project has received funding from the European Union's Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.
reach relevant enough levels or they cover essential needs of the State economic activity, (4) their special technical or geographical characteristics are essential for maritime traffic safety.

Ports related information comes from the annual memories of yearbooks and reports of the ports of the State, fleet census and the National Nautical Businesses Association. The number of Ports was chosen by Spain as the economic indicator to assess ports’ activity and infrastructure. Ports’ national system gathers 46 ports of general interest managed by 28 ports authorities whose coordination and efficiency control correspond to the State Port Authority that depends on the Ministry of Public Works.

The following table shows the number of ports by each Spanish autonomous community in 2006.

**Table 27. Fishing ports by Spanish Autonomous Community**

<table>
<thead>
<tr>
<th>Autonomous Community</th>
<th>Fishing ports</th>
</tr>
</thead>
<tbody>
<tr>
<td>Andalusia</td>
<td>38</td>
</tr>
<tr>
<td>Asturias</td>
<td>25</td>
</tr>
<tr>
<td>Balearic Islands</td>
<td>17</td>
</tr>
<tr>
<td>Canary</td>
<td>56</td>
</tr>
<tr>
<td>Cantabria</td>
<td>9</td>
</tr>
<tr>
<td>Catalonia</td>
<td>39</td>
</tr>
<tr>
<td>Ceuta</td>
<td>1</td>
</tr>
<tr>
<td>Valencia</td>
<td>28</td>
</tr>
<tr>
<td>Galicia</td>
<td>78</td>
</tr>
<tr>
<td>Melilla</td>
<td>1</td>
</tr>
<tr>
<td>Murcia</td>
<td>4</td>
</tr>
<tr>
<td>Basque Country</td>
<td>24</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>320</strong></td>
</tr>
</tbody>
</table>

According to the National Nautical Businesses Association, recreational craft fleet had 355 nautical ports and 126,963 moorings in 2009. The autonomous communities with a higher number of nautical ports are the Balearic Islands, Galicia, Catalonia and Andalusia.

National ports are passed by around 60% of exports and 85% of imports, representing 53% of foreign trade with the European Union and 96% with other countries.

The national ports system accounts for 20% of the GDP in the transport, which represents 1,1% of the Spanish GDP. Ports sector generates 35,000 direct jobs and around 110,000 indirect jobs.
Shipping

The information concerning shipping figures in Spain has been obtained by means of the following sources: yearbooks of the Ports of the State, he report on “transport, infrastructure and postal services”284 of the Ministry of Public Works and the Services Annual Survey285 of the National Statistics Institute of Spain.

In 2009, the traffic volume in the ports of general interest of Spain (managed by Ports of the State) was of 413.04 million Tones. Containers traffic exceeded, in 2009, 11.7 million TEUs286. The number of vessels that entered into the Ports of the State was of 115.628, with a gross register tonnage (GT) of more than 1.622 million T.

25,2 million passengers passed through the Spanish ports in 2009, being the Balearic Port Authority the one with more passengers traffic (5 million passengers).

Concerning the structure of the fleet under the Spanish flag, the number of merchant vessels registered in the Vessels and Shipping Companies Book at the end of 2009 was o 1.244 with 2.798.800 GT. The remaining vessels are classified as special or of port’s traffic, roadstead orbay.

Concerning the vessels under foreign flags but belonging to Spanish shipping companies, controlled more than 1.600.000GT in 2009. In this sense, the fleet under Spanish shipping companies in 2009 was of 4.000.000 GT.

Regarding vessels age, 60% of the total tonnage of the merchant fleet under Spanish flag was from 5 to 9 years old, followed by vessels under 5 years old (December 2009).

The Spanish maritime transport sector reached a turnover of more than 1.850 million Euros with a gross added value close to 500 million Euros.

The 254 companies of the sector employed in 2009 an annual average of 7.810 employees.

The following table shows the economic indicators for the shipping sector in Spain.

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286 TEUs - Twenty-foot Equivalent Unit.
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Table 28. Economic indicators of the Maritime Transport Sector in Spain

<table>
<thead>
<tr>
<th>Economic figures (thousand Euros)</th>
<th>Passengers maritime transport and by inland navigable waterways</th>
<th>Goods maritime transport and by inland navigable waterways</th>
<th>TOTAL Maritime transport</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of companies</td>
<td>254</td>
<td>80</td>
<td>334</td>
</tr>
<tr>
<td>Turnover</td>
<td>917.260</td>
<td>935.270</td>
<td>1.852.530</td>
</tr>
<tr>
<td>Production value</td>
<td>859.043</td>
<td>809.799</td>
<td>1.668.842</td>
</tr>
<tr>
<td>Market added value</td>
<td>257.359</td>
<td>238.775</td>
<td>496.134</td>
</tr>
<tr>
<td>Factors cost added value</td>
<td>271.086</td>
<td>243.273</td>
<td>514.359</td>
</tr>
<tr>
<td>Human resources costs</td>
<td>163.141</td>
<td>120.725</td>
<td>283.866</td>
</tr>
<tr>
<td>Purchase and costs of goods and services</td>
<td>713.648</td>
<td>722.151</td>
<td>1.435.799</td>
</tr>
<tr>
<td>Purchase of goods and services for resale</td>
<td>114.681</td>
<td>150.469</td>
<td>265.150</td>
</tr>
<tr>
<td>Investment in tangible assets</td>
<td>64.183</td>
<td>27.423</td>
<td>91.606</td>
</tr>
<tr>
<td>Persons employed (annual average)</td>
<td>4.922</td>
<td>2.888</td>
<td>7.810</td>
</tr>
<tr>
<td>Salaried employees (annual average)</td>
<td>4.808</td>
<td>2.870</td>
<td>7.678</td>
</tr>
</tbody>
</table>

Nautical sector

The natural characteristics of Spain are optimal to practice nautical activities both for the extensive coastline and the good weather conditions that can be enjoyed during most part of the year. The nautical sector gathers many different sailing related activities such as boatbuilding, recreational craft sales, nautical ports, boat renting, repair & refit business, accessory commercialization, etc. These activities are very important for the economy of certain regions.

The information of this section has been obtained by means of the following reports of the National Nautical Businesses Association: (1) the Nautical Sector in Spain. Recreational and sportive nautical (2010); (2) Nautical sector economic impact assessment (2007).

The number of licenses has been chosen as indicator of nautical activities practice (shown in the table below).

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288 Asociacion Nacional de Empresas Nauticas (ANEN) - http://www.anen.es/
The COMMON SENSE project has received funding from the European Union’s Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.
Tourism in Spain has been decreasing since the year 2000 that it impacts on GDP contribution, being 11.5% at the beginning of this decade and decreasing until 10.5% in 2008.

11% of people employed in Spain are employed in the tourism sector. For certain economies, such as the insular economies, tourism sector reaches 25% out of the total employment.

According to data obtained by means of the Economically Active Population Survey, in 2009, the number of people economically active increased until 2,496,561 people, 0.2% more than the previous year. This supposed 10.8% of the assets of the economy and 16.8% of the assets of the services sector (14.8 millions).

**Shipbuilding industry**

Boatbuilding industry is composed by boat builders that build hull structures and integrate boat components provided by auxiliary industry getting this way the complete vessel.

An important characteristic for boatbuilding industry is the uniqueness of its projects: every product is unique and different from others. This characteristic impedes mass production (except fishing or army vessels). Another characteristic is the high economic value of vessels that it normally exceeds companies’ financial capacity.

Global economy and high technology directly impact on this industry. Spanish shipbuilding is well known around the world highlighting ship design and construction of different multifunctional vessels and artefacts for the petroleum extractive industry.

The information included in this section was obtained by means of the following sources: (1) presentation of shipbuilding sector (Ministry of Industry, Tourism and Commerce); (2) Bulletin of

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information on the shipbuilding sector (Naval Sector Management Organization – Gerencia del Sector Naval - and Ministry of Industry Tourism and Commerce). There exist 24 shipbuilding companies and 11 of repair&refit companies (see the figure below).

![Map of main shipbuilding companies in Spain](image)

**Figure 32. The main shipbuilding companies in Spain**

Shipbuilding industry workload varies between Autonomous Communities being the Galicia and Asturias the regions with higher workload (data provided by the Bulletin of Shipbuilding of the Gerencia del Sector Naval of the Ministry of Industry, Tourism and Commerce - January 2012).

According to the Ministry of Industry, Tourism and Commerce the VAB for the Shipbuilding sector in 2009 was of 853 million Euros and the number of employees was close to 13.000 (see the table below).
Gas and petroleum

Exploitation of petroleum, natural gas and mineral resources arising from generation and accumulation of natural hydrocarbons, it requires the location and possible hydrocarbon deposits. In order to identify deposits, different and complex technologies and studies are required.

The information included in this section has been obtained by means of the Bulletin of Strategic Reserves of Petroleum Products (CORES).

In Spain, petroleum and gas deposits have been discovered in Ayoluengo (Burgos), Mediterranean Sea, Gulf of Valencia, Cantabria Sea, the Guadalquivir valley and the Gulf of Cadiz.

In 2009, domestic crude oil production was 107.000 T and 158GWH of Natural Gas (CORES annual summary, 2009). In 2010, crude production increased 14% and it produced 122 kt of oil equivalent.

The active wells (”Boquerón”, “Casablanca” and “Rodaballo”) are set in the petrol platform of Casablanca in front of the Tarragona coast. On the other hand, inland natural gas production reached, in 2010, 664GWh.

The internal hydrocarbons production in Spain represents 0,18% of Spanish crude and 0,16% of natural gas.

The mining sector in Spain employed around 32.000 people in 2009 (25.000 jobs on mineral extraction, 6000 jobs on energetic minerals and 1.000 jobs on metallic minerals).

Concerning the production value, in 2009, the value of the saleable production value was of 3.550M€ (14% less than the previous year).

The turnover of the mining sector in 2007 was of 49.000 million Euros and directly employed 287.000 people.

Water treatment (wastewater, bathing waters and water desalinization)

The information on water treatment was obtained by means of the following sources: (1) Water supply and sanitation, INE 2009; (2) Water Satellite Account, INE 2006; (3) Environment Profile of Spain, 2009; (4) Status of bathing waters in Europe, European Environment Agency; (5) Green Jobs in a sustainable economy report, Biodiversity Foundation (FundaciónBiodiversidad).

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294 Gerencia del Sector Naval – www.gernaval.org

The COMMON SENSE project has received funding from the European Union's Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.
Waste water treatment has positively evolved during the last decades thanks to the National Plan for Waste Water Cleansing and Purification (1995-2005) and due to the enforcement of industry water quality regulation framework. This plan was recently replaced by the National Plan for Water Quality: Cleansing and treatment (2007-2015) that set ambitious objectives in order to meet the Water Framework Directive requirements.

These measures aim at meeting the Directive 91/271/CEE and at contributing to meet the Good Environmental Status required by the Water Framework Directive requires by 2015.

In 2009, more than 12 million of cubic meters of water were treated every day, highlighting Andalusia and Catalonia regions that reached the maximum treated volumes.

Due to the limited water resources in Spain brackish water desalinization is one of the options to obtain this resource. Spain has increased its desalinization capacity during the last years. In 2010 desalinization incremented 7,8% regarding 2009, reaching 2959 m²/day. Canary is the region with a higher desalinization capacity followed by Andalusia, Catalonia and Murcia.

94,1% of Spanish bathing waters reached the obligatory water quality in 2010. The number of water bodies not complying with the Escherichia Coli increased by 0,1% and 6 water bodies were closed from bathing activities in 2010.


The COMMON SENSE project has received funding from the European Union’s Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.
Figure 34. Results of bathing water quality in Spain from 1990 to 2010. Note: for the year 2010 results are applying the less strict rules are presented\textsuperscript{296}

Water management and treatment sector employs more than 58,000 people in Spain, from which 42,000 work in coastal Autonomous Communities\textsuperscript{297}. The gross value of water management and treatment sector in Spain reached 844 million Euros in 2006.

**Defence**

The information included in this section was obtained by means of the report of Corporate Responsibility Report of the Ministry of Defence, 2010.

The Spanish Navy contributes to the security and welfare of citizens and focus on those who develop professional activities in the sea. The Navy participate in the operations of the Spanish Armed Forces contributing to the Spain defence and its general interests. Due to the increasing risks and threats, the Navy develops monitoring and security activities within territorial waters.

In 2009, the navy had 22,000 members and its budget exceeded 1000 million Euros.

**Renewable energies**

**Wind energy**

The information included in this section was obtained by means of the Environmental Strategic Study of the Spanish Littoral (Ministry of Industry, Energy and Tourism) and the Renewable Energy Plan, 2011-2020 (Ministry of Industry, Energy and Tourism).

\textsuperscript{296} European Environmental Agency.

\textsuperscript{297} Fundación Biodiversidad. Green employment in a sustainable economy, 2010.
The Renewable Energies Plan 2005-2010 includes within its objectives to reach a power of 20.155 MW in 2010. The same plan foresees the implementation of demonstration offshore wind parks and the possibility to install 1.000 MW in the territorial sea.

The Royal Decree 1028/2007 of July 20th established the administrative procedure for the applications to obtain the authorization for marine electricity generation installations.

In 2010, it was published the Study of the Spanish Littoral for the Installation of offshore windmill parks that identifies the coastal areas in Spain that gather the optimal favourable environmental conditions for the implementation of windmill parks (within the first 24 nautical miles from the baseline and including internal waters). The study areas were defined. These areas were classified as “suitable”, “non-suitable with the environmental conditions” and exclusion areas. This study assesses 4.000Km of coast and establishes more than 70 suitable areas where wind park installation could be assessed.

**Wave and tidal energy**

The cost for the installation of wave and tidal energy is currently high and they are not reliable because they are not mature technologies.

There are many ongoing projects for the development of these technologies and to increase their reliability.

No commercial plants are expected at short/mid-term due to the existing problems encountered among the different existing models and the real behaviour. However it is feasible the availability of small-scale energy production plants that could contribute to the energy network.

Spain has a high marine energy potential and due to the Spanish coast characteristics, wave energy profit that is the most feasible so far. The Cantabrian coast of the Canary Islands is the region that presents the best energy potential in Spain.

### 7.5.4 Future scenarios

#### 7.5.4.1 Characteristics of the marine sectors

**Population**

According to the “Spanish population projection at a short term 2011-2021”, published by the National Statistics Institute of Spain (October 2011), if the current tendencies continue the Spanish population will increase by 1,2% during the period from 2011 to 2021. The Spanish population would reach 45,6 million people by 2021.

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The progressive decreasing of the natural population growing (difference between births and deaths) and the migration levels are the main reasons that contributed to the decreasing of the population of 5 of the coastal autonomous communities in Spain (Galicia, Asturias, Basque Country and Catalonia). During the following decade, in Galicia, Asturias Basque country and Cantabria, the number of accumulated deaths would exceed the number of births resulting in a negative population growth. Population growth in the remaining coastal communities would remain discrete. The highest population growth levels are expected for the Balearic Islands, Canary Islands, Andalusia and Murcia.

On the other hand if emigration tendencies continue, Spanish population will decrease between 2011 and 2020, mainly in those regions where immigration rate was higher during the last decades. Population growing and increasing will lead to pressures and impacts increasing. Society awareness raising will be very important to reduce this impact as much as possible.

Employment

According to the National Statistics Institute\textsuperscript{299} (INE), demographic factors influence the labour market evolution, since they condition population structure and thus the economically active population. The INE observes a progressive aging population from 2011 to 2016. This will result in a decrease of the overall rates of activity, given the lowest rate of activity and older economically active population.

The overall activity rate of the Spanish population aged 16 or older would increase from 60.2\% in 2011 to 57.0\% in 2026.

Fisheries

The CFP aims at increasing the sustainability of marine ecosystems, fisheries activities and fish species population. By this way the EC aims at provide, at a long term, European citizens with stable, healthy and safety fish supply. Finish with dependence on public subventions/funding is one of the other objectives of the CFP together with promoting and increasing jobs and growth opportunities in coastal communities.

The CFP has 4 main policy areas:

1. Fisheries management\textsuperscript{300}
   - To ensure high long-term fishing yields for all stocks by 2015 where possible, and at the latest by 2020. This is referred to as maximum sustainable yield.
   - To reduce unwanted catches and wasteful practices to the minimum or avoid them altogether, through the gradual introduction of a landing obligation.

Fisheries management will be implemented by input control (e.g. rules on access to waters, control of the fishing effort and technical measures) and output contrils (TACs and quotas).

\textsuperscript{300} http://ec.europa.eu/fisheries/cfp/fishing_rules/index_en.htm
2. International policy\textsuperscript{301}: the EU promotes better governance by means of international organisations, developing and implementing policy on fisheries management and the Law of the Sea.

3. Market and trade policy focuses on\textsuperscript{302}:
   - Organisation of the sector
   - Marketing of fishery and aquaculture products

4. Funding of the policy covers five priority areas:
   - adjustment of the fleet (e.g. to support scrapping of fishing vessels)
   - aquaculture, processing and marketing, and inland fishing (e.g. to support the shift to more environmentally friendly production methods)
   - measures of common interest (e.g. to improve product traceability or labelling)
   - sustainable development of fisheries areas (e.g. to support diversification of the local economy)
   - technical assistance to finance the administration of the fund.

With these measures it is expected that sustainable fish populations were reached by 2015 triggering GES achievement. On the other hand, the implementation of these measures will reduce pressures and impacts on ecosystems and species promoting their protection and recovery. It is expected that CFP measures will indirectly reduce eutrophication problems and enhance agreements and strategies integration. Market and trade policies and systems have evolved focusing more on sustainability

Concerning CFP funding, particular attention is given to fishing communities most affected by recent changes in the industry.

Aquaculture

In 2009, the EC published a communication in order to promote the sustainable aquaculture. “The new strategy has the following three main principles”

- Help the sector become more competitive through strong support for research and development, better spatial planning in coastal areas and river basins, and giving specific help through the EU’s fisheries market policy.

- Ensure it remains sustainable by maintaining its environmentally-friendly production methods and high standards of animal health and welfare and consumer protection.

- Improve governance and ensure there is a business-friendly environment in place at all levels – local, national and EU – so the sector can realise its full potential.” \textsuperscript{303}

Aquaculture is also included within the CFP objectives and the following four priority areas have been identified in consultation with all relevant stakeholders: (1) reducing administrative burdens; (2)
improving access to space and water; (3) increasing competitiveness and (4) exploiting competitive advantages due to high quality, health and environmental standards.

The improving of the access for this activity to space and water would lead to increase environmental impacts. Environmental innovative technologies should be applied. On the other hand these would constitute a good monitoring platform to assess GES.

**Port infrastructure and shipping**

The European Commission published, in 2009, the Commission Communication - Strategic goals and recommendations for the EU’s maritime transport policy until 2018\(^{304}\). The priority areas are the following: (1) European shipping in globalised markets; (2) Human resources, seamanship and maritime know-how; (3) Quality shipping; (4) Exploiting the potential of Short Sea Shipping; (5) Europe - a world leader in maritime research and innovation.

At a national level the *Ministry of Public Works and Transport* in Spain developed the “Strategic Infrastructures and Transport Plan”\(^{305}\) (2004) includes activities related to transport and infrastructure from 2005 to 2020.

The actions of the Strategic Infrastructures and Transport Plan are grouped within the following categories: (1) Transport safety; (2) The road transport system; (3) The rail system; (4) Sea transport and ports; (5) Air transport; (6) The intermodal goods system; (7) The intermodal passenger system; (8) Urban transport and (9) Innovation in transport.

The priorities of this plan focused on both the consolidation of ports as intermodal reference nodes that could give support the progressive deployment of an intermodal freight network and on achieving safer and environmentally friendly shipping services. The implementation of these actions would allow the progressive consolidation of intermodal transport services. Port authorities would be the reference agents for logistic intermodal installations not only in ports but in places inside the peninsula, actively participating in the administrative coordination processes to consolidate the integration of rail transport within the intermodal network.

The following table summarises the projection to 2020 in traffic trends and these infrastructure indicators, distributed according to marine frontages. The forecasts are also given for investment needs.

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\(^{305}\) Plan Estratégico de Infraestructuras y Transporte (PEIT)  
http://www.fomento.gob.es/MFOM/LANG_CASTELLANO/_ESPECIALES/PEIT/

The COMMON SENSE project has received funding from the European Union's Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.
Table 31. Forecasts for traffic and the development of the port system in Spain, 2005-2020\textsuperscript{106}

<table>
<thead>
<tr>
<th>Marine Frontages</th>
<th>Total Investment (Mn € 2004)</th>
<th>Traffic 2020 (Mt)</th>
<th>Traffic increase (Mt)</th>
<th>Increase Berth length (m)</th>
<th>Increase Land area (ha)</th>
<th>Increase Protected water area (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NORTH-NORWEST</td>
<td>5,821</td>
<td>155.6</td>
<td>54.6</td>
<td>18,627</td>
<td>657</td>
<td>810</td>
</tr>
<tr>
<td>SOUTH-EAST</td>
<td>12,888</td>
<td>444.0</td>
<td>191.0</td>
<td>34,626</td>
<td>1,259</td>
<td>1,962</td>
</tr>
<tr>
<td>NON-PENINSULAR</td>
<td>3,771</td>
<td>101.1</td>
<td>44.1</td>
<td>8,623</td>
<td>287</td>
<td>300</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>22,480</strong></td>
<td><strong>700.7</strong></td>
<td><strong>289.7</strong></td>
<td><strong>61,876</strong></td>
<td><strong>2,203</strong></td>
<td><strong>3,072</strong></td>
</tr>
<tr>
<td><strong>CURRENT SITUATION (2004)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% GROWTH</td>
<td></td>
<td>71%</td>
<td>31%</td>
<td>56%</td>
<td>17%</td>
<td></td>
</tr>
</tbody>
</table>

Port infrastructure and shipping innovations and sustainable policies will help to diminish air and water pollution, invasive species and noise contributing to reach GES. On the other hand shipping could constitute an effective platform for descriptors monitoring.

**Tourism**

According to the report on “Tourism perspective, business rating of 2011 and perspectives for 2012\textsuperscript{307}”, developed by Exceltur, Tourism significantly increased in 2011. In this sense, Tourism GDP increased 2,6% in real terms so tourism grew almost four times more than the whole Spanish economy.

Thanks to this growth, Tourism activities contributed with 2,678 million Euros more than in 2010 and a net creation of 17,000 jobs. Taking this into account, tourism is the sector that contributed more to the GDP in 2010 and the only sector that generated employment in 2010. Nevertheless, these values are still 5,6% under the figures achieved in 2007.

Exceltur places the tourism growth forecast to 0,2%. Concerning the non favourable macroeconomic conditions of source markets, it is expected that Spain could be perceived as a safer destination compared to the countries of the North of Africa, that they are still affected by the facts related to the Arab Spring.

The World Travel & Tourism Council developed forecasts for the Tourism sector in Spain by 2022 and it has obtained the following results:

1. It is expected that the direct contribution of the Travel&Tourism sector to the GDP will annually grow 1,0% until 62,5 billion Euros (5,1% of the GDP) by 2022 (see the figure below).

\textsuperscript{106} Plan Estratégico de Infraestructuras y Transporte (PEIT)
http://www.fomento.gob.es/MFOM/LANG_CASTELLANO/_ESPECIALES/PEIT/

\textsuperscript{307} Perspectivas turísticas, Valoracion empresarial del año 2011 y perspectivaspara 2012
http://www.exceltur.org/excel01/contenido/portal/files/presentacion_informe_perspectivas_num43.pdf
The total contribution of the travel and tourism sector (including indirect and induced effects) is expected to annually grow 0.7% resulting in 168.8 billion Euros (13.8% of the GDP).

Tourism growth forecast will lead to pressures and impacts increasing. Tourism awareness raising will be very important in order to reduce impacts and pressures as much as possible.

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World Travel & Tourism Council.

The COMMON SENSE project has received funding from the European Union’s Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.
Water treatment

The ancient Ministry of Environment approved the year 2007 the National Plan for Water Quality 2007-2015\textsuperscript{310}. The starting point of the Water Quality Action Plan was the need to accomplish the requirements established by the Water Framework Directive.

The Directive 91/271/CEE aims at reducing the surface water (arising from urban wastewater) pollution levels. This Directive is applicable to domestic waste waters, rainwater and industrial wastewaters. Those industries that discharge into municipal sewer networks must to obtain an authorization/permit. The Directive 91/271/CEE set several objectives for different size localities by 2015, depending on the number of inhabitants and the discharge systems these localities had. General objectives defined by the National Plan for Water Quality are: (1) to protect the biodiversity; (2) to manage marine and terrestrial water to ensure the quality and status of surface water, groundwater, transition waters and coastal waters; (3) to guarantee populations’ water supply; (4) to promote public/citizens’ participation and ensure a transparent water administration; (5) to foster concentration, cooperation and coordination between administration bodies in order to improve citizens services and (6) to protect water accessibility and quality for current and future generations.

The total investment allocated to the National Plan for Water Quality (2007-2015) was of 19.006,8 Euros.

Water treatment initiatives will definitely help to achieve the GES since they will reduce the contribution and discharge of pollutants and nutrients into the waterways and into the sea.

7.6 Legislation, measures and relevant agreements for the implementation of the MSFD

EU Policies

1. Integrated Maritime Policy
2. Common Fisheries Policy
3. Climate Change Strategy
4. Common Agriculture Policy
5. Environmental Strategy for the Mediterranean
6. Strategy to improve maritime governance in the Mediterranean
7. Strategic goals and recommendations for the EU’s maritime transport policy until 2018

EU Directives

1. Water Framework Directive
2. Urban Wastewater Directive
3. Shellfish Water Directive
4. Bathing Waters Directive

\textsuperscript{310} Plan Nacional de Calidad de las Aguas

The COMMON SENSE project has received funding from the European Union’s Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.
6. Habitats Directive
7. Birds Directive

Regional Conventions
1. Barcelona Convention
4. Hazardous and Noxious Substances Convention
5. London Convention
6. Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention)

National regulatory framework

Plans and programs
1. Plan Estratégico Nacional del Fondo Europeo de la Pesca.
2. Programa operativo para el sector pesquero español.
6. Plan Estratégico directrices gestión integrada de costas.
10. Estrategia Española de Conservación y Uso sostenible de la Biodiversidad biológica.

Legislation
1. Ley 41/2010 de Protección del Medio Marino.
2. Real Decreto 1628/2011, de 14 de noviembre, por el que se regula el listado y catalogo español de especies exóticas invasoras.

7.7 Economic assessment of marine environment deterioration

An economic assessment of marine environment deterioration was included as a part of the Initial Assessment.\footnote{http://www.magrama.gob.es/es/costas/temas/estrategias-marinases/0_Documento_marco_estrategias_marinas_tcm7-204388.pdf}

Costs-based approach aims at qualitatively and quantitatively estimating the different costs concerning to the current deterioration marine environment levels. This approach requires the following tasks:

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The COMMON SENSE project has received funding from the European Union's Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.
1. To identify the legislation addressing marine environment improvement.
2. To assess the mentioned legislation costs for public and private sectors.
3. To assess the part/proportion of the mentioned legislation that has an effect on the marine environment and thus that it is justified.
4. To sum up the marine environment protection expenses of all the legislations assessed.

This economic assessment estimates how much is every sector investing in relation to the total budget dedicated to this end. This approached is based on the principle that measures preventing environmental deterioration were approved because the value resulting from their implementation is higher than the cost of these measures. In this sense, the costs of the mentioned measures could be an estimation of environmental deterioration costs.

In this sense, national and regional budgetary programs (from 2009 to 2011) addressing marine environment protection measures have been assessed.

**General State Administration**

The following three Ministries and seven budgetary programs have been identified:

**Ministry of Agriculture, Food and Environment:**
1. Protection of fisheries resources and sustainable development (*Protección de los recursos pesqueros y desarrollo sostenible*).
   To ensure the accomplishment of fisheries policy objectives. Inspection, monitoring and control.
2. Infrastructures and fisheries markets improvement (*Mejora de estructuras y mercados pesqueros*).
3. Water Quality (*Calidad del agua*).
4. Coastal Action (*Actuacion en la costa*).
5. Climate Change and pollution prevention actions (*Actuaciones para la prevención de la contaminación y el cambio climático*).

**Ministry of Economy and Competitiveness:**
1. Fisheries and oceanographic research (*Investigacion oceanografica y pesquera*).

**Ministry of Public Works:**
1. Shipping safety and monitoring (*Seguridad del trafiocomaritimo y vigilancia costera*).

The mentioned programs were economically assessed. Results are shown in the following table and figure.
The COMMON SENSE project has received funding from the European Union’s Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.

Table 32. Budget of national programs related to marine environment in Spain

<table>
<thead>
<tr>
<th>PROGRAMS</th>
<th>CODES</th>
<th>BUDGET (Million Euros)</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protection of fisheries resources and sustainable development</td>
<td>415A</td>
<td>47,68</td>
<td>52,10</td>
<td>28,67</td>
<td></td>
</tr>
<tr>
<td>Infrastructures and fisheries markets improvement</td>
<td>415B</td>
<td>125,11</td>
<td>152,08</td>
<td>93,34</td>
<td></td>
</tr>
<tr>
<td>Water Quality</td>
<td>456A</td>
<td>471,83</td>
<td>584,98</td>
<td>295,34</td>
<td></td>
</tr>
<tr>
<td>Coastal Action</td>
<td>456D</td>
<td>280,83</td>
<td>301,20</td>
<td>162,40</td>
<td></td>
</tr>
<tr>
<td>Climate Change and pollution prevention actions</td>
<td>456M</td>
<td>121,19</td>
<td>166,57</td>
<td>101,51</td>
<td></td>
</tr>
<tr>
<td>Fisheries and oceanographic research</td>
<td>467E</td>
<td>65,77</td>
<td>61,28</td>
<td>60,52</td>
<td></td>
</tr>
<tr>
<td>Shipping safety and monitoring</td>
<td>454M</td>
<td>264,41</td>
<td>219,10</td>
<td>197,17</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td>1,376,82</td>
<td>1,537,31</td>
<td>938,95</td>
</tr>
</tbody>
</table>

Figure 37. Budget of national programs related to marine environment in Spain

7.8 Initial assessment, Good Environmental Status and environmental targets: introduction and methodology

Milieu Ltd Consortium has carried out a technical assessment of the MSFD 2012 obligations for Spain based on those reporting sheets uploaded on time. This document assessed reports delivered by the Ministry of Agriculture, Food and Environment concerning Articles 8, 9 and 10 of the DIRECTIVE 2008/56/EC.

As a result, within the limited time available for the assessment performed by Milieu Ltd Consortium and taking into account the sheer volume of the Spanish text-based paper report, it was not always possible to clearly identify all relevant and appropriate information from the text report.

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312 Framework document documents for the 5 marine strategies, one for each of the Spanish Marine Sub-division
313 Framework document documents for the 5 marine strategies, one for each of the Spanish Marine Sub-division
The consistency of the approach was assessed by Milieu Ltd Consortium as follows: “The approach to set GES and targets and to carry out the initial assessment is consistent across descriptors and subdivisions. However, some differences within GES definitions have been identified across sub-divisions and the reasons for these differences are not always clear (e.g. Spain includes the status of planktonic communities as an indicator of GES at ecosystem level for the North subdivision of North East Atlantic (NEA) but does not add such indicator for the other subdivisions without apparent reason).”

Details on monitoring methodology are included in “D1.1. Review on the available methodological standards and gaps to be covered in order to meet the MSFD requirement” of the COMMON SENSE Project.

7.8.1 Summary of the initial assessment

The Initial Assessment for the Spanish case study has been included in Annex VI. Nevertheless, in this section a brief summary is included gathering the main results obtained.

The table included in Annex VI summarizes the results of the Initial Assessment carried out by the Milieu Ltd Consortium for the 5 marine regions in Spain and reported by means of the Technical Assessment of the MSFD 2012 obligations (Spain, 7 February 2014).

According to the Milieu Ltd Consortium the initial assessment of the implementation of the MSFS regarding the descriptors tackled within the COMMON SENSE, was the following:

**North East Atlantic Region**

Concerning the **D5 Eutrophication**:

1. The **GES definition** established covers all the criteria of the 2010 Commission Decision and meets the minimum requirements. A good link between OSPAR Convention and MSFD implementation is established however, monitoring premises do not exist for water column samples/measurements. Details on the specific concentrations found, threshold, values and baselines are not provided by the Spanish report. The GES was assessed as partially adequate.

2. Concerning monitoring standards, OSPAR Common Procedure could be used to define GES in areas as having “no eutrophication problems”, but the information required for the OSPAR screening procedure is less complete than that required for MSFD reporting purposes.

3. Regarding the **Initial assessment** (assessed as adequate), considerable information (qualitative and quantitative) on most indicators was provided but limited information on impacts and loads to the sea was available. Trends and conclusive judgements (per reference to GES) are provided and a good link between MSFD and OSPAR concerning this Initial Assessment was established. It is stated that comprehensive data only exists in relation to some of the forms of inorganic nitrogen and phosphorus, and for that reason the assessment is made in relation to those substances.
4. **Targets** for D5 are partially adequate. Targets are qualitative and designed to achieve pressure reduction but predominantly from point sources are not sufficiently ambitious to reduce levels of individual pressures and impacts.

When assessing eutrophication sources it is necessary to make a difference between anthropogenic sources and natural sources. Nutrients in seawater include silicon, nitrogen and phosphorous organic compounds whose concentration depends on natural seasonal cycles together with the hydrological variability. Anthropogenic nutrients input would alter natural cycles increasing nutrients availability.

Anthropogenic inputs causing eutrophication are not very detailed and only temporally and spatially aggregated data. This data is difficult to compare with the dynamic of nutrients found in the water column. On the other hand there is no time data series of nutrients found in the water column long enough in order to define baseline values. Finally, most of the data available for the *Estrecho y Alborán* division is from the last two decades when the climate change has affected circulation patterns and to vertical water stability thus provably affecting nutrients balance.

In those areas where significant anthropogenic contamination occurs, it is necessary to determine the mechanism by means of which this contamination is generating undesirable effects. Among these processes there are overfishing, contamination episodes and organic matter enrichment. Cloern (2001)\(^{314}\) suggested that local circulation patterns of surface water bodies contribute to module and regulate nutrients enrichment. Overfishing, water bodies warming and organic matter enrichment are among the anthropogenic factors that can increase nutrients availability.

Eutrophication is not an isolated phenomena and it has to be assessed together with the other descriptors defined by the MSFD. The undesirable consequences caused by eutrophication depend on the quality status of other descriptors, and the other way around.

**Concerning D8 Contaminants:**

1. The **GES** was defined at criteria level. OSPAR EAC and EcoQOs are used as reference levels. The justification for not using EQS was considered sufficient. The definition of aggregation rules was considered as a good practice.

2. Regarding the **Initial Assessment** detailed description of sources of contamination was provided. Quantitative assessment on concentrations of synthetic and non-synthetic substances using internationally-recognized standards. Assessment of biological effects on biota. The initial assessment makes an aggregated judgement on the level of an impact from contamination in relation to GES. This initial assessment acknowledges gaps and provides details on future plans.

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The targets defined for D8 are potentially measurable and have associated indicators. Only three of the targets are quantified with thresholds and baselines.

Concerning D10 Marine Litter:

1. The GES is defined only at descriptor level and there is a lack of specification (e.g. threshold values used in the initial assessment). The GES definition was assessed as inadequate.
2. The initial assessment was assessed as adequate. Qualitative and quantitative assessment was carried out. Different types of litter were reported including spatial distribution. Reference conditions to be used for assessment of current status were provided (but they do not include microplastics).
3. The targets are specific for marine litter focus on reducing input of litter from various sources. Targets are potentially measurable but there is a lack of thresholds values. No target on the impact of litter on ecosystems.

Concerning D11 Underwater Noise:

1. The GES definition is assessed as inadequate since Spanish GES definition increases in scope the 2010 Commission Decision definition, and there is a lack of thresholds or reference values.
2. Initial assessment was assessed as adequate since the level of details provided was adequate concerning the data available. The acknowledgment of gaps and the details on how to remedy the gaps were provided.
3. The targets are very general and are rather expression of GES than actual targets focused on controlling human activities.

Mediterranean

Concerning the D5 Eutrophication:

1. The GES definition covers all the criteria of the 2010 Commission Decision. There is a good link between the MSFD and the MED POL.
2. Initial Assessment. Considerable quantitative and qualitative information on most indicators was provided while more limited information was available concerning impacts and loads to the sea. Trends are provided for only some indicators. The judgment that the GES is achieved does not seem to reflect the real situation.
3. Targets are qualitative and designed to achieve pressure reduction, but predominantly from point sources but they are not sufficiently targeted or ambitious to reduce levels of individual pressures or impacts.

Concerning D8 Contaminants:

1. The GES was defined at criteria level but assessed as inadequate. The OSPAR EAC and EcoQOs are used.
2. Detailed description of sources of contamination was provided for the Initial Assessment. Moreover a quantitative assessment of concentration of synthetic substances using internationally-recognized standards was provided.

3. Targets are potentially measurable and have associated indicators but only three are quantified with thresholds and baselines.

Concerning D10 Marine Litter:

1. The GES definition is assessed as inadequate since it is only defined at descriptor level and there is a lack of specification regarding threshold values used in the initial assessment. Moreover UNEP/MAP is not referenced.

2. A qualitative and quantitative assessment was made and different types of litter were reported including spatial distribution. Reference conditions for the GES were provided but no aggregated judgement was made because a lack of data.

3. The specific targets focused on reducing marine litter input from various sources. Potentially measurable but lack of threshold values were provided. No target was set regarding the impact of litter on ecosystem components because of the lack of data.

Concerning D11 Underwater Noise:

1. The GES is assessed as inadequate because it is defined only at descriptor level and it is slightly different from the Annex I of the MSFD which means increase in scope of the Spanish GES definition in comparison to the Commission Decision. There is also a lack of threshold or reference values.

2. The initial assessment was adequate and pressures were identified. The level of details provided is adequate considering the data available. Acknowledgment of gaps and details was provided on how to remedy the gaps.

3. The targets defined are very general and are rather expression of GES than actual targets focused on controlling human activities. There is a lack of threshold values and baselines.

7.9 Conclusions

7.9.1 External inputs/feedback

The Milieu Ltd Consortium found the following positive and negative aspects when assessing GES and targets setting and the initial assessment:

POSITIVE ELEMENTS/STRONG POINTS:

General points

1. Strong link with the RSC (OSPAR, Barcelona Convention)
2. Systematic use of EU requirements and standards
3. Coverage of all descriptors for all articles and sub-regions
4. Robust legal status of environmental targets and associated indicators
5. Extensive use of existing information/data
6. As a rule, information provided on gaps in monitoring and assessment data accompanied by plans to close these gaps, often incorporated in targets
7. On the whole, almost all relevant pressures have been identified and reported on, including microbial pathogens.
8. Frequent quantification of the parameters used for the initial assessment
9. Detailed descriptions of assessment methodologies for all descriptors

Good Environmental Status

1. Aggregation rules defined for a number of GES definitions (D5. Eutrophication, D8. Contaminants and Pollutants effects, D9. Contaminants in fish and other seafood, partly for D10 Underwater noise)
2. Spain is pointed since it has provided, a part from state-based targets, a number of targets which aim at filling knowledge gaps including through monitoring.
3. Spain is pointed since it provided a more detailed definition addressing both the risk of introduction and spreading of invasive NIS as well as the prevention of deterioration in environmental quality from invasive species which were already present.
4. Spain is pointed to provide, a part of pressures and impact-based targets, a number of monitoring or knowledge-filling targets.
5. In addition to targets for each of the descriptors, Spain has set generic targets which apply to all descriptors at a time in each of the sub-divisions. These relate to monitoring systems, public participation and access to information as well as the need to coordinate across competent authorities and stakeholders. Although very general, they set some basic principles which complement the more specific targets established by descriptor.
6. Spain has followed a water account approach for its economic and social assessment. The methodology has been comprehensively described and the analysis done for each of the marine sub-divisions. The cost of degradation has been estimated following a cost-based approach.
7. Spain addresses GES for all descriptors at the criteria level and sometimes at indicator level. GES has been further specified for the subdivisions. The definition of GES is often very detailed, expressed in a quantifiable manner and thoroughly described in accompanying text.
8. Spain applied methods for the North East Atlantic in the Mediterranean when these methods are not currently available there. This is a good point since methodology has been transferred from region to region.
9. Aggregation rules are defined for a number of GES descriptors (Descriptor 5, 8, 9).
10. Descriptors 5 and 8 are assessed as partially adequate.

Initial assessment

1. Extensive information is provided, which is often also quantitative and specific on the status of the marine environment. Justification is given on gaps in knowledge and information and how to address these gaps.
2. All relevant pressures have been identified and reported on, including microbial pathogens.
3. For several descriptors (e.g. Descriptor 5, 8, 3, Spain has made an assessment of the current status of their marine waters using the characteristics defined for their GES which shows that GES for Descriptor 3 and in coastal areas for Descriptors 5 and 8 is not met everywhere.
4. The assessment of features is comprehensive and covers all major habitat zones (although water column habitats receive only limited attention).
5. The initial assessment is assessed as being adequate for all descriptors.

Environmental targets
1. Spain provides a wide range of targets, addressing the pressures, the state or the impacts. It has defined a large set of biodiversity targets which can be applied to several descriptors. They are detailed and specific.
2. The targets for Descriptor 7 are extensive: there are six environmental targets with associated indicators.
3. The environmental targets and associated indicators have a robust legal status.

NEGATIVE ELEMENTS/WEAK POINTS:

General points
1. Complex reporting structure (many reports, lack of summaries or clear conclusions), which makes the reports difficult to use for non-technical purposes.
2. Lack of quantification of targets (threshold values, baseline), in contrast with the comprehensiveness of their initial assessment.
3. Descriptor 11 as inadequate as it is more an expression of GES and not specific enough. All other descriptors have been assessed partially adequate with regard to the environmental targets since they are described (extensively) qualitative and not quantified or miss thresholds.

Good Environmental Status
1. The description of GES for Descriptors 10 and 11 is very generic and qualitative and lacks specification.
2. Descriptors 10 and 11 are assessed as inadequate.

Initial assessment
1. Spain reported by means of many extensive reports which misses a comprehensive structure and lacks summaries and clarity on conclusions.
2. Impacts of pressures are not systematical reported on.

Environmental targets
1. In contrast to their comprehensiveness, most environmental targets are not quantified, miss thresholds or are not measurable.
RECOMMENDATIONS:

According to Milieu Ltd Consortium, Spain should:

1. **Improve GES definitions including through regional cooperation using the work of the Regional Seas Convention as much as possible focusing on quantitative aspects and baselines, with the aim to make GES measurable, focusing especially on those descriptors assessed as inadequate or partially adequate.**

2. **Ensure that the targets cover all relevant pressures, are SMART and sufficiently ambitious in order to achieve the requirements and timelines of the MSFD.**

7.9.2 **Ministry of Agriculture, Food and Environmental assessment**

The Ministry of Agriculture, Food and Environmental highlighted the following aspects as the main weak strong points of the MSFD implementation process in Spain carried out until July 2014.\

**Strong points**

1. The MSFD itself helps marine protection related tasks carried out by the Ministry of Agriculture, Food and Environment.
2. The MSFD addresses and approaches marine protection at the same level than terrestrial environment.
3. The MSFD has complemented RSCs work since it contributes with a mandatory regulatory framework for marine monitoring.
4. The MSFD is a very general directive and it is sometimes diffuse and complex, however, the directives objectives remain clear.
5. The implementation of the MSFD has been successfully achieved by Spain since it has been mentioned in the Commission Staff Working Document on the first steps in the implementation of the MSFD.\
6. Marine strategies development has been very helpful and positive in order to carry out the most exhaustive marine research compilation done so far.
7. CSIC and IEO are both historical and strong organizations on marine research constituting a strong point for the MSFD implementation in Spain.

Moreover, the IEO stated the following:

1. Before the MSFD, there wasn’t a regulatory framework of such magnitude for marine environment protection. Marine environment protection was included in several Directives (such as the Water Framework Directive, the Habitats Directive, Birds Directive and Regional...

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315 Interview to Ms. Ainhoa Pérez Puyol and Ms. Sagrario Arrieta Algarra (Directorate General for the Sustainability of the Coast and the Sea - Ministry of Agriculture, Food and Environment ) carried out within the framework of WP1.1. of the COMMON SENSE Project. July 2014.
316 Commission Staff Working Document on the first steps in the implementation of the MSFD - Assessment in accordance with Article 12 http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52014SC0049
317 Interview to Mr. Juan Bellas (Spanish Oceanographic Institute - Principal Investigator for the MSFD activities, 5-ESMARES) carried out within the framework of WP1.1. of the COMMON SENSE Project. September 2014.

The COMMON SENSE project has received funding from the European Union’s Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.
Conventions) which partially covered this issue. The MSFD is important because it has an ecosystem approach and encompasses any parameter and indicator related to marine protection.

2. The MSFD sets specific objectives and deadlines to be accomplished.

3. The ecosystem approach required by the MSFD, promoting balance between marine environmental status and resources exploitation, allows MS to achieve the GES established by them.

Weak points

1. The implementation of the MSFD on Spanish marine waters is difficult due to their extension, high diversity, unknown areas of water bodies and ecosystems. This opinion is also supported by the IEO.318

2. Member States and EC haven’t reached a consensus concerning the GES definition/details. Every country has defined the GES in a different way and detail level and thus there is not a common definition. However, the MSFD will be gradually and progressively implemented enabling future updating for GES definition.

3. Concerning exemptions to achieve GES (Article14(4), MSFD)319, they are not currently well defined and thus generate controversies. This topic is currently discussed since exceptions are key for monitoring program development and EC aims at reaching consensus. Exceptions can be used as an excuse in order to not to provide the proper information to the EC. It is difficult to establish a balanced exceptions regime since every MS has its peculiarities. The IEO supports this opinion.320

4. There are no methods to develop an integrated assessment of GES achievement.

5. Marine waters management competences are highly distributed (disaggregated) among different public bodies hinders the marine research knowledge integration process. This requires a big effort from stakeholders in order:
   i. To avoid operations overlapping
   ii. To coordinate monitoring
   iii. To promote information and monitoring the harmonization, standardization and integration.

6. To share information and resources for the implementation of MSFD (e.g. some monitoring initiatives could be integrated among different public authorities and organisms).

7. Limited scientific knowledge, especially on some marine (e.g. Canary) areas and fields (e.g. microplastics).

8. High economic cost of GES achievement.

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318 Interview to Mr. Juan Bellas (Spanish Oceanographic Institute - Principal Investigator for the MSFD activities, 5-ESMARES) carried out within the framework of WP1.1. of the COMMON SENSE Project. September 2014.

319 MS can declare they cannot achieve GES because of (a) action for which it is not responsible; (b) natural causes; (c) force majeure; (d) overriding public interest; (e) insufficient time; (f) no significant risk to the marine environment; or (g) disproportionate costs (Article14(4), MSFD) http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32008L0056.

320 Interview to Mr. Juan Bellas (Spanish Oceanographic Institute - Principal Investigator for the MSFD activities, 5-ESMARES) carried out within the framework of WP1.1. of the COMMON SENSE Project. September 2014.
10. Environmental policies do not easily penetrate into different sectors (e.g. environmental policies are not easily applied by industry if any specific or mandatory regulation is developed).
11. The coordination among Mediterranean countries is more difficult than in Atlantic countries due to the unfavourable economic situation of Mediterranean countries. However this handicap does not necessarily affect the GES limits (e.g. the Baltic Sea has severe environmental problems). This opinion is supported by the IEO.\(^\text{321}\)

Moreover, the IEO stated that no coordination mechanisms, apart from the existing ones, have been activated for the MSFD implementation.\(^\text{322}\)

**Barriers and opportunities to support the MSFD implementation**

Apart from the strong points mentioned in the last section, the following are highlighted as barriers and opportunities to support the MSFD implementation:

1. Availability of European funds promote and enhance the MSFD implementation.
2. Monitoring Programs are highly costly. In some cases the economic cost to monitor GES hampers the implementation of integrated measures.
3. MSFD implementation directly affects different sectors. Nevertheless, environmental policies do not easily permeate into industrial sectors and policies (e.g., social and economic policies).
4. The GES assessment enabled to assess the available information.
5. It is necessary to properly communicate marine protection and management work done in order for society to well understand what has been done and what is happening.
6. A social level, as any environmental policy, it will benefit society with welfare.
7. Certain industrial sectors such as fisheries could be reluctant to accept the MSFD implementation since it could impose some additional requirement for the sector.
8. The Spatial Planning Directive will be affected by the MSFD premises.
9. The MSFD will constitute a conflict solving tool since many conflicts arise and will have to be solved by means of discussions, agreements and measures program.

**7.10 Monitoring Programme**

**7.10.1 Introduction on the Monitoring Programs**

Once marine strategies are defined, the following step is to establish the monitoring programs. The main objective of the monitoring programs is to permanently assess the marine environment GES. With this aim in view, the monitoring programs will focus on providing an answer for:

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\(^\text{321}\) Interview to Mr. Juan Bellas (Spanish Oceanographic Institute - Principal Investigator for the MSFD activities, 5-ESMARES) carried out within the framework of WP1.1. of the COMMON SENSE Project. September 2014.
\(^\text{322}\) Interview to Mr. Juan Bellas (Spanish Oceanographic Institute - Principal Investigator for the MSFD activities, 5-ESMARES) carried out within the framework of WP1.1. of the COMMON SENSE Project. September 2014.

The COMMON SENSE project has received funding from the European Union’s Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.
1. The indicative elements lists included in the Annex III and V of the MSFD.

2. Criteria and indicators applicable to each of the descriptors established by the Commission Decision 210477/UE

3. Environmental targets defined by every Member State corresponding to the Article 10 of the MSFD.

In addition, monitoring programs have to be compatible among marine regions or subregions. In this sense, monitoring programs will have to be developed in a coherent and integrated way promoting results comparability and to have into account transboundary impacts and effects.

The Ministry of Agriculture, Food and Environment has developed the Monitoring Programs Proposal that has been under a public consultation process until September 30th, 2014. This proposal has been developed by means of: (1) scientific-technical discussions on indicators; (2) an inventory of the existing monitoring programs; (3) proposal on the structure of monitoring programs and sub-programs and, (4) Discussion with monitoring programs responsible authorities on the programs design.

The Ministry of Agriculture, Food and Environment, Pablo Saavedra, cited that “it is necessary to work for an appropriate incorporation of existing monitoring programs, carried out by the Spanish Autonomous Communities on the littoral, as well as with other complementing monitoring activities which will be in charge of the Ministry of Agriculture, Food and Environment”. There are many different ongoing monitoring programs that could cover some of the MSFD requirements. This monitoring programs aim at achieving the requirements set by other Directive (WFD, Habitats Directive, Birds directive and among others, RSCs (OSPAR and Barcelona) and policies (e.g. Common Fisheries Policy).

One of the MSFD requirements is to take into account the mentioned ongoing monitoring programs in order to identify what aspects of the MSFD are already covered and which are the remaining gaps.

In this sense, the Ministry of Agriculture, Food and Environment has developed an inventory in order to gather, by means of a short questionnaire, detailed information (parameters, matrixes, approach, etc.) on the available monitoring programs. Around 300 questionnaires have been received and analyzed by the Ministry and a characterization sheet will be produced and published for each of these questionnaires. This inventory enabled the Ministry to assess if each of these monitoring programs will be integrable to the MSFD monitoring program for Spanish marine waters or not.

Once the gaps have been identified, the Spain monitoring program was completed with new monitoring activities that will enable a full implementation of the MSFD. With this aim in view, the Ministry is planning to work mainly with the IEO and the CEDEX but they will also work with other organisations and authorities such as regional governments. Some of these activities will be directly contracted but for some others a tender will have to be published. The main authors of the

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The COMMON SENSE project has received funding from the European Union’s Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.
monitoring programs are the IEO\textsuperscript{324}, Tragsatec\textsuperscript{325}, Ministry of Agriculture, Food and Environment\textsuperscript{326}, SEO\textsuperscript{327}, Naval Technology and Sea Centre\textsuperscript{328} as well as other scientific organizations and NGOs. For further information concerning the authors please check the document “\textit{Marine Strategies. VI. Monitoring Programas. Authors.”}\textsuperscript{329}

In this sense, the IEO has elaborated a proposal of the monitoring programs for the Ministry of Agriculture Environment, Food and Agriculture. This proposal will be assessed and adapted/optimized by the Ministry according to different criteria (e.g. available budget) and send to the EC for its assessment. IEO has structured the work by descriptors and assigned one responsible person (researcher) per descriptor resulting in a team gathering more than 100 people. They have addressed all MSFD descriptors, except for Descriptor 9, addressed by the Spanish Agency for Consumption, Food Safety and Nutrition (Agencia Española de Consumo, Seguridad Alimentaria y Nutrición)\textsuperscript{330}. Regarding Descriptor 11 an external company, specialized on underwater noise, has been involved.\textsuperscript{331}

When possible, for each of the monitoring activities included in the Monitoring Program for Spain a responsible organization will be assigned. Among these organizations, regional governments, the Ministry of Public Works and the General Secretary for Fisheries are already included.

The European Commission is flexible as far as Member States submit a planned monitoring program scheduling when the different preparatory and monitoring activities will be implemented and including first and following steps foreseen. This allows MS to carry out a progressive implementation.

7.10.2 Monitoring programs regarding the descriptors tackled by COMMON SENSE

The Ministry of Agriculture, Food and Environment has published the following documents concerning the different steps taken for the definition of the monitoring programs:

1. Indicators Proposal
2. Analysis of existing monitoring programs.

\textsuperscript{324} http://www.ieo.es/
\textsuperscript{325} http://www.tragsa.es/es/el-grupo/empresas/Paginas/tragsatec.aspx
\textsuperscript{326} http://www.magrama.gob.es
\textsuperscript{327} http://www.seo.org/
\textsuperscript{328} http://www.ctnaval.com/CC/jsp/Portal/PortadaPortal.jsp?ce=CTNM
\textsuperscript{330} Agencia Española de Consumo, Seguridad Alimentaria y Nutrición http://consumo-inc.gob.es/queeselinc/home.htm?id=10
\textsuperscript{331} Interview to Mr. Juan Bellas (Spanish Oceanographic Institute - Principal Investigator for the MSFD activities, 5-ESMARES) carried out within the framework of WP1.1. of the COMMON SENSE Project. September 2014.

The COMMON SENSE project has received funding from the European Union’s Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.
### 7.10.3 Indicators proposal

The Monitoring Programs have linked each of the environmental objectives set to the associated indicators and the specific indicators set by the Monitoring Program. These indicators have been classified among the following categories: operative, status, impact and pressure (see the table below).

*Table 33. Link between environmental objectives and proposed associated indicators in the Spanish monitoring programs*[^332]

<table>
<thead>
<tr>
<th>Objective code (according to the Resolution of the State Secretary for Environment and as approved by the Council of Ministers on the 2nd of November of 2012)</th>
<th>Associated indicator according to the MSDF</th>
<th>Suggested indicators</th>
<th>Indicator Code</th>
<th>Indicator typology</th>
</tr>
</thead>
<tbody>
<tr>
<td>B.1.3 NOR, ESAL</td>
<td>Nutrients concentration ; Nutrients level</td>
<td>Inorganic nutrients (water column)</td>
<td>EUT-nutri</td>
<td>Status</td>
</tr>
<tr>
<td>B.1.3 SUD</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B.1.3 LEBA, CAN</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B.1.4: NOR, ESAL</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B.2.1</td>
<td>Contaminants in sediments (levels and trends)</td>
<td>Metals concentration in sediments (Hg, Cd, Pb)</td>
<td>CONT-met-b</td>
<td>Status</td>
</tr>
<tr>
<td>B.2.2 NOR, SUD, LEBA, ESAL</td>
<td>Contaminants in biota (levels and trends)</td>
<td>Metals concentration in biota (Hg, Cd, Pb)</td>
<td>CONT-met-s</td>
<td>Status</td>
</tr>
<tr>
<td>B.1.5: NOR, LEBA, ESAL B.1.4: SUD, CAN</td>
<td>Quantity of marine litter (coast and/or continental platform)</td>
<td>Microparticles in sediments</td>
<td>BM-mic</td>
<td>Status</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Microparticles in biota</td>
<td>BM-micplaya</td>
<td>Status</td>
</tr>
<tr>
<td>-</td>
<td>Other status indicators</td>
<td>Microparticles at the beach</td>
<td>BM-micro</td>
<td>Status</td>
</tr>
<tr>
<td>-</td>
<td></td>
<td>Microparticles in water</td>
<td>BM-micplaya</td>
<td>Status</td>
</tr>
<tr>
<td>-</td>
<td>Other status</td>
<td>Ambient noise</td>
<td>RS-amb</td>
<td>Status</td>
</tr>
</tbody>
</table>

[^332]: Ministry of Agriculture, Food and Environment. 

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EUTROPHICATION
Concerning inorganic nutrients, concentration in the water column (μgat/L) of the following is considered to be monitored in all Spanish marine sub-divisions: Total Phosphor (PT), Total Nitrogen (NT), Nitrate (NO3-N), Nitrite (NO2) and Ammonia (NH4-N). This indicator is included in both OSPAR and Barcelona Conventions.

CONTAMINATION
Concerning Heavy metals, concentration will be only monitored in biota and sediment being out of the scope of the COMMON SENSE project.

MARINE LITTER
Regarding microparticles in water, indicator tackled within the COMMON SENSE Project, it aims to record the quantity and distribution of microparticles (and trends) and, when possible, microplastics composition. It will be necessary to develop a study in order to fix reference levels and/or use existing regional studies.

The number and nature of microplastics (density and specially plastics) would be the parameters quantified.

These requirements will be implemented in all the littoral areas: North Atlantic, South Atlantic, Estrecho de Alborán, Levantino Balear and Canary.

This is a common indicator for the Barcelona Convention (nº17 in ECAP) and it includes the tendencies in the microplastics quantity. This is a common indicator for the OSPAR Convention so it will be soon included.

UNDERWATER NOISE
Regarding ambient noise indicator, tackled within the COMMON SENSE Project, it will record trends of ambient noise level within 1/3 octave bands and 125Hz (center frequency) (re 1µPa² s; average noise level in these octave bands over a year) measured by observation stations and/or with the use of models if appropriate.

Necessary parameters for the measures done in observation stations:

1. Noise record arising from hydrophones.
2. Date and position.
3. Desirable: sea status parameters (temperature, pressure and salinity).


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Necessary parameters for modelling estimations:

1. Sea conditions parameters (temperature, pressure and salinity).
2. Bathymetry of marine divisions.
3. Other environmental variables relevant for acoustic propagation (e.g. marine seabed characteristics).

Noise sources data:

1. Position and distribution of noise sources (e.g. AIS) and typology (e.g. vessel typology)
2. Spectrum of noise sources (e.g. different typology of vessels).
3. Source depth.
4. Platform speed.

Parameters integration:

1. Records of measures done will be processed by means of signal treatment methods.
2. Parameters for modelling estimation will be integrated in a propagation model that will allow the elaboration of an ambient noise map.
3. Noise records arising from measures campaigns and/or from observation stations will be used to correct and/or validate noise estimations done by the model.
4. Trends according to spatial and temporal scales will be determined as well as the complete function of accumulated distribution (%).

Indications for methodological implementation of this indicator have been established in the Methodological Guide on Underwater Noise developed by the sub technical group TSG-NOISE.

7.10.4 Analysis of existing monitoring programs

The Ministry of Agriculture, Food and Environment, has prepared a questionnaire in order to gather information on the existing monitoring experiences/activities carried out, within Spain marine waters, concerning MSFD descriptors. This questionnaire was available in the Ministry’s website and it was sent to some organisations including the Autonomous Communities. The information gathered was identified and gaps to be covered as well as major issues were identified. A second call was made to Administrations, institutions and identified organizations. The Ministry has made available the list of the entities consulted in its website. A register of 352 monitoring activities has been elaborated and it is available in the Ministry’s website.

Concerning eutrophication, 26 programs were identified on several indicators of Descriptor 5. In general, the information gathered is quite limited. The existing programs are related to the Water Framework Directive, OSPAR Convention and Barcelona Convention work carried out concerning this descriptor. Some of these programs are spatially or timely limited but some others can be integrated into the MSFD monitoring programs.

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339 Ibidem

The COMMON SENSE project has received funding from the European Union's Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.
Regarding marine litter, monitoring experiences are limited and focused on macro litter in beaches, seabed and water surface. An important gap is detected concerning marine litter monitoring in biota. 6 programs, focusing on cetaceans, have been identified concerning underwater noise. However, the information gathered by these programs is not sufficient neither adequate to cover MSFD monitoring requirements.

Regarding heavy metals, the EMEP Program (European Monitoring and Evaluation Programme) is mentioned, offering trans-bordering information regarding nutrients, persistent pollutants and heavy metals.

7.10.5 Monitoring programs proposal

Monitoring programs aim at continuously monitoring good environmental status of marine environment and environmental targets of marine strategies. With this aim in view they will have to be:

1. Coordinated, compatible (with other existing monitoring experiences), coherent (concerning sampling strategies) and comparable (within Member States).
2. Structured taking into account existing monitoring efforts (HD, BD, WFD, and RSC).
3. Compatible with the “Marine knowledge 2020”.
4. Adaptable to emerging issues/questions.
5. Suitable for assessment needs taking into account risk analysis and precaution approach.

It has to be taken into account that Spanish waters are under OSPAR Convention (North Atlantic, South Atlantic regions) and Mediterranean Convention (Estrecho and Alborán and Levantino-Balear regions). Macaronesia region (Canary Islands) is not currently included in any regional sea convention.

Monitoring Programs development is based on the environmental targets set and the associated indicators. Once existing monitoring activities were detected and remaining gaps were identified, a proposal on monitoring programs and subprograms was presented and discussed and adjusted by the MSFD responsible authorities. Programs and subprograms have been structured according to EC working groups. Not all programs are applicable to all Spanish marine regions.

Several meetings have been carried out with relevant agents, organizations and public authorities in order to involve them in the monitoring processes. The following needs came out during these meetings: (1) optimize existing resources and (2) compile/share data generated by different public organizations, (3) common standard proposals and protocols to ensure data comparability.

Among the different monitoring programs established by the Ministry of Agriculture, Food, and environment, the following address the descriptors tackles by COMMON SENSE:

1. Eutrophication (EUT)

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The COMMON SENSE project has received funding from the European Union's Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.
2. Contaminants (CONT.)
3. Marine litter (BM)
4. Underwater noise (RS)

The scientific community also had a relevant role in these meetings addressing monitoring methods and technologies for the MSFD descriptors/indicators.

7.10.5.1 Eutrophication (EUT)

Eutrophication monitoring programs have been designed in order to enable the differentiation among natural variability caused by alien contributions. The following table summarizes the Eutrophication programs that address COMMON SENSE descriptors:

Table 34. Eutrophication monitoring programs in Spain


The COMMON SENSE project has received funding from the European Union’s Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.
**EUT. Eutrophication subprograms**  
**Indicators (concerning COMMON SENSE PROJECT)**  
**Competent authority***  
**Existing Programs according to the codes established**  
**Additional needs**  
**Marine Divisions Application**  
**Observations**

| EUT 1. Nutrients, oxygen and phytoplankton in coastal waters. | EUT- NUTRI | MAGRAMA and AACC (according to the Water Framework Directive) | EA: 039, 030, 086 (MEDPOL)  
LB: 017, 019, 020, 024 030, 039, 142, 144, 168, 169, 186, (MEDPOL)  
NA: 029, 033, 041, 083, 088, 089 (IEO: STOCA and RADIALES)  
SA: 031, 081 (IEO: STOCA and RADIALES)  
C: a new monitoring program is suggested. | Canary: additional sampling stations | All of them | Sampling methodology (including periodicity, stations position, depths) changes from region to region. |
|---|---|---|---|---|---|
| EUT 2. Nutrients, oxygen and phytoplankton in non coastal waters. | EUT- NUTRI | MAGRAMA | C: 032 (RAPROCAN)  
EA and LB: 030, 039 (MEDPOL)  
NA: 029, 033  
SA: 031 (IEO: STOCA and RADIALES) | EA, LB, NA, SA: additional monitoring stations  
Canary: additional sampling stations | All of them | In general sampling will be done quarterly. At least a change of 50% in nutrients concentration will be detected with a provability factor of 0.05 and a potency of 95% (6 years). |

* MAGRAMA (Ministry of Agriculture, Food and Environment), AACC (Autonomous Communities)  
**NA( North Atlantic) , SA (South Atlantic), (EA) Estrecho and Alborán, LB (Levantino-Balear) and C (Canary)

### 7.10.5.2 CONTAMINANTS (CONT) 

Concerning contaminants monitoring programs only met-b (metals in biota) and met-s (metals in sediment) are addressing heavy metals but none of them does it for the water column, being out of the COMMON SENSE scope.

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The COMMON SENSE project has received funding from the European Union’s Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.
7.10.5.3 MARINE LITTER (BM)\(^{344}\)

Microplastics (plastic fragments smaller than 5mm) are classified as primary and secondary according to their origin:

1. Primary microplastics: manufactured to be directly used as they are produced (e.g. cosmetics, industrial abrasives, pellets, etc.).
2. Secondary microplastics: those microplastics arising from plastics fragmentation.

Spanish monitoring program for marine litter aims at ensuring GES for Descriptor 10, i.e. ensuring that marine litter amount present in marine waters is not dangerous for marine and littoral environment.

The following table shows the monitoring sub-program that include microplastic particles in water.

Table 35. Microplastics monitoring programs in Spain\(^{345}\)

<table>
<thead>
<tr>
<th>CONT. Contaminants subprograms</th>
<th>Indicators (concerning COMMON SENSE PROJECT)</th>
<th>Competent authority*</th>
<th>Existing Programs according to the codes established (^{1})**</th>
<th>Additional needs**</th>
<th>Marine Divisions Application*</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>BM-4: Microparticles in water</td>
<td>BM-micro</td>
<td>IEO / MAGRAMA</td>
<td>No.</td>
<td>Yes</td>
<td>All of them</td>
<td></td>
</tr>
</tbody>
</table>

* MAGRAMA (Ministry of Agriculture, Food and Environment), AACC (Autonomous Communities)
**NA( North Atlantic), SA (South Atlantic), (EA) Estrecho and Alborán, LB (Levantino-Balear) and C (Canary).

7.10.5.4 UNDERWATER NOISE (RS)

No baseline values for anthropogenic underwater noise have been established in Spain since and there is not a good definition for Good Environmental Status for this descriptor. This is because there is not a systematic register of impulsive noise sources. There is no information concerning spatial

\(^{345}\) http://www.magrama.gob.es/es/costas/participacion-publica/VI.3_Propuesta_programas_de_seguimiento_tcm7-336865.pdf

The COMMON SENSE project has received funding from the European Union’s Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.
distribution of ambient noise in every marine sub-division and its evolution. There is also a lack of knowledge regarding the impact of underwater noise on marine species.

Table 36. Underwater noise monitoring programs in Spain

<table>
<thead>
<tr>
<th>RS Underwater noise subprograms</th>
<th>Indicators (concerning COMMON SENSE PROJECT)</th>
<th>Competent authority*</th>
<th>Existing Programs according to the codes established**</th>
<th>Additional needs**</th>
<th>Marine Divisions Application **</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>RS.1. Spatial and temporal distribution of impulsive noise of low and medium frequency (impulsive noise)</td>
<td>RS1-IMP</td>
<td>MAGRAMA and the Ministry of Industry, Energy and Tourism (MINETUR)</td>
<td>-</td>
<td>This is a monitoring program of new design</td>
<td>All of them</td>
<td>The aim of this program is to gather valuable information regarding this descriptor but it will not be possible to know if GES has been achieved. A list of impulsive noise generating activities that surpass the thresholds established in the methodological guide will be created. The format and content of this register will be adapted to the OSPAR protocol.</td>
</tr>
<tr>
<td>RS.2. Low frequency continuous noise (ambient noise)</td>
<td>RS-AMB</td>
<td>MAGRAMA</td>
<td>-</td>
<td>This is a monitoring program of new design</td>
<td>All of them</td>
<td>The aim of this program is to gather valuable information regarding this descriptor but it will not be possible to know if GES has been achieved. This program will allow providing an underwater noise map by means of a validated propagation model created using real measurements</td>
</tr>
</tbody>
</table>


The COMMON SENSE project has received funding from the European Union’s Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.
The COMMON SENSE project has received funding from the European Union's Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.

**7.10.5.5 PRES SUBPROGRAMS: PRESSURES**

There are several transversal monitoring programs related to environmental pressures linked to nutrients, microplastics and heavy metals inputs: riverine inputs, atmospheric deposition and punctual contamination sources.

**7.10.6 Pros and cons of the Monitoring Program for Spanish waters**

Ministries are aware that Monitoring Programs are complex but feasible to implement. One of the hardest tasks to be carried out is the coordination and integration of the different ongoing monitoring activities in order to provide the program of coherence.

The large geographic coverage will have to be overcome. In this sense, the European Commission has insisted that monitoring programs should be coherent and implemented to those areas with risk of pressures and impact, or to those reference areas such as MPAs. These criteria will be applied for those descriptors that Spain would not be able to monitor along the whole marine areas under Spanish jurisdiction.

Concerning underwater noise, monitoring is currently inexistent. OSPAR is planning to analyze the need of a regional plan for underwater noise monitoring in the Atlantic area by 2017. The Ministry is also in contact with underwater noise expert of NOAA (National Oceanic and Atmospheric Administration).

Concerning marine litter monitoring, it is currently foreseen to be implemented in beaches and platform marine bed (sediment). There are not currently baseline monitoring values for microplastics since there are not enough time line series. Once these data is available, baseline values will be established at a regional level integrating coordinating the different involved countries.

The IEO is developing a new methodology to monitor microplastics in the water column. The CEDEX is developing a methodology to measure and monitor microplastics in beach sand and sediments.

Regarding heavy metals monitoring, Spain will focus on sediments and biota according to the Directive of Priority substances (Directive 2013/39/EU). This Directive establishes biota EQS for...
mercury but concerning cadmium and lead, they can be measured either in water or in biota/sediment (Article 3(3)). Heavy metals in the water column are really difficult to measure due to its low concentration and, in addition, it is difficult establish a pollution level taking into account the results obtained. In this sense, results have to be compared with biota and sediment values.

According to Article 3 (6), Member States shall arrange long-term trend analysis of concentrations of those priority substances that tend to accumulate in sediment or biota, among them, mercury, cadmium and lead. However, no EQS are fixed for these three substances in biota/sediments. In this sense, Spain has tried to fix EQS for these substances two years ago but unfortunately a consensus has not been reached.

Some autonomous communities measure heavy metals in coastal waters and this data will be integrated in the monitoring programs of the MSFD.

Concerning eutrophication and heavy metals, monitoring gaps are only found in the Canary sub-division. Nevertheless, in the remaining sub-division main eutrophication and heavy metals monitoring requirements are already covered.

Moreover, there are many differences between marine sub-divisions. For instance Canary is not under any RSC so monitoring in this area is very poor. Anyway this does not mean that the GES is worse than in the other marine regions. On the other hand, every Autonomous Community has its own laboratories, indicators and monitoring methods. In this sense, a big effort has to be done in order to integrate data arising from currently monitoring activities. IEO has been also carrying out integrated monitoring activities at a National level.

Once monitoring programs are established, some countries cannot afford implementation costs. This happens indistinctly within the Mediterranean and OSPAR members. Nevertheless, southern Mediterranean countries have a more complex economic situation. In this case, politicians have the power to decide to invest or not in marine monitoring.

Taking into account the aspects mentioned above the following measures, good practices/technologies and synergies established are highlighted:

**How to improve current monitoring in order to comply with MSFD requirements:**

1. To detect and cover monitoring gaps.
2. To detect and focus those vulnerable/sensitive areas where pressures and impacts are higher.
3. To invest in technology improvement.
4. To invest in cost-efficient and feasible technologies.
5. To promote the investment of private sectors on monitoring.

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348 Interview to Ms. Ainhoa Pérez Puyol and Ms. Sagrario Arrieta Algarra (Directorate General for the Sustainability of the Coast and the Sea - Ministry of Agriculture, Food and Environment) carried out within the framework of WP1.1. of the COMMON SENSE Project. July 2014.

The COMMON SENSE project has received funding from the European Union’s Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.
Good monitoring practices/technologies highlighted by the Ministry of Agriculture, Food and environment: 349

1. Satellite nutrients monitoring is very useful although it has to be contrasted with in situ samples. It is very useful to detect problems because it is easy to use and fast.
2. Novel monitoring methods such as passive sampling show promise for future application. Passive samplers could be very useful in order to reduce costs, expand sampling areas and to detect where contaminants are accumulated.
3. Concerning nutrients and heavy metals, both MEDPOL and CEM are reference methodologies for their monitoring.

Moreover, the IEO is working on the international intercalibration for eutrophication and heavy metals.

Different initiatives coordinated by the Ministry of Agriculture, Food and environment in order to find synergies among different activities carried out: 350

1. The Ministry of Agriculture, Environment and Food is coordinating those organizations with available research vessels in Spain (CSIC, IEO, the Marine Hydrographic Institute – IHM – and the General Secretary for Fisheries) in order to optimise resources used in oceanographic campaigns. It is very important to know the requirements of the projects and if possible to share and save resources and avoid overlapping.
2. Fisheries sector could help to monitor some parameters related with fisheries activities (e.g. in MPAs).
3. Fisheries inspection vessels are systematically providing and reporting data concerning cetaceans sighting. Some NGOs provide also data on cetaceans and biodiversity.
4. An initiative that is planning to be implemented is to force all those new marine projects (e.g. offshore energy platforms) that require an environmental impact assessment to include the monitoring of some of the indicators of the MSFD in their environmental surveillance programme.
5. The Ministry of Agriculture, Environment and Food is discussing with the Autonomous Communities the possibility to include the monitoring of MSFD parameters in the environmental surveillance programme of those projects authorized by regional governments (e.g. aquaculture plants).

Moreover, the Ministry of Agriculture, Food and Environment will start working in 2015 in a marine database platform in order to gather and unify MSFD related data. This platform would enable the

349 Interview to Ms. Ainhoa Pérez Puyol and Ms. Sagrario Arrieta Algarra (Directorate General for the Sustainability of the Coast and the Sea- Ministry of Agriculture, Food and Environment) carried out within the framework of WP1.1. of the COMMON SENSE Project. July 2014.
Ministry to share this data with the EC and RSCs and it will be interoperable with other platforms (e.g. OSPAR platform, WISE-WFD database, etc.). According to the Aarhus Convention, the Ministry is obliged to share this data guaranteeing effective access to information and public participation, among others.

**Stakeholders’ involvement**

As previously mentioned the implementation of the MSFD in Spain has been mainly carried out by the Ministry of Agriculture, Food and Environment in cooperation with CEDEX and IEO. Moreover, around 500 experts from public and private organizations have contributed with their advice and contributions to this process, especially on the marine strategies development.

Open workshops have been held in order to organize monitoring programs and to receive contributions from different kind of experts from public and private organizations, universities and different autonomous communities. Workshops results will be gathered in monitoring programs. The Ministry is willing to keep working with these working groups of experts.

According to MAGRAMA, neither public nor private cohesion/pressure has been received from both public and private sector.

**7.10.7 Measures Program**

The Ministry of Agriculture, Food and Environment will be responsible for the development, coordination and management of the Measures Program. However, many other competent authorities will be involved to implement each of the measures foreseen by the program. These competent authorities include different ministries, regional governments (Autonomous Communities) and private entities.

The measures program can result in new regulatory frameworks according to the detected needs. An example of this is the intention to develop a National Plan for Marine Litter. Some measures have to be regulated by the EU before being regulated by the MS.

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ANNEX I. REA PROTOCOL: TASK 1.2

Case studies:
1. Ireland
2. Poland
3. Spain

STRUCTURE OF THE DELIVERABLE

I. IMPLEMENTATION OF THE MSFD INTO NATIONAL LEGALS SYSTEMS
   1. Short description of the MSFD;
   2. Problems and issues with it implementation across Europe;
   3. Challenges and way forward;

II. NATIONAL IMPLEMENTATION IN MEMBER STATES
    1. Legal framework in each Member States
       i. Describe the legal acts through which MFSD was implemented into national legislation; provide name and relevant number, and a short description of the overall act if applicable;
       ii. Provide information on authorities/agencies that are responsible for implementation of MSFD; describe their other duties, if applicable;
    2. Initial Assessment
       i. Has the initial assessment been completed? Who was responsible for its preparation?
       ii. What are the main lessons learnt/major conclusions from these assessments? Please comments separately on the economic and social analysis within the Initial Assessment.
       iii. Environmental targets established

III. CASE STUDIES
    1. Short introduction of the case studies. Include the following issues in the introduction:
       i. A short overview of the country and its marine areas;
       ii. Socio-economic context of the coastal and marine areas in the country;
       iii. Administrative structure of the country, the level of its autonomy and relations to marine areas and/or implementation of MSFD;
       iv. Competent authorities/agencies for managing marine areas, level of collaboration, unique or overlapping competences;
    2. National regulatory frameworks:
       i. What national regulatory framework -- including legal acts -- is used to implement MSFD? Please give a brief background for each legal act.
       ii. What actions and measures have been put forward by these policies? What are their stipulations concerning GES and environmental monitoring?
       iii. Are there any other pieces of legislation or other incentives that support or hinder implementation of MFSD/marine monitoring? How is it synchronized with other pieces of marine related legislation?
iv. What other policies and strategies can influence implementation of MSFD? Describe the potential and existing interactions, common or conflicting policy goals.

v. Describe the governance approach being used to implement MSFD. Is its more top-down or bottom-up? If possible, discuss shortly its effectiveness.

3. Initial Assessment

i. Describe how the Initial Assessment was prepared. What entity was responsible for its preparation? What are the relationships between this entity and the authority/agency responsible for MSFD implementation?

ii. What are the general lessons learnt and major conclusions arising from this assessment?

iii. Describe the results of the assessment concerning Common Sense descriptors. What are strong and weak points concerning these descriptors and methodology used?

iv. Describe the results and methodology used for economic and social analysis prepared within the assessment. What are the strong and weak points of this analysis?

v. Stakeholders involvement: what was the stakeholders involvement – if any – during the preparation of this assessment; who was involved and how it influenced the assessment?

4. Monitoring

i. What monitoring strategies have been implemented concerning the descriptors in Common Sense? What organization is responsible for this implementation?

ii. What monitoring methodologies (and which sensors) have been/are used? Does the monitoring include reference parameters (pH, temperature, pressure, bathymetry, etc)? Are these currently operating? Have these changed after introduction of MSFD?

iii. What areas/depths are already covered?

iv. Which monitoring platforms are used?

v. How are data arising from monitoring stored? Are they publicly available? What are the sharing protocols?

vi. Which are the main monitoring gaps? What are the probable reasons for these gaps?

vii. Which are the best/bad monitoring practices? What are the possible reasons for bad practices?

viii. Which are the MSFD monitoring requirements not covered by current monitoring activities? What might be the reasons for these omitting?

5. Results of the MSFD implementation process

i. What are the results of MSFD implementation process? Are extra efforts needed to implement MSFD?

ii. What are the major barriers and challenges to implement MFSD and marine monitoring?

iii. What is the stakeholders involvement in the MSFD implementation?

iv. Environmental targets

ANNEX II. SEMI-STRUCTURED INTERVIEWS GUIDELINES – NATIONAL LEVEL

NOTE: An introduction on the COMMON SENSE Project and on the four descriptors we focus on should be made by the interviewer.

I. Questions concerning marine governance

1. What is your role in the organization and what are your organization main activities and interest concerning marine governance and monitoring?

2. What is the role and interest of your organisation in MFSD? Does MFSD support or hinder your activities? Why?

3. What is your opinion on MFSD? Is this directive consistent, and are its goals properly defined? Is meaning of GES practicable? Are exceptions to achieve GES properly defined\(^{352}\)? What could be their consequences for MSFD implementation?

II. Questions on MFSD implementation

4. What are the national regulatory frameworks used to implement MFSD?

5. What organisations are working in MSFD implementation? Is there an overlap of competences between these organizations? What are the consequences of this overlap? Do you think other agents should also be involved? If so, what these agents are?

6. How do you assess the MFSD implementation process? What were the major difficulties in its implementation?

7. What are the most important drivers to support MFSD implementation? What are the most important barriers for achieving GES?

8. How do you assess the MFSD Initial Assessment for both (i) environmental, and (ii) social and economic aspects? Do the outcomes of this assessment reflect the real state of the marine waters in ‘Country X’?

9. What was the stakeholders involvement, and has this involvement influenced the process at all? Does participation increase the potential success of MSFD?

10. What was the involvement of scientific community, and has this involvement influenced the process at all? Is the MFSD Initial Assessment based on scientific evidence only? Or have other factors taken precedence? What should be the role of science in the MFSD implementation?

11. How do you assess the impact of the future implementation of MSFD in ‘Country X’? What might be the results for the environment, economy and society?

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\(^{352}\) MS can declare they cannot achieve GES because of (a) action for which it is not responsible; (b) natural causes; (c) force majeure; (d) overriding public interest; (e) insufficient time; (f) no significant risk to the marine environment; or (g) disproportionate costs (Article 14(4), MSFD).

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III. Questions on marine monitoring

12. How is marine monitoring organized right now in ‘Country X’? Does it allow for proper management of the marine ecosystems? If not, what are the major problems/monitoring gaps? What should be done to improve this monitoring?

13. Does the current monitoring match the requirements of MFSD concerning eutrophication, heavy metals contamination, marine litter (microplastics) and underwater noise? If not, what will or should be done to change this situation?

14. What are the major barriers to implement MFSD-required monitoring for the mentioned descriptors? Are they of political, economic, social or technological character?

15. Are there relevant technologies to support MFSD-related monitoring, especially in relation to eutrophication, heavy metals contamination, marine litter (microplastics) and underwater noise?

16. Do you know of any good monitoring practices in Europe or world-wide in relation to eutrophication, heavy metals contamination, marine litter (microplastics) and underwater noise?

17. What synergies -- between organizations, policies, legal requirements, etc. -- could be established concerning monitoring activities, e.g., ships of opportunity, CFP survey, etc.?

18. How does the MSFD implementation at Regional Seas level influence marine monitoring in Country X? Does it help, or is it a limiting factor?
ANNEX III. ABBREVIATIONS OF THE NAMES OF THE MEMBER STATES

The names of the Member States of the European Union must always be written and abbreviated according to the following rules:

1) the two-letter ISO code should be used (ISO 3166 alpha-2), except for Greece and the United Kingdom, for which the abbreviations EL and UK are recommended;
2) the protocol order of the Member States is based on the alphabetical order of their geographical names in the original language(s) (see also Section 7.1.2, ‘Country listing order’).

<table>
<thead>
<tr>
<th>Short name, source language(s) (geographical name) (1)</th>
<th>Official name, source language(s) (protocol name)</th>
<th>Short name in English (geographical name)</th>
<th>Official name in English (protocol name)</th>
<th>Country code (2)</th>
<th>Former abbreviation (2)</th>
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</thead>
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<td>Belgique/België</td>
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<td>Malta</td>
<td>Repubblika ta’ Malta</td>
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<td>Republic of Malta</td>
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<td>Nederland</td>
<td>Koninkrijk der Nederland</td>
<td>Netherlands</td>
<td>Kingdom of the Netherlands</td>
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<td>NL</td>
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</tbody>
</table>

The COMMON SENSE project has received funding from the European Union’s Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.
The COMMON SENSE project has received funding from the European Union's Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.
# ANNEX IV. OVERVIEW OF CRITERIA USED FOR ASSESSING ADEQUACY PER DESCRIPTOR

<table>
<thead>
<tr>
<th>Descriptor</th>
<th>Definition of Good Environmental Status (art. 9)</th>
<th>Initial Assessment (art. 8)</th>
<th>Environmental targets (art. 10)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Biological diversity</td>
<td>GES is more than a reformulation of the MSFD (i.e. criteria/indicators are defined) GES covers the seven criteria of the Commission Decision (or if GES is defined at indicator level, they provide a more refined definition for each of the criteria) GES addresses at least species, habitats and the ecosystem as a whole Species (highly mobile groups) GES addresses at least birds, mammals, reptiles, fish, and cephalopods (where relevant) GES uses the concept of functional groups or an equivalent classification GES covers all (relevant) species even if some species are singled out (e.g. as indicators) GES addresses special/listed species (of Habitats and Birds Directives and relevant international agreements – e.g. RSC lists) Habitats GES addresses at least water column habitats and the main (relevant) zones for seabed habitats (intertidal, shallow, shelf, bathyal/abyssal) GES uses the concept of predominant habitats or an equivalent classification GES covers all (relevant) habitats even if some</td>
<td>Pressures (physical loss and damage) The analysis covers all relevant types of physical loss/physical damage in the area The analysis covers all main causes (i.e. human activities) of physical loss/physical damage in the area The analysis covers the impacts of physical loss/damage on the relevant aspects of the marine environment (seabed habitats) The judgement on the level of the pressure (i.e. on the current environmental status) is adequate in the light of the information provided Data/knowledge gaps identified and plans to address them are described (what, by when) Biological features The assessment has identified the relevant predominant habitats/functional groups/species for the MS/marine region The assessment covers at least the major zones for seabed and water column (if relevant) The assessment covers at least the five major species groups (if relevant) The assessment covers at least those species and habitats which are covered under the relevant RSCs</td>
<td>The set of environmental targets/indicators addresses all the elements (e.g. criteria/indicators) of the GES definition or at least allows achieving GES for all criteria/indicators. Suitably specific indicators are provided for each target (unless the target is sufficiently specific that it does not need indicators) The set of targets/associated indicators is SMART (Specific; Measurable (with a threshold value or a baseline for trend-based indicators); Achievable; Realistic; Time-bound) Targets and associated indicators are consistent as a set Target sufficiently ambitious to reduce the pressure or impact (or improve status) to levels that will achieve GES Targets do not express what is GES</td>
</tr>
<tr>
<td>Descriptor</td>
<td>Definition of Good Environmental Status (art. 9)</td>
<td>Initial Assessment (art. 8)</td>
<td>Environmental targets (art. 10)</td>
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<tr>
<td>habitats are singled out (e.g. as indicators)</td>
<td>If the MS has used different predominant habitat and functional group types to those pre-defined, the categorisation used is equivalent/appropriate and covers the full range of biodiversity in the MS waters of the (sub-)region</td>
<td></td>
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</tr>
<tr>
<td>GES addresses special/listed habitats (of Habitats and Birds Directives and relevant international agreements – e.g. RSC lists)</td>
<td>The assessment of habitat types address both the abiotic (physical, hydrological, chemical) and biotic (community) aspects of each habitat</td>
<td></td>
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</tr>
<tr>
<td>Ecosystem</td>
<td>The judgement on the features’ status is adequate in light of information provided i.e. it is defined at least in a qualitative manner, using specified criteria and indicators.</td>
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</tr>
<tr>
<td>GES definition covers the whole ecosystem structure.</td>
<td>The main pressures and impacts on the features are identified</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baselines</td>
<td>Where individual species or fine-scale habitats/biotopes are reported as surrogates for the functional groups and predominant habitat types:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The baselines used are in the sense of ‘reference condition’, i.e. in relation to ‘prevailing physiographic, geographic and climatic (natural) conditions’ that are largely free from anthropogenic influences.</td>
<td>• The species/biotopes collectively provide an overall assessment of status of each ‘minimum’ category species group/habitat type</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The choice of the baseline is appropriate considering the knowledge available. A current or past degraded state can be used as a baseline only if the ambition is to improve quality towards a reference state (reference conditions).</td>
<td>• The main pressures and impacts for the species group/habitat type are identified through the individual assessments</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GES is based on the use of the ‘reference condition plus acceptable deviation’ principle for each of the criteria (sensu WFD).</td>
<td>Where individual species are reported as ‘listed’ features:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GES reflects, where appropriate, the definitions for Favourable Conservation Status under the Habitats Directive and for Good Ecological Status under the Water Framework Directive.</td>
<td>• There is an assessment of their status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GES refers to the relevant regional and international agreements (e.g. OSPAR, HELCOM, UNEP/MAP, BSC, ASCOBANS, ACCOBAMS) (Quantitative) threshold values are given for GES</td>
<td>• The main pressures and impacts are identified</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data/knowledge gaps identified and plans to</td>
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<tr>
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</thead>
<tbody>
<tr>
<td>2. Non-indigenous species</td>
<td>GES is sufficiently specific to judge when it has been achieved</td>
<td>The national list of NIS is consistent with the RSC and IAS list of NIS</td>
<td>The environmental target is SMART</td>
</tr>
<tr>
<td></td>
<td>The definition of GES is more than a reformulation of the MSFD Annex I</td>
<td>The analysis and assessment of the pressure from NIS is adequate in the light of available knowledge/ level of information/ established methods to assess this topic</td>
<td>Suitably specific indicators are provided for each target</td>
</tr>
<tr>
<td></td>
<td>GES is defined at descriptor/criteria levels</td>
<td>This includes:</td>
<td>The target is sufficiently ambitious to reduce the pressure or impact to levels that will achieve GES (if possible by 2020)</td>
</tr>
<tr>
<td></td>
<td>GES covers (directly/indirectly) criterion 2.1 / criterion 2.2</td>
<td>• coverage of relevant NIS,</td>
<td>The target(s) and indicators regarding the spread of NIS cover all the main sources of new introductions (e.g. ballast water, ship hulls, aquaculture &amp; Suez Canal)</td>
</tr>
<tr>
<td></td>
<td>The definition of GES meets the minimum requirements ( no new introductions of NIS, and where possible, no further spreading of them)</td>
<td>• identifying knowledge gaps together with plans to address them,</td>
<td>The targets and associated indicators are consistent as a set (i.e. absence of conflict)</td>
</tr>
<tr>
<td></td>
<td>If further development is needed, there is a clear indication of plans (what, by when)</td>
<td>• identification of main vectors/ pathways, preferably with a ranking,</td>
<td>Targets do not express what is GES</td>
</tr>
<tr>
<td></td>
<td>The GES definition is sufficiently precise</td>
<td>• relevant impacts on (seabed/water column) habitats are described (at least qualitative assessment of impacts),</td>
<td></td>
</tr>
<tr>
<td>3. Commercial fish and shellfish</td>
<td>All stocks for which analytical assessments are available will be exploited at or below Fmsy</td>
<td>Stocks are assessed in relation to MSY and/or PA reference points for all relevant (sub)regions</td>
<td>Targets clearly require all stocks (with analytical assessments) to be exploited at or below Fmsy</td>
</tr>
<tr>
<td></td>
<td>Secondary indicator does not have to be used but is adequate when it will be set using a proxy for MSY or is stable and or decreasing</td>
<td>Information has been provided on the fishing fleet</td>
<td>Targets clearly require all stocks (with analytical assessments) to have a SSB that is at or above SSBpa, BMSY-trigger or Bmsy</td>
</tr>
<tr>
<td></td>
<td>Both fish and shellfish stocks in all relevant</td>
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</thead>
<tbody>
<tr>
<td>4. Food webs</td>
<td>All stocks have a SSB which is equal to or above SSBpa, BMSY-trigger or SSBmsy. Secondary indicator does not have to be used but is adequate when it will be set using a proxy of a Pa, MSY or the indicator is stable and/or increasing. Criterion 3.3 has been used in the GES definition (with or without the indicators of the Commission Decision).</td>
<td>(sub)regions are assessed. Judgement on the level of pressure and/or on status of commercial fish and shellfish stocks in relation to GES is provided and adequate in light of the information provided. Data/knowledge gaps are identified and plans to address them are described (what, by when).</td>
<td>Relevant targets at least for the previously mentioned criteria are SMART.</td>
</tr>
<tr>
<td></td>
<td>GES is more than a reformulation of the MSFD Annex I. GES meets the minimum requirements: • uses all the criteria set in the COM Decision or if GES is defined at indicator level, they provide a more refined definition for each of the criteria. • The definition of GES covers all main food web components for the marine (sub-) region/Member State (i.e. components from plankton and benthos through to higher trophic levels). • The species that are selected as indicators of changes in the food web are considered appropriate. The choice of the baseline is appropriate considering the knowledge available. A current or past degraded state can be used as a baseline only if the ambition is to improve quality towards a reference state (reference conditions). The baselines used are in the sense of ‘reference.</td>
<td>As above (descriptor 1)</td>
<td>As above (descriptor 1)</td>
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<tr>
<td></td>
<td>GES has been achieved</td>
<td>Reference is made to WFD (monitoring results, reports, etc.)</td>
<td>As above (descriptor 1)</td>
</tr>
<tr>
<td></td>
<td>Aggregation rules are mentioned</td>
<td>Reference is made to the relevant Regional Sea Convention</td>
<td>As above (descriptor 1)</td>
</tr>
<tr>
<td>6. Sea-floor</td>
<td>GES is more than a reformulation of the MSFD Annex I text. GES meets the minimum requirements:</td>
<td>As above (descriptor 1)</td>
<td></td>
</tr>
<tr>
<td>integrity</td>
<td>• GES uses all the criteria set out in the COM Decision or if GES is defined at indicator level, they provide a more refined definition for each of the criteria.</td>
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<td></td>
<td>• GES covers all relevant biogenic substrates for this marine region/member state</td>
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<td></td>
<td>• GES covers all relevant substrate types, following the typology of predominant habitat types as used for habitats for Descriptor 1.</td>
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<td></td>
<td>The choice of the baseline is appropriate considering the knowledge available. A current or past degraded state can be used as a baseline only if the ambition is to improve quality towards a reference state (reference conditions).</td>
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<tr>
<td></td>
<td>The baselines used are in the sense of ‘reference condition’, i.e. in relation to ‘prevailing physiographic, geographic and climatic (natural) conditions’ that are largely free from anthropogenic influences.</td>
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<td></td>
<td>The determination of GES is based on the use of</td>
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<tr>
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<td></td>
<td>the ‘reference condition plus acceptable deviation’ principle for each of the criteria (sensu WFD). Where a current or past state is used as a baseline and represents a degraded state, there is ambition to improve quality towards a reference state above a GES threshold value.</td>
<td>The assessment covers most pressures and most relevant impacts. The assessment covers the main causes of the pressures. The judgement/trends on the level of the pressure (e.g. in good status) is adequate in light of information provided. The judgement/trends on the impact of the pressure (e.g. in good status) is adequate in light of information provided. Reference is made to WFD reports. Reference is made to the relevant Regional Sea Convention. The assessment covers marine acidification. Data/knowledge gaps are identified and plans to address them are described (what, by when).</td>
<td>The set of targets addresses pressures. The set of targets addresses impacts (in relation to D1, D4 and D6). The set of targets/ associated indicators is SMART. The targets are linked to the appropriate WFD normative definitions of ecological status classifications for coastal waters. Reference is made to other regulatory tools (e.g. EIA, SEA, Habitats Directive) Reference is made to the relevant Regional Sea Convention. The set of targets is considered consistent. Targets do not express GES and are focused on reducing pressures and impacts in order to help achieve GES.</td>
</tr>
<tr>
<td>7. Hydrographical changes</td>
<td>GES is more than a reformulation of the MSFD Annex I. GES meets the minimum requirements: • Criterion 7.1 – spatial characterization • Criterion 7.2 - Impact GES uses the indicators of COM Decision 2010/477: • Indicator 7.1.1 – Extent of area affected • Indicator 7.2.1 – Spatial extent of habitats • Indicator 7.2.2 – Changes in habitats and functions GES is the same or comparable to the appropriate WFD normative definitions of ecological status classifications for coastal waters. There is reference to the relevant Regional Sea Convention Reference is made to other regulatory tools (e.g. EIA, SEA, Habitats Directive) GES provides details about specific threshold values/baselines.</td>
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<tr>
<td>Descriptor</td>
<td>Definition of Good Environmental Status (art. 9)</td>
<td>Initial Assessment (art. 8)</td>
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<tr>
<td>8. Contaminants</td>
<td>GES is sufficiently specific to determine when GES has been achieved</td>
<td>The assessment covers all relevant sources of contaminants (i.e. land-, sea- and air-based)</td>
<td>The set of environmental targets/indicators addresses all the elements (e.g. criteria/indicators) of the GES definition or at least allows achieving GES for all criteria/indicators – for contaminants that means covering at least 8.1 and 8.2 if this is covered in GES definition</td>
</tr>
<tr>
<td></td>
<td>GES is more than a reformulation of the MSFD Annex I</td>
<td>The assessment covers all relevant substances (man-made substances, with specification of which substances are assessed, heavy metals (at least Hg, Cd, Pb), radioactive substances (at least C-137), oil and oil products)</td>
<td>Suitably specific indicators are provided for each target (unless the target is already sufficiently specific)</td>
</tr>
<tr>
<td></td>
<td>GES covers the two criteria: concentration and effects of contaminants</td>
<td>The assessment includes at least quantitative trends (i.e. concentrations of contaminants are decreasing/increasing) and/or input loads of contaminants into the environment</td>
<td>The set of targets/associated indicators is SMART</td>
</tr>
<tr>
<td></td>
<td>The criterion on concentration of contaminant refers to the three relevant matrices (water, biota and sediment)</td>
<td>Frequency and origin of acute pollution events are quantitatively described (i.e. at least number of accidents/incidents over a certain period of time or quantity of oil/oil-products input to the water)</td>
<td>Target are sufficiently targeted towards reducing levels of a specified pressure or impact, or controlling human activities, which are preventing GES from being achieved</td>
</tr>
<tr>
<td></td>
<td>The criterion on concentration of contaminants refers to the EQS Directive, i.e. the standards used are at least those of the EQS Directive in water and for the three substances for which an EQS exist in biota (Hg, HCB and HCBD) OR Reference is made to make use of Article 3 of the proposal 2011/0429 (COD) for a Directive amending Directives 2000/60/EC and 2008/105/EC ‘establish a method that offers at least the same level of protection as the EQS provided for in that annex’</td>
<td>The assessment covers all relevant impacts of contaminants (at least on seabed habitats and on functional groups – on functional groups, referring to at least one specific biological effect – e.g. imposex)</td>
<td>Targets are sufficiently ambitious to reduce the pressure or impact to levels that will achieve GES (if possible by 2020)</td>
</tr>
<tr>
<td></td>
<td>If EQS are not used, the justification for using other relevant standards (e.g. the OSPAR EACs) is provided and sufficient</td>
<td>A judgement is made using relevant standards (e.g. EQS) at a relatively aggregated level (i.e. for levels of concentrations in the environment (not by substances) and for impacts on seabed habitats/functional groups.</td>
<td>Targets and associated indicators defined for Descriptor 8 are consistent as a set</td>
</tr>
<tr>
<td></td>
<td>The substances covered by the GES definition are specified OR a specific reference to a defined standard makes it understandable which substances are covered.</td>
<td>Data/knowledge gaps are identified and plans to</td>
<td>Targets do not express what is GES</td>
</tr>
</tbody>
</table>
| | Aggregation rules are provided or the “all in, all out” rule applies. | }
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td><strong>9. Contaminants in seafood</strong></td>
<td>The criterion on effects of contaminants refers to specific biological effects on ecosystem components (e.g. imposex) or at least to internationally-recognized guidelines for the monitoring of such biological effects (e.g. OSPAR JAMP/ICES). If reference is not made to an internationally-recognized standard, parameters and baselines should be specified for GES to be measurable. The criterion on effects of contaminants addresses acute pollution events from both an effect perspective (e.g. effect of oil and oil products on birds) and from a pressure perspective (frequency/origins of acute pollution events). For the frequency/occurrence of events, the GES is at least trend-based (i.e. number of events should be reducing) and a baseline is defined.</td>
<td>The assessment covers all relevant sources of contaminants (i.e. land-, sea- and air-based) and is at least trend-based (i.e. number of events should be reducing) and a baseline is defined.</td>
<td>The set of environmental targets/indicators is sufficiently specific to enable its measurement, and assessment of progress towards achieving the target. The set should be assessed together and is SMART. The set of environmental targets/indicators addresses all the elements (e.g. criteria/indicators) of the GES definition.</td>
</tr>
<tr>
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</tr>
<tr>
<td>fish/shellfish</td>
<td>No particular minimum requirement with regard to indicator 9.1.2 on frequency of regulatory levels. The GES definition does not cover aquaculture products. The definition of GES and/or accompanying text make it clear that the GES applies to seafood coming from the relevant (sub)regions.</td>
<td>The assessment includes at least quantitative trends (i.e. concentrations of contaminants in fish and seafood are decreasing/increasing) and/or actual concentrations are provided. A judgement is made using relevant standards (i.e. EU foodstuff limits / possible alternative: OSPAR EAC in fish and mussels) at a relatively aggregated level. Data/knowledge gaps are identified and plans to address them are described (what, by when).</td>
<td>That it does not need indicators. Targets are sufficiently targeted towards reducing levels of a specified pressure or impact, or controlling human activities, which are preventing GES from being achieved. Targets are sufficiently ambitious to reduce the pressure or impact to levels that will achieve GES (if possible by 2020) – this may be directly (i.e. through pressure targets) or indirectly (i.e. through impacts/state targets which imply that pressures should be reduced in order to be achieved). Targets and associated indicators defined for Descriptor 9 consistent as a set.</td>
</tr>
<tr>
<td>10. Marine litter</td>
<td>The definition of GES is not a copy or simple reformulation of the MSFD Annex I. The GES definition uses the same criteria/indicators as those set in COM Decision 2010/477. If the GES definition uses other criteria/indicators, they are equivalent to those of the COM Decision or cover additional relevant elements. The definition of GES and/or the accompanying text provides details about specific types of litter/threshold values/baselines. This additional information is relevant considering availability of knowledge/established methods.</td>
<td>The assessment covers all relevant types. The assessment covers all relevant forms of litter. The assessment covers the sources of marine litter. The assessment covers all the relevant habitats (at least seabed and water column). The assessment covers the impacts of marine litter on marine life. The assessment covers all relevant geographical areas. When provided, the judgement on the level of, and impact from, the pressure (e.g. in good status) is adequate in light of information provided. Data/knowledge gaps are identified and plans to address them are described (what, by when).</td>
<td>The set of environmental targets/indicators is sufficiently specific to enable its measurement, and assessment of progress towards achieving the target. The set of targets and associated indicators should be assessed together and is SMART. The set of environmental targets/indicators addresses all the elements (e.g. criteria/indicators) of the GES definition or at least allows to achieve GES for all criteria/indicators. Specific indicators provided for each target (unless the target is sufficiently specific that it does not need indicators).</td>
</tr>
<tr>
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<td>Targets are sufficiently targeted towards reducing levels of a specified pressure or impact,</td>
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**COMMON SENSE Deliverable number D.1.2**

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<tr>
<td>11. Energy, including underwater noise</td>
<td>The definition of GES is sufficiently detailed/specific to enable its assessment in the different matrices (shore, water column/surface, seabed)</td>
<td>The assessment covers both types of sound (criterion 11.1 and 11.2)</td>
<td>The targets cover pressures or impacts or address monitoring</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The assessment covers the main causes of pressure</td>
<td>The set of targets/associated indicators is SMART</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The assessment covers most relevant impacts</td>
<td>The set of targets is considered consistent</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The judgement/trends on the level of the pressure (e.g. in good status) is adequate in light of information provided</td>
<td>Targets do not express what is GES</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The judgement/trends on the impact of the pressure (e.g. in good status) is adequate in light of information provided</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Data/knowledge gaps are identified and plans to address them are described (what, by when)</td>
<td></td>
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</table>

The determination of GES is not a copy or simple reformulation of the MSFD Annex I. The determination of GES addresses both Decision criteria. The GES determination uses the indicators of COM Decision 2010/477. The GES determination is sufficiently specific to determine when GES has been achieved.
ANNEX V. SUMMARY FINDINGS AND RECOMMENDATIONS FOR MEMBER STATES

This Appendix gives a summary per Member State of the findings in the country specific reports, made by the contractor on basis of the questionnaire per descriptor and the general questionnaire. It describes some general features, highlights per article strong and weak points, it addresses identified gaps in knowledge and information and plans to address them and concludes with recommendations.

Belgium

General issues

Marine waters

Belgium is part of the North East Atlantic; the outer limit of the coverage is defined by the international boundaries of the Belgian Continental Shelf. The area covers 0,5% of the North Sea and borders the waters of three neighbouring countries.

Areas assessed

The assessment area is the Belgian marine waters as a whole. No specific further sub-division of assessment areas has been defined. There is no indication on aggregation rules.

Regional Cooperation

Belgium is a party to OSPAR; efforts for regional and bilateral coordination are extensively described. Belgium has used the OSPAR 2010 Quality Status Report as a reference in its assessment report. Belgium underlines that the timelines and ambitious requirements of the MSFD prevented the coordination on GES and setting of targets.

Other features

Belgium has used the water account approach for its economic and social analysis. The cost of degradation is based on an analysis of current expenditure for environmental protection measures, abatement and transaction costs as well as opportunity costs. The socio-economic analysis did not result in a clear outcome for the assessment of degradation and restoration costs.

Determination of Good Environmental Status (Art. 9)

Strong points

All the descriptors under the MSFD are covered. Relevant international or EU legislation and OSPAR decisions have been acknowledged. GES is not a mere reproduction of the directive’s definition and often refers to EU and regional standards and requirements.

Weak points

GES is for most of the descriptors defined at descriptor and (partly) criterion level, but not at indicator level. Only for descriptor 3 are definitions at indicator level included. However, for its definition at
criteria level, Belgium has chosen to combine or group different elements which relate to several criteria and/or indicators which makes it difficult to assess if all elements are addressed.

For descriptor 5 GES is only defined at descriptor level and for descriptor 2 at descriptor level, close to the definition of MSFD Annex 1 and one criterion. Also GES definitions on criteria lack specification which make it difficult to assess achievement of GES.

**Overall score**

GES definitions for descriptor 10 is considered inadequate because definitions relate mainly to the descriptor level and do not allow an assessment for GES.

GES definitions for the other descriptors are considered to be partially adequate. Given definitions are mostly clear but lack specific detail in relation to baseline references that would allow proper GES assessments or lack alignment with the GES Commission Decision or OSPAR common procedure.

**INITIAL ASSESSMENT (ART. 8)**

**Strong points**

The assessment for most of the descriptors is based on an appropriate range of parameters and covers relevant geographical areas.

**Weak points**

For some descriptors not all relevant pressures and related impacts are described and assessed in a similar manner. Impacts are only partially assessed and for one descriptor (Descriptor 9) no clear assessment has been undertaken at all. The information provided lacks in many cases adequate quantitative detail and information on pressures is not always reflected in the assessment of biological features itself. No or little indication is given on how identified knowledge gaps for appropriate assessment will be filled.

**Overall score**

The assessment is considered adequate for marine litter (Descriptor 10). The initial assessment is considered inadequate for descriptor 9 (very limited assessment and inconsistent/contradictory between reporting sheet and paper report) and descriptor 11 (for which only possible sources are listed). For the other descriptors the assessment is considered partially adequate as an assessment of the impacts is partly missing or missing.

**ENVIRONMENTAL TARGETS (ART. 10)**

**Strong points**

Several targets, particularly the ones relating to biodiversity, descriptors 7 and 8 are SMART and well-focused on relevant pressures.

**Weak points**

The biodiversity targets do not cover all criteria. The target for descriptor 2 (no new NIS) is not considered SMART and does not cover main pathways. Targets for descriptor 3 are not consistent. Targets for descriptor 5 do not address all criteria. For descriptor 9, not all relevant aspects of the
Commission Decision are considered. For Descriptor 10, targets seem more to relate to impacts than pressures despite the statement on the reduction of the amount of litter in the GES definition.

**Overall score**

Targets are considered adequate for the biodiversity descriptors (Descriptor 1, 6) and for descriptors 7 and 8.
They are considered partially adequate for descriptors 4, 5 (not all criteria used), 9 (a copy of GES), 10 (no threshold defined) and 11 (unclear how this would be applied in a wider area).
Targets are considered inadequate for descriptors 2 and 3 since they are not SMART or consistent.

**Consistency**

The approach used by Belgium for defining GES and setting targets for all descriptors is overall consistent. Not all impacts are addressed in the initial assessment and in addition, for the biological descriptors, the use of combined criteria makes a direct link between GES and targets with the initial assessment difficult.

**Identified gaps and plans to address them**

In its initial assessment, Belgium provides very little detail about knowledge gaps (in both the reporting sheets and the paper report) or about future plans to address any gaps.
In the introduction to its report on GES and targets, Belgium acknowledges that the determination of GES and the setting of targets for this first reporting cycle have relied mainly on existing assessments and methodologies and that gaps identified during this first reporting cycle will be addressed in the next reporting cycles. No specifications are given on how exactly these gaps will be addressed.

**Recommendations**

Belgium should:

i. Strengthen and coordinate methodology for the socio-economic analysis allowing assessment of the degradation/restoration costs and MSFD implementation costs/benefit analysis;
ii. Improve GES definitions including through regional cooperation using the work of the Regional Seas Convention as much as possible, focusing on quantitative aspects and baselines, with the aim to make GES measurable, focusing especially on those descriptors assessed as inadequate or partially adequate;
iii. Identify knowledge and information gaps and address these, i.a. through the monitoring programme under the MSFD and research programmes, focusing on those descriptors considered as inadequate or partially adequate;
iv. Further develop its approaches to assessing (quantifying) impacts from the main pressures to lead to improved and more conclusive assessment results in 2018;
v. Ensure that the targets cover all relevant pressures, are SMART and sufficiently ambitious to achieve the requirements and timelines of the MSFD.
**Bulgaria**

**General issues**

Bulgaria reported very late which allowed the Commission services only to assess the Bulgarian implementation of Article 9 and 10. The evaluation of Bulgaria's implementation of Article 8 will be completed at a later stage.

**Marine waters**

The scope of the Bulgarian marine waters covers the exclusive economic zone (EEZ) of the Republic of Bulgaria, the territorial sea and the shallow coastal waters, up to the outer limit of transitional waters.

**Areas assessed**

Bulgaria has defined the following formal assessment areas for the pelagic zone: coastal (0-30 m below sea level, BSL), shelf (30-200 m BSL) and open sea (>200 m BSL), based on satellite-derived chlorophyll-a concentrations and review of the existing data/literature, showing correspondence with the previous zonation based on anthropogenic pressure, sea currents, productivity and bathymetry. The benthic zone is divided into 10 assessment areas based on the substrate characteristics and associated communities.

**Regional cooperation**

Bulgaria reports that bilateral cooperation has taken place with Romania, Turkey and other Black Sea countries through bilateral agreements and policy initiatives, using the mechanisms of the Bucharest Convention. It also mentions the inconsistencies between Bulgaria and Romania in the methodological approaches for assessing the ecological status of the Black Sea waters and insufficient cooperation with Turkey. Bulgaria underlines the regional dimension of the marine/coastal environment challenges and often refers to Bucharest Convention documents when defining GES and targets.

**Other features**

Bulgaria reported very late which is why its initial assessment including the socio-economic analysis could not be taken into account. It invokes MSFD Article 14(1)(b) (exceptions for natural causes) to exclude the deep sea slope and abyssal plain from GES determination because of anaerobic conditions and presence of toxic hydrogen sulphide gas at a depth of 150-200m.

**Determination of Good Environmental Status (Art. 9)**

**Strong points**

The division of Bulgaria’s marine waters into three groups should enable greater precision in defining environmental status. However, it will need to be aligned with the definition of the WFD coastal waters to ensure consistency. There is a partially good GES definition for Descriptors 1, 3, 5 and 7.

**Weak points**

Bulgaria has not defined GES for Descriptors 4, 9, 10 and 11.
There is a lack of clarity in the distinction between GES and targets (e.g. for Descriptor 2, 9). There is a low level of precision and ambition for Descriptor 8; it is doubtful whether all available data (referred to in the assessment) has been used.

**Overall score**

Partially adequate are Descriptors 1, 2, 3, 5 and 7 but inadequate or absent GES definitions for the other descriptors.

**INITIAL ASSESSMENT (ART. 8)**

The initial assessment by Bulgaria has not been assessed due to late reporting.

A fairly detailed socio-economic analysis of the marine water uses is provided, but it suffers from an information deficit on key economic indicators and environmental impact.

**ENVIRONMENTAL TARGETS (ART. 10)**

**Strong points**

Bulgaria defines assessment areas and attribution of specific threshold values for each assessment area for certain descriptors (e.g. Descriptor 5).

It has made effort to define specific and quantified targets for Descriptors 1, 3, 5 and 6.

It has more than 70 targets and three to four times more indicators to cover Descriptors 1 and 6. The targets and indicators are very specific and defined with quantitative threshold values.

**Weak points**

Targets are not defined for Descriptors 4, 10 and 11.

There is a surprisingly low level of precision and ambition for Descriptor 8.

**Overall score**

Descriptors 1 and 5 are adequate and descriptors Descriptors 3 and 6 are partially adequate. Targets for the other descriptors are inadequate or missing.

**CONSISTENCY**

It is sometimes difficult to judge consistency due to differences between the reporting sheets and the paper report, resulting in uncertainty as to what exactly should be considered as GES or what is set as environmental target; consistency cannot be evaluated for the several descriptors for which GES or targets are missing.

**IDENTIFIED GAPS AND PLANS TO ADDRESS THEM**

Data and knowledge gaps are highlighted throughout the report on Articles 9 and 10 for each descriptor. For certain descriptors for which data and knowledge gaps are very important (e.g. Descriptor 11), Bulgaria provides a number of high-level recommendations and plans to address these gaps. However it does not provide a timeline and specific steps to implement these recommendations.

**RECOMMENDATIONS**

Bulgaria should:
i. Strengthen the GES definition of the biodiversity descriptors which goes beyond what is in existing legislation;

ii. Improve GES definitions including through regional cooperation using the work of the Regional Seas Convention as much as possible focusing on quantitative aspects and baselines, with the aim to make GES measurable, focusing especially on those descriptors assessed as inadequate or partially adequate;

iii. Address knowledge gaps identified in the initial assessment, i.a. through the monitoring programme under the MSFD and research programmes, focusing on those descriptors considered as inadequate or partially adequate;

iv. Ensure that the targets cover all relevant pressures, are SMART and sufficiently ambitious in order to achieve the requirements and timelines of the MSFD;

v. Improve the consistency between the criteria used in GES, the assessment of the impact and the proposed targets.

Additional recommendations may be resulting from the assessment of Bulgaria’s article 8 implementation, once completed.

Cyprus

General issues

Marine waters

Cyprus’ marine waters are part of the Aegean-Levantine Sea marine subregion. No formal subdivisions have been made. The spatial delineation of Cyprus’ marine waters is clearly identified, with maps showing the different marine areas and habitats of the general marine area, and further by a map showing the bathymetry and limits of the EEZ of Cyprus.

Areas assessed

Cyprus’ initial assessment, characteristics of GES and associated targets and indicators have been developed for marine waters of Cyprus as a whole.

Regional cooperation

Cyprus is contracting party to the Barcelona Convention. In addition, Cyprus mentioned the Memorandum of Understanding on Environmental Protection and Sustainable Development signed on 29 September 2010 with the Ministry of Environment, Energy and Climate Change of Greece. The Memorandum includes a provision on the implementation of the MSFD. No coordination efforts have been reported.

Other features

The economic and social analysis of marine uses for Cyprus has been carried out using the water account approach, whereas a cost-based approach has been followed to evaluate the cost of degradation.
**DETERMINATION OF GOOD ENVIRONMENTAL STATUS (ART. 9)**

**Strong points**

Cyprus set GES for nearly all descriptors.

**Weak points**

GES is defined only at the descriptor level and generally merely reproduces the definitions set in Annex I of the Directive. No GES definition was provided for Descriptor 4.

There is no systematic use of the 2010 Commission Decision criteria and indicators when setting GES and there is a lack of clarity in what constitutes GES and what are the environmental targets and associated indicators.

In the reporting sheets and the paper report there is confusion between GES definition, initial assessment and environmental targets and indicators.

**Overall score**

Three GES definitions are considered as partially adequate (Descriptors 3, 7 and 9) since they were not completely clear.

The remaining descriptors (Descriptors 1, 2, 5, 6, 8, 10 and 11) are assessed as inadequate since the determination of GES is a reproduction of MSFD Annex I and does not meet the minimum requirements.

No GES definition was provided for Descriptor 4.

**INITIAL ASSESSMENT (ART. 8)**

**Strong points**

Cyprus attempts to quantify many elements of the initial assessment and uses expert judgement to draw conclusions to complement existing data. Cyprus has made a judgement on the status of the marine environment in relation to GES for Descriptors 2, 3, 5, 7, 8, 9. In order to make this judgement, Cyprus has defined specific ‘weighted indicators’ on the basis of the criteria and indicators of the Commission Decision, but the methodology used to calculate the status based on these indicators is not clear.

For the initial assessment, data and reports from UNEP-MAP\(^{353}\) were used in relation to biodiversity.

**Weak points**

The initial assessment is mainly descriptive and impacts from pressures are rarely reported on.

**Overall score**

Two initial assessments for some pressures/impacts are considered as adequate (Descriptors 5 and 6) thanks to a qualitative and quantitative judgment made in relation to GES on trends and the provision of information on knowledge gaps and plans to address them.

Five initial assessments for other pressures/impacts are considered as partially adequate (Descriptors 1, 2, 3, 4 and 8) mainly due to incompleteness, no clear judgments (on pressures and impacts) and lack of

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\(^{353}\) The United Nation Environment Programme, Mediterranean Action Programme hosts the secretariat for the Barcelona Convention.

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information on knowledge gaps and plans to address them. Also the assessment of microbial pathogen contamination is partially adequate. The remaining four initial assessments (for Descriptors 7, 9, 10 and 11) are considered as inadequate mainly due to provision of limited information and their incompleteness.

**ENVIRONMENTAL TARGETS (ART. 10)**

**Strong points**

Cyprus sets what it calls ‘quantitative targets’ (for Descriptors 1, 5, 6, 8 and 9) which are calculated on the basis of a set of so-called ‘indicators’, which are linked to some of the criteria and indicators of the Commission Decision.

**Weak points**

Cyprus has set environmental targets (state-based targets) only for a limited number of descriptors, namely Descriptors 1, 3, 5, 6, 8 and 9. Environmental targets are defined in a vague and general way, often phrased as a GES definition. The associated ‘indicators’ are the same as those used for making a judgement on the current status in relation to GES. The methodologies to assess current status and set quantitative targets are not clearly explained in the reported documents e.g. there is a lack of specification of what reference conditions are.

**Overall score**

Cyprus has not set targets for Descriptors 2, 4, 7, 10 and 11 due to lack of sufficient data. Targets related to Descriptor 5 are partially adequate since they are specific and measurable, but it is not clear if they are achievable and realistic. The targets of all the remaining descriptors (Descriptors 1, 3, 6, 8 and 9) are considered inadequate, mainly due to the fact that they are a reproduction of the GES definition.

**CONSISTENCY**

There is a lack of consistency in the approach undertaken to set GES and environmental targets across the different descriptors. In addition, these differences in approaches and formats make it very difficult to identify the exact definition of GES.

**IDENTIFIED GAPS AND PLANS TO ADDRESS THEM**

Data and knowledge gaps are generally identified and described; for five descriptors environmental targets have not been set due to the lack of data. Cyprus often describes necessary research and/or monitoring activities in broad terms without further specifications as to when, how and by whom they will be addressed.

**RECOMMENDATIONS**

Cyprus should:

i. Strengthen the GES definition of the biodiversity descriptors which goes beyond what is in existing legislation;

ii. Improve GES definitions including through regional cooperation using the work of the Regional Seas Convention as much as possible focusing on quantitative aspects and baselines, with the
aim to make GES measurable, focusing especially on those descriptors assessed as inadequate or partially adequate;

iii. Address knowledge gaps identified in the initial assessment, i.a. through the monitoring programme under the MSFD and research programmes, focusing on those descriptors considered as inadequate or partially adequate;

iv. Further develop its approaches to assessing (quantifying) impacts from the main pressures to lead to improved and more conclusive assessment results for 2018;

v. Ensure that the targets cover all relevant pressures, are SMART and sufficiently ambitious in order to achieve the requirements and timelines of the MSFD;

vi. Improve the consistency between the criteria used in GES, the assessment of the impact and the proposed targets.

**Denmark**

**GENERAL ISSUES**

**Marine waters**

The Danish marine waters cover two marine regions, the North East Atlantic and the Baltic Sea. Denmark clearly defines the extent of its marine waters and often informally differentiates three areas: the North Sea and Skagerrak, the Kattegat and the Baltic Sea.

**Areas assessed**

Denmark's assessment under Articles 8, 9 and 10 has been developed for the Danish waters as a whole, though in the initial assessment, information is provided for each of the individual subregions, as Denmark often informally differentiates three areas: the North Sea and Skagerrak, the Kattegat and the Baltic Sea.

**Regional cooperation**

Denmark is part of both OSPAR, in the North East Atlantic region, and HELCOM, in the Baltic Sea. Denmark notes it has not had the opportunity to make full use of regional cooperation in this reporting cycle due to timing differences between the implementation of the different Contracting Parties, though progress is expected to continue until 2018.

**Other features**

Denmark has undertaken an extensive economic and social analysis using the water accounts approach, and the DPSIR\(^{354}\) approach in a comprehensive manner, presenting results of impacts on the economy, employment and environment.

Some inconsistencies have been spotted between the reporting sheet and the paper report submitted by Denmark, when this was the case, this analysis has been made on the basis of the paper report, as stipulated by Denmark.

\(^{354}\) Driving forces, pressures, state, impacts and response.
DETERMINATION OF GOOD ENVIRONMENTAL STATUS (ART. 9)

Strong points

The approach by Denmark is overall consistent in setting Good Environmental Status (GES) also across the two regions covered by Denmark’s marine waters.

Weak points

GES is generally defined in a qualitative manner, avoiding reference to specific baselines, reference states or thresholds, which will make it impossible to assess if GES has been met or not. Apart from descriptors on biodiversity, underwater noise and eutrophication, GES is set at descriptor level only. In addition, insufficient reference is made to standards in existing EU legislation or in the relevant Regional Sea Conventions (with the exception of descriptor 5 on eutrophication, which usefully refers to the Water Framework Directive, WFD). The GES definition of Descriptor 1, for example, appears very restrictive in its scope, gives no precise definition of qualitative terms used and makes little reference to existing baselines, within the WFD, the Habitats Directive or the Birds Directive.

Overall score

Overall, the approach used by Denmark to define GES is inadequate, especially due to the qualitative and imprecise description of GES, which will make it impossible to assess whether or not GES has been met. Descriptors 1 and 4 are partially adequate since the definition of GES addresses most of the indicators of the Commission Decision, but stays rather general with no specification of terms used, such as “maintained” and “safeguard”. Descriptor 10 is also partially adequate. It does not address the criteria of the Decision but it adds additional elements (socio-economic impact and invasive species).

INITIAL ASSESSMENT (ART. 8)

Strong points

The analysis of ongoing pressures on the environment is often clear and detailed (such as for the biodiversity descriptors), and the initial assessment on contaminants makes reference to existing standards both in EU (WFD Environmental Quality Standards for instance) and in Regional Sea Conventions (RSC).

Weak points

Similarly to the approach used to define GES, the initial assessment for Denmark is often too limited in its scope, and provided in a low level of detail, with the exception of the descriptor 5 on eutrophication, which includes both qualitative and quantitative information, covering all relevant sources of nutrients, and using WFD threshold values. In particular, Descriptor 7 on hydrographical conditions is covered by very little information and makes no reference to the existing knowledge, such as for instance under OSPAR and HELCOM. This is also the case for Descriptor 10 on marine litter.
Overall score
The initial assessment is adequate for Descriptors 5, 6 and 8. It is inadequate for Descriptors 7 and 11 because the description is very sparse and there is no specific data. The other descriptors are partially adequate because of their low level of detail.

ENVIRONMENTAL TARGETS (ART. 10)

Strong points
The targets set for biodiversity-related indicators are overall SMART, with clear associated indicators.

Weak points
The targets set by Denmark, on the basis of their initial assessment and in order to reach GES often lack a timeframe and information on threshold values and baselines. As a result, they are often not operational, making it impossible to assess whether GES will be achievable through these targets. In addition, the set of targets does not always cover all relevant aspects of the marine features of the Danish waters (on biodiversity for example), or their scope is too limited (for instance, the targets on foodwebs do not reflect the health of the foodweb as a whole). For descriptor 5 on eutrophication the targets are precise and quantified but not time bound, leaving it open when GES will be achieved. No environmental targets have been set to address hydrological changes, without justification provided. In terms of consistency, the GES, the initial assessment and the targets are not always complementary, and the choice for the allocation of targets to specific descriptors is not always clear. For marine litter for example, the GES definition makes a reference to the propagation of non-indigenous species (NIS), but no target is associated to this aspect of the GES.

Overall score
Overall, the targets set are partially adequate (for Descriptors 1, 4, 6, 5, 8, 9, 11) because they miss threshold values (Descriptor 1) or timing (Descriptor 5) or proper reference to EU legislation (Descriptor 8, 9) or certain aspects of the descriptor (Descriptors 4, 5, 11). The targets for Descriptors 2, 3 and 10 are inadequate as they are vague and not SMART.

CONSISTENCY
The approach followed by Denmark is overall consistent in terms of the approach used for the setting of GES across the two regions. For Descriptor 4 there is inconsistency between the dominant targets for top predators and the definition of GES. For Descriptor 9 the initial assessment is limited compared to the defined targets. For Descriptor 10, GES also refers to socio-economic aspects and NIS which are not reflected in the targets. Finally, GES for Descriptor 11 is generic and is not linked to all targets.

IDENTIFIED GAPS AND PLANS TO ADDRESS THEM
Denmark often does not mention knowledge gaps, and when it does, does not set out detailed plans to address them, for instance referring to further work in RSCs but without further specifications as to when, how and whom.

RECOMMENDATIONS
Denmark should
i. Improve GES definitions including through regional cooperation using the work of the Regional Seas Convention as much as possible focusing on quantitative aspects and baselines, with the aim to make GES measurable, focusing especially on those descriptors assessed as inadequate or partially adequate;

ii. Address knowledge gaps identified in the initial assessment, i.a. through the monitoring programme under the MSFD and research programmes, focusing on those descriptors considered as inadequate or partially adequate;

iii. Improve the consistency between the criteria used in GES, the assessment of the impact and the proposed targets.

**Estonia**

**GENERAL ISSUES**

**Marine waters**

Estonia’s marine waters are located in the north-east of the Baltic Sea and are divided into three areas: the internal sea (between the shoreline and baseline of the territorial sea), the territorial sea (adjacent to the internal sea and extending from the baseline out to 12 nautical miles) and the Exclusive Economic Zone which accounts for almost 1/3 of the whole of Estonia’s marine area.

**Areas assessed**

The assessment area is Estonian marine waters as a whole, with no specific assessment areas defined for MSFD in the way they are mentioned as having been done for Water Framework Directive (WFD).

**Regional cooperation**

Estonia is part of HELCOM but regional co-operation *per se* is not described in the paper report and the reporting sheet only mentions that written and oral communication in the form of meetings and telephone calls have taken place at the regional level.

**Other features**

Estonia has reported on its socio-economic analysis which assesses the multiple uses made of marine waters and includes an analysis of the costs of degradation, focusing on eutrophication, hazardous substances and invasive species. Estonia refers to the DPSIR\(^{355}\) method and to the approach outlined in the guidance document developed by the EU Common Implementation Strategy.

The status of the paper report on “The indicators of good environmental status and the environmental targets of Estonian Marine waters” is uncertain as it has been developed by the Estonian Marine Institute as a proposal for the implementation of MSFD Articles 9 and 10 and does not appear to be a final version endorsed by the authorities.

Determination of Good Environmental Status (Art. 9)

\(^{355}\) Driving forces, pressures, state, impacts and response.

The COMMON SENSE project has received funding from the European Union’s Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.
Strong points

All the MSFD descriptors are covered. Regular reference is made to EU legislation, especially the Habitats Directive, to HELCOM for the development of its indicators and to ICES. The indicators for the condition of benthic communities in Descriptor 6 have clear thresholds and are, therefore, measurable.

Weak points

For Descriptor 1, GES definitions are provided for all criteria and most are quantified through threshold values but they are focused on only a few key species and habitats. The indicators provided for Descriptor 4 do not match directly with those of the Commission Decision and the baselines are only mainly described in a general manner.

The Descriptor 3 GES indicator does not require stocks of commercial fish and shellfish to be within safe biological limits. The scope of Descriptor 7 is very limited (only on changes in temperature and salinity).

GES for Descriptors 10 and 11 is not defined.

Overall score

The GES definitions are partially adequate for Descriptors 1, 2, 5, 6, 8 and 9, but there are caveats relating to the coverage of habitats and species, the relationship with the Commission Decision and queries over the meaning of terms such as “significantly higher” where no context is provided. GES for several descriptors (Descriptors 3, 4) is considered to be inadequate. Descriptors 10 and 11 have not been defined.

INITIAL ASSESSMENT (ART. 8)

Strong points

Reference is made to HELCOM reports and WFD in relation to eutrophication (Descriptor 5), with trends identified and judgements made: the assessment covers all relevant nutrients and organic matter, although in generalised terms. Descriptor 2 has targeted information for each of the indicators, along with a documented judgement on the current status in relation to GES and the methodology to determine that status. The assessment for Descriptors 8 and 9 is concise and semi-quantitative.

Weak points

Much more information is needed on pressures concerning eutrophication, physical loss and physical damage and some key impacts including from nutrient enrichment, marine litter and in relation to stocks of commercial fish and shellfish. Data is acknowledged as being limited. Where information is available, the assessment is on a generic, high level and has generally not been combined to determine the actual status of features. Much of the information on Descriptor 11 refers to the whole Baltic Sea area rather than specifically to Estonian waters.

Overall score

The Initial Assessment for Descriptor 9 is considered adequate because it uses the HELCOM framework to make an extensive assessment of contamination by hazardous substances in fish for human consumption against regulatory levels.
All other descriptors are partially adequate (Descriptors 1, 2, 4, 8, 11) or inadequate (Descriptors 3, 6, 7, 10) due to very limited information describing situations, rather than analysing them, and no assessment of impacts in some cases.

**Environmental Targets (Art. 10)**

**Strong points**

Estonia has set targets for all descriptors.

**Weak points**

Targets across the descriptors read as expressions of GES rather than specific targets to be met. They have not generally been used as a tool to help deliver GES and even where they have there is doubt that the targets and indicators will be sufficient to achieve or maintain GES by 2020.

**Overall score**

All assessments of environmental targets, with the exception of those for Descriptor 4 and 5, are viewed as inadequate because they are expressions of GES rather than specific targets.

**Consistency**

For each descriptor, Estonia has provided a methodology to determine the indicators of Good Environmental Status and the assessment methods to determine whether GES is achieved or not. However, the submissions consistently identify targets that read as if they are GES definitions rather than the indications of what needs to be done to reach GES. The indicators associated with the targets also correspond to Commission Decision criteria instead of relating to the targets themselves. Whilst this is another way to achieve a consistent approach, it will not deliver GES across the range of subjects.

**Identified Gaps and Plans to Address Them**

Data and knowledge gaps are mentioned in an ad-hoc manner in the paper report on the initial assessment. Information gaps are not discussed in a synthetic manner. There are no plans presented about how such data gaps will be addressed.

**Recommendations**

Estonia should:

i. Strengthen the GES definition of the biodiversity descriptors which goes beyond what is in existing legislation;

ii. Improve GES definitions including through regional cooperation using the work of the Regional Seas Convention as much as possible focusing on quantitative aspects and baselines, with the aim to make GES measurable, focusing especially on those descriptors assessed as inadequate or partially adequate;

iii. Identify knowledge and information gaps and address these, i.a. through the monitoring programme under the MSFD and research programmes, focusing on those descriptors considered as inadequate or partially adequate;

iv. Further develop its approaches to assessing (quantifying) impacts from the main pressures to lead to improved and more conclusive assessment results for 2018;
v. Ensure that the targets cover all relevant pressures, are SMART and sufficiently ambitious in order to achieve the requirements and timelines of the MSFD;

**Finland**

**GENERAL ISSUES**

**Marine waters**

Finland's marine waters fall within the Baltic Sea region. Their marine waters include coastal waters, as defined under the Water Framework Directive, territorial waters and an EEZ out to the median line with neighbouring states.

**Areas assessed**

For the purposes of reporting on MSFD Articles 9 and 10, Finland has defined GES and targets for its marine waters as a whole. For MSFD Article 8, Finland has used eight assessment areas which appear to equate to those used for the HELCOM regional assessments.

**Regional cooperation**

Finland is party to the Helsinki Convention (HELCOM). Efforts on regional cooperation within the Convention are not well described. However Finland refers to the HELCOM roof report and indicates that time constraints were a problem in achieving regional coordination.

**Other features**

Finland has used the Water Accounts approach for its economic and social assessment and the cost-based approach to estimate the costs of degradation.

**DETERMINATION OF GOOD ENVIRONMENTAL STATUS (ART. 9)**

**Strong points**

Finland addresses GES for all descriptors and most criteria. It has generally used existing EU requirements and standards and places a strong emphasis on standards and assessments developed in the region (HELCOM).

For Descriptor 1, GES is defined in relation to achieving natural conditions for a number of species and habitat attributes (e.g. distribution, reproductive capacity). GES for Descriptors 2, 6 and 8 seek to have no harmful impacts on ecosystems and their component species and habitats.

For Descriptor 10, issues concerning socio-economic impact, entry of new litter and associated chemical contamination are included. For Descriptor 11, other forms of energy (in addition to noise) are included.

**Weak points**

The GES definition is generally qualitative and therefore not yet defined in a way which is measurable. Further, these normative definitions use terms which lack clarity of meaning, potentially adding to the difficulties of assessing whether GES is being achieved.

**Overall score**

The GES definition for Descriptor 3 is assessed as adequate.
The GES definitions for Descriptors 1, 4, 5, 6, 9 and 10 are assessed as partially adequate, as they either do not fully address the Decision criteria or they lack key elements or specificity. The GES definitions for Descriptor 2, 7, 8 and 11 are assessed as inadequate, as they do not cover all criteria or define its terms or baseline or refer to relevant EU standards or are not specific enough to be measurable.

INITIAL ASSESSMENT (Art. 8)

Strong points
The initial assessment generally identifies well the main pressures on the marine environment and their sources (e.g. for physical damage). There is use of relevant Habitats Directive, Water Framework Directive (WFD) and HELCOM assessments, including provision of current status for some elements (e.g. certain habitats and species under the Habitats Directive). The assessment of hazardous substances is comprehensive.

Weak points
There is insufficient quantification of the pressures and their impacts and only limited assessments of commercial fish, hydrographical changes, physical loss and acute pollution events. There is no report on mammals. There are few conclusive judgments on current status for a number of descriptors, pressures and ecosystem components. There is insufficient detail on how gaps in knowledge are going to be addressed.

Overall score
The Initial Assessment is assessed as being adequate for Descriptor 8. For Descriptors 1, 2, 4, 5, 6, 9 and 11 the Initial Assessment is considered partially adequate, with several key elements missing or poorly assessed (e.g. mammals) and limited assessments of impacts. For Descriptors 3, 7 and 10 the Initial Assessment is considered to be inadequate.

ENVIRONMENTAL TARGETS (Art. 10)

Strong points
There is substantial detail including a good range of indicators for Descriptors 1, 2, 3, 4, 5, 6, 8, and 11. Use is made of the WFD, HELCOM and other relevant standards (e.g. Descriptors 5, 9). Descriptor 11 addresses discharged waste heat as well as underwater noise.

Weak points
The targets for Descriptors 1, 2, 4 and 6 are generally expressions of GES and would better sit under Art. 9. Many provide normative definitions of GES and require more specific quantitative thresholds to be fully measurable. Descriptor 7 addresses only broad aspects of hydrological conditions and lacks reference to hydrographical changes due to infrastructure developments. Environmental targets are often not sufficiently clear or SMART to be measurable.
Overall score

The targets for Descriptor 5 have been assessed as adequate. Descriptor 4 is close to adequate, but not fully measurable.

The targets for Descriptors 1, 2, 3, 6, 8, 9 and 11 have been assessed as partially adequate since they lack some specificity (thresholds, baselines) or coverage (e.g. some commercial species).

The targets for Descriptor 7 and 10 are considered inadequate as they lack reference to hydrographical changes or specification and are therefore not measurable.

Consistency

There is a good level of consistency between GES, the initial assessment and the environmental targets for most descriptors, although it is not always clear that the targets are sufficient to achieve GES (e.g. Descriptors 7, 9, 11).

Identified gaps and plans to address them

Justification and explanation on gaps in data/knowledge and assessment methodology are not well described. Plans to address them are scarce and not detailed.

Recommendations

Finland should:

i. Strengthen the GES definition of the biodiversity descriptors which goes beyond what is in existing legislation;

ii. Improve GES definitions including through regional cooperation using the work of the Regional Seas Convention as much as possible focusing on quantitative aspects and baselines, with the aim to make GES measurable, focusing especially on those descriptors assessed as inadequate or partially adequate;

iii. Identify knowledge and information gaps and address these, i.a. through the monitoring programme under the MSFD and research programmes, focusing on those descriptors considered as inadequate or partially adequate;

iv. Address knowledge gaps identified in the initial assessment, i.a. through the monitoring programme under the MSFD and research programmes, focusing on those descriptors considered as inadequate or partially adequate;

v. Ensure that the targets cover all relevant pressures, are SMART and sufficiently ambitious in order to achieve the requirements and timelines of the MSFD.

France

General issues

Marine waters

France is part of two marine regions, the North East Atlantic and the Mediterranean. It marine waters occur in four marine sub-regions: the Celtic Seas, the Greater North Sea, the Bay of Biscay, and the Western Mediterranean Sea.
Areas assessed
The assessment area is the sub-region as a whole. At this stage, no more specific assessment areas have been defined. Data on more limited areas or assessment of more limited areas are used for evaluation at the scale of the marine sub-region. France indicates that aggregation rules at the level of the descriptor will be specified, if necessary, following complementary studies, in the framework of the updating of the definition of GES for the next cycle, that is by 2018.

Regional cooperation
France is party to the Barcelona Convention and OSPAR. Efforts for regional coordination within the MSFD Common Implementation Strategy, regional sea conventions and informally through bilateral contacts are extensively described.

Other features
The socio-economic analysis was undertaken through a "water account" approach, together with a cost-based approach for the cost of degradation. The methodology used is described comprehensively. The different costs cannot be aggregated as they are of different nature (annual accounting expenses, loss of benefits both commercial and non-commercial). Therefore, it still lacks a cost analysis which will be done when developing operational targets. France establishes four transversal targets for the Bay of Biscay and the Celtic Seas subregions. These are meant to ensure the link land-sea to guarantee the natural balance of the marine environment; to raise awareness, train and inform players, users and the public; to allow by maintaining or reaching GES the sustainable development of the human activities which depend upon the marine environment; and finally to restore deteriorated ecosystems. However, no transversal targets have been identified for the Greater North Sea or Western Mediterranean Sea subregions.

DETERMINATION OF GOOD ENVIRONMENTAL STATUS (ART. 9)

Strong points
France covers, in general terms, most of the GES in line with the Directive. The report covers most of the indicators and for some descriptors even more. It is based on a robust legal status of GES and methods and criteria for undertaking the initial assessment and setting environmental targets and associated indicators. EU requirements and standards have been systematically used.

Weak points
Overall, GES is defined qualitatively, and not quantitatively. This choice, combined with a lack of baseline and reference conditions, leads to a general lack of clarity about what GES is and when it can be understood as reached or not. This lack of specificity means that all pressures and impacts on the marine environment are often not clearly and efficiently covered, which in turn can pose problems in terms of environmental targets definition, monitoring, and to develop a programme of measures.

Overall score
Five GES definitions are considered as adequate (Descriptors 4, 7, 8, 10 and 11) thanks to an adequate coverage of Decision criteria and relevant use of regional approaches.

The COMMON SENSE project has received funding from the European Union’s Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.
Three GES definitions are considered as partially adequate (Descriptors 1, 5 and 6) mainly due to a lack/uncertainty concerning baseline/thresholds.
Two GES definitions are considered as inadequate (Descriptors 2 and 3) mainly due to a very limited coverage of Decision criteria together with a lack of baseline/thresholds.

INITIAL ASSESSMENT (ART. 8)

Strong points
The main problems (pressures and impacts) have been identified for all descriptors mainly thanks to an extensive use of existing information/data.
With regards to the assessment of biological features for biodiversity and associated descriptors, France provides an assessment of status for specific species recognized as endangered or threatened according to EU, regional and international agreements.
The French assessment of the level of fisheries pressure has been reported in detail (including quantitative information) for all subregions.

Weak points
For habitats, France has not reported on all relevant habitat types. For species/functional groups, France did not report on all expected/relevant groups. Judgments on the state of the environment are often missing.

Overall score
Five initial assessments for the pressure/impact are considered as adequate (Descriptors 2, 3, 7, 10 and 11) thanks to a good qualitative judgment made in relation to GES.
Six initial assessments for the pressure/impact are considered as partially adequate (Descriptors 1, 4, 5, 6, 8 and 9) mainly due to a limited assessment on impacts and lack of judgement in relation to GES.

ENVIRONMENTAL TARGETS (ART. 10)

Strong points
General targets have been set which, according to France, can be further developed into specific targets, and complemented by operational targets in 2015 aiming at directing actions and the definition of measures to reach them.
In the Mediterranean region, targets are often well detailed with associated indicators but do not cover all descriptors.
Many transversal targets have been set up, ranging from research activities to the reinforcement of legal and international cooperation tools and information and training related targets.

Weak points
There is a lack of quantification of targets combined with a lack of baseline and reference conditions. This lack of specificity means that all pressures and impacts are often not clearly and efficiently covered. France does not go beyond existing standards at EU or regional level and without making the case that their full implementation would be sufficient for reaching GES.
Overall score

For the Atlantic coast, all targets are assessed as being inadequate except partially adequate for Descriptors 9, 10 and 11.

For the Mediterranean, six descriptors have partially adequate targets (Descriptors 1, 4, 6, 8, 10 and 11) mainly due to a lack of threshold values and baselines.

The targets of two other descriptors (Descriptors 2, 3) are considered as inadequate, mainly due to the fact that they are not relevant for that descriptor (and the defined GES). For Descriptors 5, 7 and 9 targets are missing.

CONSISTENCY

The approach followed by France is overall consistent in terms of the approach used for the setting of targets, GES and descriptors. There is a difference in the approach to the setting of targets on one hand, for the North East Atlantic sub-regions and, on the other hand, for the Mediterranean. In general the targets defined for the Mediterranean subregion are much more pressure-specific and measurable than for the other subregions. All descriptors under the MSFD are covered. It is based on a robust legal status of GES and methods and criteria for carrying out the initial assessment and setting environmental targets and associated indicators. EU requirements and standards have been systematically used.

IDENTIFIED GAPS AND PLANS TO ADDRESS THEM

Data and knowledge gaps appear to be a recurrent issue. For most of them, France states that due consideration will be given to these knowledge gaps in the framework of the revisions of the different elements for the next cycle in 2018, as provided for by Article 4 of the French Ministerial Order on GES. There are no further indications in terms of concrete actions and responsibilities.

RECOMMENDATIONS

France should:

i. Strengthen methodology for the socio-economic analysis allowing assessment of the degradation/restoration costs and MSFD implementation costs/benefit analysis;

ii. Improve GES definitions including through regional cooperation using the work of the Regional Seas Convention as much as possible focusing on quantitative aspects and baselines, with the aim to make GES measurable, focusing especially on those descriptors assessed as inadequate or partially adequate;

iii. Address knowledge gaps identified in the initial assessment, i.a. through the monitoring programme under the MSFD and research programmes, focusing on those descriptors considered as inadequate or partially adequate;

iv. Ensure that the targets cover all relevant pressures, are SMART and sufficiently ambitious in order to achieve the requirements and timelines of the MSFD;

v. Enhance the cohesion between approaches in the two relevant regions.
Germany

GENERAL ISSUES

Marine waters

The German marine waters are part of two marine regions, the North-East Atlantic Ocean and the Baltic Sea.

Areas assessed

Germany’s initial assessment, characteristics of GES and targets and associated indicators have been developed for each marine (sub-)region. For a number of descriptors, specific details are provided with regard to the Wadden Sea (e.g. for the definition of standards or thresholds to be complied with).

Regional cooperation

The German part of the North Sea is part of the OSPAR Region II “Greater North Sea”. For the Baltic Sea, the German marine waters cover the following HELCOM-defined sub-areas: “Southern Baltic Sea” (with the “Arkona” and the “Bornholm Basin”), “Bay of Mecklenburg”, “Kiel Bay” and “Little Belt”. Efforts for regional coordination within both regional conventions are extensively described in several places (reporting sheet, specific report on regional coordination).

Other features

The economic and social analysis of marine uses by Germany used the water accounts approach. The description of each sector of activity is relatively limited and only semi-quantitative because of the lack of data. Germany mentions that the North Sea and the Baltic Sea are not separately assessed in official statistics, so the data handling is difficult.

Germany uses a combination of the water accounts and thematic approaches for the evaluation of the costs of degradation. This method allows Germany to derive the costs of the difference between the good status of the marine environment (i.e. reference state) and the current state. However, in order to do this, the good environmental status (GES) needs to be clearly defined, which is not the case today for all descriptors. Germany mentions that the costs can be expressed in Euros only if a quantification of impacts has been made, which is not the case to date. It does not provide an indication of timeline to do this work.

DETERMINATION OF GOOD ENVIRONMENTAL STATUS (ART. 9)

Strong points

The definitions of GES for several descriptors are described at descriptor and criteria level (Descriptors 3, 5, 7, 8).

Germany formulated an ambitious definition of GES for Descriptor 2 aiming at zero introductions of new non-indigenous species and provided a detailed definition of Descriptor 3 on commercial fish and shellfish. The GES definition for Descriptor 11 on energy inputs is extended with aims related to electromagnetic fields, light and temperature increase.
Weak points

What Germany has reported as a GES definition for biodiversity is a collection of existing agreements and therefore covers only specific protected habitats and species. Germany has not provided an assessment/justification as to why this is considered to be sufficient for achieving GES. Other descriptors are only described at descriptor level and are vague.

Overall score

Descriptor 3 is assessed as adequate. Descriptors 2, 5, 7, 8, 9 and 11 are assessed as being partially adequate as they are only defined at descriptor level or lack thresholds. Descriptors 1, 4 and 6 are assessed as inadequate as they do not go beyond existing legislation of mainly protected species, without assessing if this would be sufficient for achieving GES and missing some key aspects of biodiversity. Descriptor 10 is also assessed as inadequate.

INITIAL ASSESSMENT (ART. 8)

Strong points

Overall, the Initial Assessment is performed in a detailed manner, especially for contaminants, litter and underwater noise. The main pressures have been identified and described, including microbial pathogens.

Weak points

Not all relevant habitats and functional groups are covered. The assessment of the pressures and impacts is general and not detailed. The initial assessment is primarily a collection of existing information but almost no judgment on current status and trends in status is made.

Overall score

The assessment of Descriptors 2, 8, 10 and 11 is considered adequate. For all other descriptors the assessment is partially adequate as the initial assessment is general and qualitative.

ENVIRONMENTAL TARGETS (ART. 10)

Strong points

Germany has developed an extensive list of targets and associated indicators.

Weak points

A number of targets are rather expressions of GES than actual targets defined to help achieve GES (e.g. some indicators for Descriptors 2, 8 and 9). Most targets are not specific enough (even when they addressing specific issues) and are not systematically quantified. Many targets and the associated indicators are only qualitative and these targets still need further development.
Overall score

None of the targets are assessed as being adequate. The targets for Descriptors 2, 3 and 7 are considered inadequate because they lack attributes which make them SMART. The targets for Descriptors 1, 4, 6, 5, 8, 9 10 and 11 are considered partially adequate since they do not fully address the three biodiversity descriptors (Descriptors 1, 4, 6), miss quantification (Descriptor 5), express GES (Descriptors 8, 9) or miss threshold values (Descriptors 10, 11).

CONSISTENCY

The approach followed by Germany is not overall consistent in terms of the approach used for the setting of GES and targets for all descriptors and across the two (sub-)regions. In a number of cases there is a difference between the information reported in the paper report and in the reporting sheets. This is mainly the case for the GES definitions of Descriptors 3, 5, 8 and 11, which are further developed at the indicator level in the reporting sheets. Some targets have been defined more as a description of GES (Descriptors 2, 8 and 9). In other cases (Descriptor 5) they do not address the identified pressures.

IDENTIFIED GAPS AND PLANS TO ADDRESS THEM

While data and knowledge gaps are generally acknowledged and broadly identified, Germany often relies on future work in the framework of the MSFD and of the Regional Sea Conventions without further specifications as to when, how and by whom they will be addressed.

RECOMMENDATIONS

Germany should:

i. Strengthen the GES definition of the biodiversity descriptors to go beyond what is in existing legislation;

ii. Improve GES definitions including through regional cooperation using the work of the Regional Seas Convention as much as possible focusing on quantitative aspects and baselines, with the aim to make GES measurable, focusing especially on those descriptors assessed as inadequate or partially adequate;

iii. Address knowledge gaps identified in the initial assessment, i.a. through the monitoring programme under the MSFD and research programmes, focusing on those descriptors considered as inadequate or partially adequate;

iv. Further develop its approaches to assessing (quantifying) impacts from the main pressures to lead to improved and more conclusive assessment results for 2018;

v. Ensure that the targets cover all relevant pressures, are SMART and sufficiently ambitious in order to achieve the requirements and timelines of the MSFD;

vi. Improve the consistency between the criteria used in GES, the assessment of the impact and the proposed targets;

vii. Enhance the cohesion between approaches in the two relevant regions.

Greece
GENERAL ISSUES

Marine waters

Greece’s marine waters fall within one marine region, the Mediterranean Sea, and three marine subregions, the Adriatic Sea; the Ionian Sea and the Central Mediterranean Sea; and the Aegean-Levantine Sea. No formal subdivisions have been identified.

Areas assessed

The GES definitions and targets are defined for the whole of the Greece’s marine waters together, with no distinction of specific assessment areas.

The initial assessment in the paper report considers at most five different assessment areas: three areas in the Aegean subregion (North, South and Central), the Adriatic and Ionian Seas together and the Levantine assessment area separately.

In terms of aggregation rules, Greece has made a number of aggregated judgements in relation to GES but it has not clearly defined aggregation rules and it is not always clear how it has come to these conclusions.

Regional cooperation

In terms of regional cooperation, Greece refers to the efforts made to assess data coming from neighbouring countries in order to ensure some consistency in the definition of GES and the establishment of targets and indicators.

Other features

Greece has carried out an economic and social analysis using the DPSIR approach. The socio-economic analysis of marine uses is based on a combination of the ecosystem services approach and the water accounts approach. The marine water accounts approach seems to be the approach also used for the analysis of the costs of degradation.

DETERMINATION OF GOOD ENVIRONMENTAL STATUS (ART. 9)

Strong points

All the descriptors under the MSFD are covered and for all descriptors, with the exception of Descriptor 3, a general definition of GES is provided. In a few cases, a number of more specific conditions are added.

EU requirements and standards are used (e.g. for D 8, 9).

For Descriptor 8, the definition of GES also partly covers radionuclides, which is considered a good practice.

Weak points

There is lack of clarity in what constitutes GES (in particular for Descriptor 3) and a lack of consistency between the paper report and the reporting sheets.

There is no systematic use of the 2010 Commission Decision criteria and indicators and in most cases no threshold values and baselines are provided. Thus, the GES definition is not considered to be measurable.
Overall score

Descriptor 5 is assessed as adequate, as it covers all the criteria and most indicators and provides sufficient thresholds for GES to be measured.

Five GES definitions are considered as partially adequate (Descriptor 1, 4, 8, 9 and 11) mainly due to a lack of or uncertainty concerning baseline/thresholds and absence of coverage of all the Decision criteria.

For the remaining descriptors (Descriptor 2, 3, 6, 7 and 10) the determination of GES does not meet the minimum requirements and is assessed as inadequate. No information is provided about baselines or reference points to assess progress towards GES.

INITIAL ASSESSMENT (Art. 8)

Strong points

The structure of the initial assessment is relatively clear and, for a number of pressures, an attempt is made to judge the level of, and impacts from, the pressure in relation to GES.

An extensive list of non-indigenous species has been reported and their current status and pathways of introduction have been identified. For commercial fish and shellfish, Greece performed an assessment at a relatively high level of detail. It has also made a relatively detailed assessment of contamination by radionuclides in the five assessment areas.

Weak points

For a number of pressures, the initial assessment is limited to a collection of information from existing literature without a clear objective to assess current status.

Impacts from pressure are rarely reported on (e.g. Descriptor 5) or are reported only in a general way (e.g. Descriptor 2, 3). No assessment has been made of the pressure from underwater noise (Descriptor 11).

The initial assessment considers at most five different assessment areas; however this is not consistent throughout the report and for a number of pressures the assessment is made for the whole of the country’s marine waters.

Overall score

Three initial assessments for the pressure/impact are considered as adequate (Descriptor 3, 5 and 10) thanks to a good qualitative judgment made in relation to GES on trends, the provision of thresholds and baselines and of substantial information on knowledge gaps and plans to address them.

Five initial assessments for the pressure/impact are considered as partially adequate (Descriptor 2, 6, 7, 8 and 9) mainly due to a lack of judgement in relation to GES and a limited assessment of impacts.

Only the initial assessments for Descriptors 1 and 4 are considered as inadequate, mainly due to the limited provision of information and the lack of judgement of status in relation to GES.

No initial assessment was undertaken on the level of pressure from underwater noise (Descriptor 11), but sufficient justification is provided for this issue.
ENVIRONMENTAL TARGETS (ART. 10)

Strong points

Environmental targets and indicators have been adopted by Ministerial Decision No. OIK 1175/2012, conferring a strong legal status upon Greece’s environmental targets and indicators. The setting of environmental targets and indicators is consistent for all descriptors (although there are some differences between targets in the paper report and the reporting sheets).

Weak points

Many environmental targets are monitoring targets (e.g. Descriptor 4, 8 and 10) and are not sufficient to achieve GES. In most cases, no threshold values or baselines are provided and the targets do not cover the different pressures and impacts identified in the initial assessment. The role of the associated indicators (i.e. for assessing the achievement of the environmental targets) is not always clear.

Overall score

Targets related to Descriptors 5 and 9 are partially adequate since, although qualitative and lacking in detail, are considered realistic. The targets of all the remaining descriptors (Descriptor 1, 2, 3, 4, 6, 7, 8, 10 and 11) are considered inadequate, mainly due to the fact that they are not SMART, they lack threshold values and baselines and it is unclear how they will achieve GES.

CONSISTENCY

The approach followed by Greece in the assessment of pressures and impacts and the definition of GES and the setting of environmental targets is in general terms consistent. Low consistency has been reported for Descriptor 2, while for Descriptor 11, it was not possible to assess the consistency since there was no proper assessment of pressures and impacts.

IDENTIFIED GAPS AND PLANS TO ADDRESS THEM

Data and knowledge gaps are usually identified and described for each article (GES, initial assessment and targets). However, plans to address knowledge and data gaps are usually quite vague, limited to the mention of on-going or planned research projects (without specific details about the projects) and without details of timescales or responsibilities.

RECOMMENDATIONS

Greece should:

i. Improve GES definitions including through regional cooperation using the work of the Regional Seas Convention as much as possible focusing on quantitative aspects and baselines, with the aim to make GES measurable, focusing especially on those descriptors assessed as inadequate or partially adequate;

ii. Address knowledge gaps identified in the initial assessment, i.a. through the monitoring programme under the MSFD and research programmes, focusing on those descriptors considered as inadequate or partially adequate;
iii. Further develop its approaches to assessing (quantifying) impacts from the main pressures to lead to improved and more conclusive assessment results for 2018;

iv. Ensure that the targets cover all relevant pressures, are SMART and sufficiently ambitious in order to achieve the requirements and timelines of the MSFD.

Ireland

GENERAL ISSUES

Marine waters

Ireland’s marine waters fall within the North-East Atlantic Ocean marine region and within the marine sub-region known as the Celtic Seas. Their marine waters include coastal waters, as defined under the Water Framework Directive, and an EEZ. An area of Continental Shelf beyond the EEZ is also included, whilst other such areas await the outcomes of UNCLOS processes. There are areas of overlap and gaps with UK waters at both the coastal boundaries with Northern Ireland and the median line boundary in the Irish Sea and Celtic Sea.

Areas assessed

For the purposes of reporting on MSFD Articles 8, 9 and 10 Ireland has defined a single assessment area, covering their entire marine waters. The use of such a large assessment scale can mask more localised but nevertheless significant problems for particular areas or biodiversity components.

Regional cooperation

Ireland is party to the OSPAR Convention. Efforts for regional coordination within the regional convention, as well as through ICES and bilaterally with UK and FR, are extensively described.

Other features

Ireland has followed a water account approach for their economic and social assessment and an ecosystem-service approach to estimate the costs of degradation. There are insufficient details (in the reporting sheet) to adequately assess this analysis.

DETERMINATION OF GOOD ENVIRONMENTAL STATUS (ART. 9)

Strong points

Ireland addresses GES for all descriptors, and includes some criterion-level details. They have systematically used existing EU requirements and standards and place a strong emphasis on work and standards under the RSC (OSPAR).

Weak points

GES is defined mainly at the descriptor level, but including some elements of the criteria; it is generally only qualitative and therefore not measurable.

When using OSPAR and EU requirements and standards e.g. for Descriptor 8, Ireland does not address potential issues of hierarchy between those requirements.

Overall score

No Descriptors are assessed as adequate.

The COMMON SENSE project has received funding from the European Union’s Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.
Descriptors 1, 2, 3, 4, 5, 7, 8, 10 and 11 are assessed as partially adequate, as they either do not fully address the Decision criteria or they lack key elements or specificity. Descriptors 6 and 9 are assessed inadequate as they are below the minimum requirement.

**INITIAL ASSESSMENT (ART. 8)**

**Strong points**

On the whole, the main pressures and their sources have been identified and reported on. New assessments have been made in relation to emerging issues e.g. marine litter.

**Weak points**

There is generally limited assessment of impacts from pressures, particularly in a quantitative manner, and few conclusive judgments on current status. For many descriptors and assessment topics, no new assessment has been made specifically for the implementation of the MSFD.

**Overall score**

The Initial assessment is assessed as being adequate for Descriptors 2, 3, 5, 8, 10 and 11, with generally good coverage of the main pressures and their sources; assessments of impacts and overall status are however more limited. For Descriptors 1, 4, 6 and 7, the initial assessment is considered partially adequate, with several key elements missing (e.g. birds, mammals) and limited assessments of impacts. For Descriptor 9, the initial assessment is considered inadequate, with very limited assessments of contaminants in shellfish.

**ENVIRONMENTAL TARGETS (ART. 10)**

**Strong points**

Targets for Descriptor 5 are considered SMART, ambitious and well-focused towards a reduction in impacts. Targets for Descriptors 3, 7, 8 and 9 are also well specified, although overall lacking in certain elements.

**Weak points**

There are no targets for Descriptors 1, 4, 6 and 11. Environmental targets are often not sufficiently clear or SMART to be measurable. A number of targets and the associated indicators to these targets still need further development and are expected to be operational only in 2014 or 2018.

**Overall score**

The targets for Descriptor 5 have been assessed as adequate. The targets for Descriptors 2, 3, 7, 8, and 9 have been assessed partially adequate since they lack some specificity or coverage and are thus not fully quantifiable. The targets for Descriptors 1, 4, 6 and 11 are absent and therefore inadequate.
CONSISTENCY

There is a good level of consistency between GES, the initial assessment and the environmental targets for most descriptors.

IDENTIFIED GAPS AND PLANS TO ADDRESS THEM

As a rule, extensive justification/explanation is provided on gaps in data/knowledge and assessment methodology. However, Ireland does not always specify how these gaps will be addressed and sometimes relies on developments at EU or regional level, without always clear deadlines.

RECOMMENDATIONS

Ireland should:

i. Strengthen the GES definition of the biodiversity descriptors in a way which goes beyond what is in existing legislation;

ii. Improve GES definitions including through regional cooperation using the work of the Regional Seas Convention as much as possible focusing on quantitative aspects and baselines, with the aim to make GES measurable, focusing especially on those descriptors assessed as inadequate or partially adequate;

iii. Address knowledge gaps identified in the initial assessment, i.a. through the monitoring programme under the MSFD and research programmes, focusing on those descriptors considered as inadequate or partially adequate;

iv. Further develop its approaches to assessing (quantifying) impacts from the main pressures to lead to improved and more conclusive assessment results for 2018;

v. Ensure that the targets cover all relevant pressures, are SMART and sufficiently ambitious in order to achieve the requirements and timelines of the MSFD.

Italy

GENERAL ISSUES

Marine waters

Italy’s marine waters are part of the marine region of the Mediterranean Sea and cover the sub-regions of the Adriatic Sea, the Ionian Sea and the Central Mediterranean Sea and the Western Mediterranean Sea. No formal subdivisions have been identified.

Areas assessed

The GES definitions and targets are, in most cases, defined for the whole of Italy’s marine waters together, with no distinction of specific assessment areas. Assessment areas were defined for the initial assessment, differing according to the topic in question. Italy indicates that these areas may coincide with or may be representative of the sub-regions.

Regional cooperation

Italy is party to the Barcelona Convention. Efforts of regional coordination have been described, in which the necessity of obtain a successful coordination amongst countries, mainly through existing international cooperation instruments, has been stressed. Italy participated in a first meeting of trilateral coordination with France and Spain to compare country approaches and the general frame and
implementation of the initial assessment, determination of GES and environmental targets for the Western Mediterranean Sea sub-region.

Other features

The economic and social analysis of marine uses has been undertaken using the water accounts approach. Data and methodologies have been briefly described for each subregion or for the entire Mediterranean region, depending upon the activity considered (professional, commercial, recreational fisheries, tourism, ports, oil and gas). Results, when available, are traceable, even though they are often not provided due to lack of information and data gaps.

Italy has followed a cost-based approach to evaluate the costs of degradation. The sources of information have been described but the methodology is barely mentioned and the description is not exhaustive. Costs of degradation has been considered as a whole in the paper report and information gaps are clearly highlighted, whereas neither specific plans or actions nor a time schedule to address these gaps have been reported.

Determination of Good Environmental Status (Art. 9)

The approach used to define GES varies. For some descriptors GES is defined at descriptor level (Descriptor 11), in other cases is defined only at criterion level (Descriptors 2, 8 and 9), in other cases at descriptor, criteria and indicator level (Descriptors 5, 10), and for the remaining descriptors, at criterion and indicator levels (Descriptor 3, 7).

Strong points

All descriptors are covered.

Italy has provided a threshold when setting GES for Descriptor 3 indicators 3.3.1 and 3.3.3. These have been applied with a threshold requiring that the indicator should remain stable or show significant positive trends for commercial fish all stocks; this is considered a best practice.

Weak points

Some GES definitions are still to be developed. In general there is a lack of ambition in the GES definitions.

Overall score

Descriptors 1, 3, 5, 6, 2, 7, 8 and 9 are assessed as partially adequate, mainly due to a lack/uncertainty concerning baseline/thresholds.

Descriptors 4, 10 and 11 are assessed as inadequate as they are below the minimum requirement or lack specification/ambition.

Initial Assessment (Art. 8)

Overall, the initial assessment is mainly descriptive.

Strong points

Information gaps are clearly identified; these gaps affect the identification of pressures and impacts for the descriptors.
The initial assessment is well-focused on the needs of the marine strategy; Italy has made a fair attempt to provide judgments on status and trends, with the exception of Descriptors 8 and 9. Various assessment areas have been used for the initial assessment, depending on the descriptor.

**Weak points**

Pressures are sparsely reported for some descriptors in accordance to availability of information and analysis, whereas impacts are often not provided. Judgments on the current status in relation to GES are not consistently made.

**Overall score**

The initial assessment for Descriptor 7 is assessed as being adequate. Italy reports on the percentage of areas affected and a judgement on current status is provided. In addition, the knowledge gaps are clearly identified and the plans to address them well described.

Seven initial assessments for the pressure/impact are considered as partially adequate (Descriptor 1, 2, 3, 4, 5, 6 & 10 (for West Mediterranean and Adriatic)) mainly due to a lack of judgment in relation to GES.

The initial assessments for the pressure/impact are considered as inadequate for Descriptor 8 and missing for Descriptors 9 and 11.

**Environmental Targets (Art. 10)**

In general, the environmental targets were more clearly presented and more complete (e.g. with indications of the associated indicator) in the paper report than in the reporting sheets. Therefore, the assessment has focused on the version from the paper report.

**Strong points**

In relation to Descriptor 3, Italy has included an environmental target addressing recreational fisheries. Italy has set a target, and developed an assessment methodology, to reduce marine litter ingested by the sea turtle *Caretta caretta*, a promising alternative for the Fulmars’ target in the North-East Atlantic Ocean.

**Weak points**

The vast majority of environmental targets are defined as ‘interim’ targets with the exception of those set for Descriptor 8. Italy has not set environmental targets for Descriptors 7, 9 and 11. Moreover, there is a general lack of ambition, in relation to both GES definitions and targets.

**Overall score**

One descriptor has partially adequate targets (Descriptor 10) mainly due to a lack of threshold values and baselines.

The targets of Descriptor 1, 2, 3, 4, 6, 5 & 8 are considered as inadequate, mainly due to the fact that the identified targets are generic or not all relevant for that descriptor (and the defined GES).

No targets have been defined for D 7, 9 and 11.
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CONSISTENCY

In general it can be said that the GES definitions and the initial assessment are very specific in regard to species and habitats of which most are not explicitly referred to in the targets. There is, for instance, also no specific target for birds while they are part of the GES definition for Descriptor 1. There is more consistency between the determination of GES, its assessment and targets for Descriptor 3. Consistency could not be checked for the missing elements (Descriptor 7, 9, 11).

There are sometimes discrepancies between the paper report and the reporting sheets; when the differences were more substantial; as a rule, the assessment was based on the most complete/clearer version.

IDENTIFIED GAPS AND PLANS TO ADDRESS THEM

Data and knowledge gaps are generally identified and well described for each Article (GES, initial assessment and targets).

The need to establish monitoring campaigns and standardized sampling is highlighted and frequently mentioned but specific plans are not always provided.

RECOMMENDATIONS

Italy should:

i. Strengthen methodology for the socio-economic analysis allowing assessment of the degradation/restoration costs and MSFD implementation costs/benefit analysis;

ii. Improve GES definitions including through regional cooperation using the work of the Regional Seas Convention as much as possible focusing on quantitative aspects and baselines, with the aim to make GES measurable, focusing especially on those descriptors assessed as inadequate or partially adequate;

iii. Address knowledge gaps identified in the initial assessment, i.a. through the monitoring programme under the MSFD and research programmes, focusing on those descriptors considered as inadequate or partially adequate;

iv. Further develop its approaches to assessing (quantifying) impacts from the main pressures to lead to improved and more conclusive assessment results for 2018;

v. Ensure that the targets cover all relevant pressures, are measurable, SMART and sufficiently ambitious in order to achieve the requirements and timelines of the MSFD;

vi. Improve the consistency between the criteria used in GES, the assessment of the impact and the proposed targets.

Latvia

GENERAL ISSUES

Marine waters

Latvia’s marine waters extend from the seaward side of the border from which their territorial waters are measured and cover their territorial sea and EEZ, which extend to the border with Estonia and Sweden. Latvia has agreements setting international maritime boundaries with Sweden and Estonia but not Lithuania.
Areas assessed

Latvia has defined a number of assessment areas depending on the topic under consideration. They include: open rocky and open sandy coasts of the south-east Baltic Sea, moderately open rocky and moderately open sandy coasts of the Gulf of Riga, the transitional waters of the Gulf of Riga, the open part of the Baltic Sea (i.e. territorial sea and EEZ) and the central part of the Gulf of Riga.

Regional cooperation

Latvia refers extensively to regional cooperation via HELCOM and uses HELCOM assessments, indicators and assessment units for their Initial Assessment but reports that corresponding criteria were not developed for all of the MSFD descriptors. Latvia has also not managed to fully participate in the HELCOM work to attempt to harmonise the determination of GES across Member States.

Other features

Latvia has used the ecosystem approach for the economic and social analysis of marine uses and the cost of degradation, using the guidelines provided by WG-ESA to inform their national ESA approach.

Determination of Good Environmental Status (Art. 9)

Strong points

GES is quantified for Descriptors 3, 5 and 9. Descriptor 3 applies the primary indicators provided in the Commission Decision for criteria 3.1 and 3.2 and, in line with Commission guidance, sets the thresholds at $F_{\text{MSY}}$ and $SSB_{PA}$ or $SSB_{PAM}$ although only for cod, salmon, sprat herring and flounder.

Weak points

Not all the MSFD descriptors are covered in the determination of GES; descriptors 4, 7, 8, 10 and 11 are not defined. The descriptors for biodiversity (Descriptor 1 and 6) are more in line with what would be expected for Descriptor 5 (eutrophication). Descriptor 2 does not consider their spread through current pressures. The definition for Descriptor 9 only extends to the concentration of contaminants and does not address the frequency of regulatory levels being exceeded.

Overall score

Of the descriptors for which definitions were given, four were considered to be partially adequate (Descriptor 2, 3, 5 and 9), two are inadequate (Descriptor 1, 6) and the others are not defined.

Initial Assessment (Art. 8)

Strong points

Assessment of stocks of commercial fish and shellfish are well described and quantified. Descriptor 8 uses available data from HELCOM to provide a quantitative assessment of contamination by hazardous substances, although this relates to the Baltic Sea as a whole, rather than just Latvian waters. Results from an EU LIFE project on MPAs within the Gulf of Riga provide useful information on the contamination of fish and shellfish by heavy metals. In Descriptor 9, a good effort has been made to assess the current status, by assessment area and by substance, against GES thresholds. For descriptor 5, a quantified assessment of pressures is presented covering all the relevant nutrients and organic matter.
Weak points

The Initial assessment on physical loss and damage is limited in scope, there is no reference to HELCOM or WFD reports and no justification for how they reach the conclusion that the current level of impacts is 'good'.

For most descriptors, the assessment of the impacts is very limited. The assessment for Descriptor 2 seems to have been undertaken in the absence of solid data on non-indigenous species and their distribution, abundance and impacts.

Overall score

In the aspects where Initial Assessments were undertaken, six were considered to be partially adequate and two were inadequate (Descriptor 2, 6) because impact, level of and trend in pressure were not assessed. Impact Assessments for Descriptors 7, 10 and 11 were not undertaken because of a lack of data.

ENVIRONMENTAL TARGETS (ART. 10)

Strong points

Targets for Descriptor 3 are measureable and use the proper reference points of F_{MSY} and SSB_{pa} although these would need to cover all relevant commercial fish stocks to achieve GES by 2020. The set of targets and indicators presented for Descriptor 9 have the same values as the GES threshold values; achievement of the target should ensure achievement of GES.

Weak points

Biodiversity targets only address the quality of the benthic environment and ignore other aspects of biodiversity. The text of the target as set out in the reporting sheet is considered to be more appropriate as a definition of GES for habitats and species than for wider biodiversity. The target for Descriptor 2 is a "close approximation" of the MSFD Annex I text. Neither environmental targets nor associated indicators have been defined in the paper report. Many descriptors have no targets set.

Overall score

Only three descriptors have targets set (Descriptor 3, 5 and 9). These are all considered as partially adequate. Descriptors 1 and 6 are inadequate since they have only limited targets and Descriptor 2 is also inadequate because it repeats the generic definition of GES. Descriptors 4, 7, 8, 10 and 11 have no targets set.

CONSISTENCY

Consistency between the definition of GES, the initial assessment and the environmental targets varies across the descriptors. Where no information has been given (Descriptor 7, 10 and 11), it is impossible to assess. For Descriptors 1, 4 and 6, there is a lack of consistency between the initial assessment and GES or target definitions for all aspects, with the exception of benthic habitats, which is the only component for which a target has been defined.
There are differences between the paper report and the reporting sheets, for instance for Descriptor 3. Despite this, consistency is high since $F_{MSY}$ and $SSB_{pa}$ reference points were used for defining GES, setting targets and doing assessments.

There was a high level of consistency for Descriptor 9, as the same threshold values, corresponding to EU regulatory levels, were used for all three aspects.

**IDENTIFIED GAPS AND PLANS TO ADDRESS THEM**

Latvia reports comprehensively on the gaps in the availability of statistical data in relation to its economic and social analysis. It explains that there is a lack of scientific information on pressures on the marine environment. Spatial and temporal resolution of the available information is recognised as being too low for adequate assessments to be made and there is no method of distinguishing between local and transboundary impacts.

There are no plans presented about how such data gaps will be addressed.

**RECOMMENDATIONS**

Latvia should:

i. Strengthen the GES definition of the biodiversity descriptors which goes beyond what is in existing legislation;

ii. Improve GES definitions including through regional cooperation using the work of the Regional Seas Convention as much as possible focusing on quantitative aspects and baselines, with the aim to make GES measurable, focusing especially on those descriptors assessed as inadequate or partially adequate;

iii. Address identified knowledge gaps identified in the initial assessment, i.a. through the monitoring programme under the MSFD and research programmes, focusing on those descriptors considered as inadequate or partially adequate;

iv. Further develop its approaches to assessing (quantifying) impacts from the main pressures to lead to improved and more conclusive assessment results for 2018;

v. Ensure that the targets cover all relevant pressures, are SMART and sufficiently ambitious in order to achieve the requirements and timelines of the MSFD;

vi. Improve the consistency between the criteria used in GES, the assessment of the impact and the proposed targets.

**Lithuania**

**GENERAL ISSUES**

**Marine waters**

Lithuania’s marine waters include ‘internal waters’, the territorial sea and the Exclusive Economic Zone. The territorial sea covers 1,849km$^2$ and the EEZ covers 6,426.6km$^2$. ‘Internal waters’ are not defined but may encompass WFD coastal and transitional waters.

The southern part of the EEZ borders the Russian Federation (Kaliningrad) while the western area shares a maritime border with Sweden. The northern part borders Latvian waters. Latvia notes that there is no
agreement setting international maritime borders with Lithuania, although Lithuania does not refer to this situation.

**Areas assessed**

Lithuania has defined four subdivisions of its marine waters: transitional, coastal, territorial and EEZ.

**Regional cooperation**

There is limited information on regional cooperation, but participation in HELCOM-organised working groups and seminars is mentioned. However, Lithuania notes that not all Baltic Sea countries attended the relevant meetings for individual descriptors so cooperation at descriptor level across the region was intermittent.

**Other features**

For economic and social analysis of marine uses, Lithuania used a non-typical approach. It follows a logical scheme, which reflects all possible uses of the marine environment, using social and economic analysis methods.

For analysis of the cost of degradation, the Ecosystem Services Approach, the Thematic Approach or the Cost-based Approach has been applied, depending on the availability of data. Data availability appears to be patchy but there is no overall assessment of gaps or of how gaps should be addressed.

**Determination of Good Environmental Status (Art. 9)**

**Strong points**

It is noted that the attention given to seabird abundance is encouraging, with specific species indicators provided and concrete GES boundaries and baselines for calculations.

**Weak points**

GES is not defined for Descriptors 7, 10 and 11. Species are addressed only through seabirds and fish. Even where indicators exist, they are not species-specific. There is no reference to habitats, functional groups or ecosystem components. GES definitions for the biodiversity descriptors seem to be different for coastal, marine and transitional waters with different thresholds.

**Overall score**

Determination of GES for Descriptors 2, 8 and 9 is considered to be partially adequate.

Determination of GES for Descriptors 1, 3, 4, 5 and 6 is considered to be inadequate due to a number of factors, including an inequality of attention given to all the relevant criteria of the Commission Decision and failure to require fish stocks to be within safe biological limits.

**Initial Assessment (Art. 8)**

**Strong points**

The assessment for Descriptor 2 provides a list of non-indigenous species and identification of the main transmission vectors. The assessment also covers impact, level of and trend in pressure both in general and in different habitats.
For Descriptor 9 a quantitative assessment is made of current levels of contamination for all relevant substances included in the GES definition and a conclusive judgement is given. The process also includes an assessment of levels of radionuclides, which is considered to be best practice.

**Weak points**

No reference is made to the WFD or HELCOM reports on physical loss and damage (Descriptor 6).

There is inconsistency between level of detail provided in the paper report and the reporting sheet, especially in Descriptors 8 and 11.

For Descriptor 7, some pressures have been described but the impacts cited have not been sufficiently assessed. It is considered that with the amount of information available in HOLAS, a more robust assessment would have been possible.

**Overall score**

The Initial Assessments for Descriptors 2 and 9 were considered adequate, while those covering Descriptors 1, 4, 5, 6, 8 and 11 were judged to be partially adequate.

Those for Descriptors 3, 7 and 10 were considered to be inadequate due to stocks not being assessed in relation to MSY, insufficient assessment according to the reference material available and the age of data used respectively.

**ENVIRONMENTAL TARGETS (ART. 10)**

**Strong points**

The environmental targets and associated indicators for Descriptor 3 consider the exploitation at F\(_{\text{MSY}}\) of three stocks (cod, sprat and Baltic herring) in a SMART context and with a clear deadline of achievement by 2020.

**Weak points**

No environmental targets are established for Descriptors 7, 10 or 11.

For Descriptor 1, the overall target is an expression of GES rather than an operational tool that will help achieve GES. The targets for Descriptor 5 are also considered to fall into this category.

For contaminants in Descriptor 8, it is considered that there is no overall target that sets the goal towards which all other indicators should aim. None of the Descriptor 8 targets are pressure-based; instead all are state-based.

**Overall score**

The environmental targets for Descriptor 3 are considered adequate but those for Descriptors 1, 2, 5, 8 and 9 are noted as being inadequate. Several were merely an expression of GES, instead of specific objectives that related to particular pressures, and were unlikely to help achieve GES by the target date of 2020. No environmental targets were established for Descriptors 7, 10 and 11.

**CONSISTENCY**

Consistency between definitions of GES, initial assessments and environmental targets varies across the descriptors. Some (Descriptor 3, 5, 8) have a high level of consistency between their definitions and the COMMON SENSE project has received funding from the European Union’s Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.
target indicators, but that is often because they are the same thing rather than one being a practical mechanism to achieve the other. For Descriptor 1, 4 and 6, the picture is mixed; the initial assessment is only partially consistent with the GES definition and misses out mammals and protected species but does report on a number of seabed and water column habitats that are not addressed by the definitions of GES for Descriptors 1 or 6.

**Identified gaps and plans to address them**

It is evident that data gaps clearly exist. Data and knowledge gaps are mentioned in an ad hoc manner throughout the paper report on the initial assessment.

There are no detailed plans presented of how these gaps will be addressed.

**Recommendations**

Lithuania should:

i. Strengthen methodology for the socio-economic analysis allowing assessment of the degradation/restoration costs and MSFD implementation costs/benefit analysis;

ii. Strengthen the GES definition of the biodiversity descriptors which goes beyond what is in existing legislation;

iii. Improve GES definitions including through regional cooperation using the work of the Regional Seas Convention as much as possible focusing on quantitative aspects and baselines, with the aim to make GES measurable, focusing especially on those descriptors assessed as inadequate or partially adequate;

iv. Identify knowledge and information gaps and address these, i.a. through the monitoring programme under the MSFD and research programmes, focusing on those descriptors considered as inadequate or partially adequate;

v. Further develop its approaches to assessing (quantifying) impacts from the main pressures to lead to improved and more conclusive assessment results for 2018;

vi. Ensure that the targets cover all relevant pressures, are SMART and sufficiently ambitious in order to achieve the requirements and timelines of the MSFD;

vii. Improve the consistency between the criteria used in GES, the assessment of the impact and the proposed targets.

**The Netherlands**

**General issues**

**Marine waters**

The Netherlands is part of the North East Atlantic region and Greater North Sea subregion. The Wadden Sea and the estuaries Oosterschelde and Westerschelde have been specifically excluded.
Areas assessed

The assessment area is the Dutch marine waters as a whole. No more specific assessment areas have been defined. There is no indication on aggregation scales.

Regional cooperation

The Netherlands, as a contracting party of OSPAR, describe extensively its regional coordination efforts. There has been a high level of information sharing and coordination for the initial assessment and GES determination but The Netherlands underline that the timelines and ambitious requirements of the MSFD prevented the coordination on GES and setting of targets.

Other features

The Netherlands have used the water account approach for its economic and social analysis of the marine uses and a cost-based approach for assessing the cost of degradation. Fourteen marine uses/activities have not been reported upon and the Netherlands provides explanations in response to the completeness assessment in order to justify these gaps. The Netherlands consider that there is no information gap, but that the information would be updated for the Programme of Measures.

The Netherlands have assessed that the additional government expenditure on the implementation of the marine strategy between 2012 and 2020 will be approximately 26 million euros, mainly for seabed protection, intensifying the policy on marine litter, addressing gaps in knowledge and monitoring.

**DETERMINATION OF GOOD ENVIRONMENTAL STATUS (ART. 9)**

**Strong points**

All the descriptors under the MSFD are covered. Relevant international or EU legislation and OSPAR decisions have been acknowledged.

**Weak points**

GES is defined only at the descriptor level and generally merely reproduces the definitions set in Annex I of the Directive without further specification or quantification. The criteria from the Decision have not been applied for the determination of GES.

For Descriptor 7, reference is made to the possibility to compensate in accordance with the Birds and Habitats Directives. However, this consideration should not be part of determination of GES.

**Overall score**

Descriptor 9 is assessed as partially adequate as it makes reference to Community legislation.

For all other descriptors the determination of GES does not meet the minimum requirements and is assessed as inadequate. No information is provided about baseline or reference points to assess progress towards GES. No reference is made for GES to the Birds/Habitats Directives, Water Framework Directive definitions or OSPAR EcoQOs for the biodiversity descriptors.
**INITIAL ASSESSMENT (ART. 8)**

**Strong points**

Extensive justification is given on gaps in knowledge and information. The assessment of features has identified the relevant predominant habitats, species groups and ecosystems. The reporting of habitats is done sufficiently.

The pathways for introduction of invasive non-indigenous species have been identified.

The Netherlands included data on recreational fisheries and assessed the impacts of fisheries in a qualitative and quantitative manner.

It reports on the level of pressure by contaminants and past trends.

The Netherlands made a judgment on the state of the ecosystem of the North Sea (as being not good although this is not related to their definition of GES).

**Weak points**

Impacts of pressures are not systematical addressed.

There is no judgment made as to the pressure and impact neither of physical damage nor for invasive species.

The Netherlands explained that the Initial Assessment was made prior to defining GES and therefore no judgement is made on the status of the marine waters in relation to GES. However, despite this it states that GES will not be achieved in 2020 for certain descriptors.

**Overall score**

The Initial assessment is assessed as being adequate for Descriptors 1, 3, 7 and 9 thanks to reference to reports on features, pressures and trends.

Descriptor 11 is assessed as inadequate because only qualitative information is provided, even not specific for the Netherlands. All other descriptors are partially adequate since no judgement on the state was made and there was only a limited assessment of impacts.

**ENVIRONMENTAL TARGETS (ART. 10)**

**Strong points**

The targets set for the biodiversity-related descriptors are combined and are consistent as a set. The targets set for Descriptor 3 are ambitious and measureable.

**Weak points**

The Netherlands used the criteria of the Decision to define targets and not GES. They mention that for Descriptors 1, 3, 4, 6 and 10 GES in 2020 is not attainable and for Descriptors 5 and 8 only partially attainable. The targets for 2020 are therefore interim targets setting the course towards GES. The aim is, when GES cannot be reached in 2020, to reach it in 2027.

Not all targets are SMART. Many indicators are still under development. The collective set of targets is unlikely to lead to a reduction of pressures and impacts as they are mainly state-based targets.

The COMMON SENSE project has received funding from the European Union’s Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.
Overall score

Targets related to Descriptors 3 and 7 are adequate thanks to being in line with the Commission objectives and even beyond when aiming at eliminating discards.

The setting of the targets is assessed as inadequate for Descriptors 2 and 11 since they are not measurable or no pressure targets have been defined.

Targets related to Descriptors 1, 4, 6, 8, 9 and 10 are partially adequate, as the targets are not SMART, lack detail, ambition or relate to state.

CONSISTENCY

The overall approach followed by the Netherlands is inconsistent as it defines GES in a generic manner (qualitative) and the environmental targets are used at the criteria level.

The set of targets and indicators is consistent with the impacts (Descriptor 5) or pressures reported in the initial assessment. For Descriptor 10 the linkage between GES and the initial assessment and targets is not made (no targets /assessment on micro-litter).

IDENTIFIED GAPS AND PLANS TO ADDRESS THEM

An extensive justification is provided on identified gaps. Knowledge gaps are identified, notably for the assessment of biodiversity features and in relation to pressures for noise, litter and ocean acidification.

Priority topics have been identified such as to develop indicators for marine ecosystems, related to effects of disturbances; the risk of micro-plastics; the establishment of noise levels and the accumulation of effects on the marine ecosystem. Related to measures, priority is given to cost-effective measures under the Common Fisheries Policy, seabed protection and combating marine litter.

It is not entirely clear how the data and knowledge gaps will be addressed. Mention is made of ongoing OSPAR work and the preparedness by the Netherlands to conduct research in collaboration with national and international institutes and EU and international research programmes.

RECOMMENDATIONS

The Netherlands should:

i. Strengthen methodology for the socio-economic analysis allowing assessment of the degradation/restoration costs and MSFD implementation costs/benefit analysis;

ii. Strengthen the GES definition of the biodiversity descriptors which goes beyond what is in existing legislation;

iii. Improve GES definitions including through regional cooperation using the work of the Regional Seas Convention as much as possible focusing on quantitative aspects and baselines, with the aim to make GES measurable, focusing especially on those descriptors assessed as inadequate or partially adequate;

iv. Address knowledge gaps identified in the initial assessment, i.a. through the monitoring programme under the MSFD and research programmes, focusing on those descriptors considered as inadequate or partially adequate;
v. Further develop its approaches to assessing (quantifying) impacts from the main pressures to lead to improved and more conclusive assessment results for 2018;

vi. Ensure that the targets cover all relevant pressures, are SMART and sufficiently ambitious in order to achieve the requirements and timelines of the MSFD;

vii. Improve the consistency between the criteria used in GES, the assessment of the impact and the proposed targets;

viii. Address the scope of marine waters, as defined in the Directive, through full inclusion of WFD Coastal Waters.

Portugal

General issues

Marine waters

Portugal reports only for its continental sub-division (i.e. mainland waters) and partially for its extended continental shelf area beyond 200nm. There are no reports from the Azores and Madeira islands (Macaronesia).

Areas assessed

Regarding the continental sub-division, Portugal has used various assessment areas depending on the descriptor, based on the geographical boundaries and the specificities of the descriptor. For the extended continental shelf, Portugal chose five areas corresponding to the OSPAR marine protected areas. However, it does not focus specifically on the subsoil and seabed, which is precisely where its competencies lie.

Regional cooperation

Portugal shows efforts to ensure regional coordination, within regional conventions and through bilateral contacts with Spain and France. These are extensively described. Portugal also refers often to OSPAR and ICES background documents, mainly in the initial assessment.

Other features

Portugal has followed a water account approach for its economic and social analysis. The methodology has been comprehensively described for each of the marine sub-divisions. The average level of confidence in the results is high as they are based on statistical and other sources of credible entities. The cost of degradation has been estimated following a cost-based approach. Portugal intends to develop further the analysis of the cost of degradation by the end of 2013 so that the results are available on time for the preparation of the programme of measures.

Determination of Good Environmental Status (Art. 9)

Strong points

Portugal has reported on GES for all descriptors.
Weak points

In general terms the report is unclear with regards to the definition of GES. Moreover, there are insufficient details provided so as to evaluate if and when GES level is achieved.

Overall score

Descriptor 9 is partially adequate since it refers to official levels and is measurable. All the other descriptors are inadequate as they are defined at descriptor level only and lack specificity and baselines.

INITIAL ASSESSMENT (ART. 8)

Strong points

Portugal has made a comprehensive assessment of the relevant types and causes of pressures, physical loss and damage in its marine waters, including microbial pathogens. It provides a detailed description of the assessment of contamination in fish and seafood. Portugal acknowledges that information on the full spatial distribution and intensity of physical loss and damage is not homogeneous and therefore the assessment areas vary depending on the specific indicators and the information available.

Weak points

The main pressures on each seabed habitat type have not been identified. Portugal considers that GES is currently achieved for several descriptors in spite of acknowledging that due to insufficient information it is not possible to draw conclusive judgment on the physical losses and damages.

Overall score

An assessment of underwater noise was not made. Five descriptors have been assessed partially adequate (Descriptors 3, 5, 7, 8 and 9) because of lack of information on impacts. The remaining descriptors are assessed as adequate.

ENVIRONMENTAL TARGETS (ART. 10)

Weak points

Portugal has in many cases defined targets as plans to address information and data gaps or to increase the knowledge rather than as targets defined to reach GES. Portugal has set a limited number of specific targets and, most importantly, has not defined specific environmental targets for the biodiversity descriptors.

Overall score

The descriptors for which Portugal has defined targets are assessed as being inadequate (Descriptor 8, 9, 10, 11) as environmental targets to monitor progress towards GES have not been defined. Descriptor 3 is partially adequate.

CONSISTENCY

The approach used by Portugal for defining GES and setting targets is inconsistent. GES is defined in general terms and at high level and targets are missing.
IDENTIFIED GAPS AND PLANS TO ADDRESS THEM

Portugal discusses data and knowledge gaps in a very comprehensive manner. Logically, the extended continental shelf is the area where information is most scarce. Many targets aim at addressing data and knowledge gaps through research and monitoring. However, they are very general and are not time-bound. Several gaps in knowledge have no specific plans to address the problems.

RECOMMENDATIONS

Portugal should:

i. Strengthen the GES definition of the biodiversity descriptors which goes beyond what is in existing legislation;

ii. Improve GES definitions including through regional cooperation using the work of the Regional Seas Convention as much as possible focusing on quantitative aspects and baselines, with the aim to make GES measurable, focusing especially on those descriptors assessed as inadequate or partially adequate;

iii. Address knowledge gaps identified in the initial assessment, i.a. through the monitoring programme under the MSFD and research programmes, focusing on those descriptors considered as inadequate or partially adequate;

iv. Ensure that the targets cover all relevant pressures, are SMART and sufficiently ambitious in order to achieve the requirements and timelines of the MSFD;

v. Improve the consistency between the criteria used in GES, the assessment of the impact and the proposed targets.

Romania

GENERAL ISSUES

Marine waters

Romania’s marine waters were delineated according to OU 71/2010, which transposes into national law the provisions of the MSFD. Therefore it is understood that the marine waters extend from the 1 NM line to the outer limit of the EEZ. Coastal waters and transitional waters were delineated according to the WFD. For both of them, the landward boundary is represented by the shoreline and the offshore limit is represented by the 1 NM line. Romania has included transitional waters in the scope of its MSFD reporting while transitional waters are not included in the scope of Article 3(1) of the MSFD.

Areas assessed

Romania has defined three assessment areas for the purposes of MSFD reporting, which it uses quite systematically for the initial assessment and in certain cases for the definition of GES and for the environmental targets as well. The three areas are: “Coast”, “Transitional” and “Marine”.

GES definitions and targets are defined for the whole of Romania’s marine waters together, with no distinction for specific assessment areas. Romania has made no aggregated judgements in relation to GES nor has it defined aggregation rules.
Regional cooperation
Romania mentions an agreement between the Ministries of Environment and Water of Bulgaria and Romania in order to discuss their obligations under the MSFD but no details on actual BG/RO cooperation are given.

There are very few references to cooperation at regional (Black Sea) level or to Bucharest Convention documents, with the notable exception of Descriptor 3, where most of the proposed targets are at regional level.

Romania reports poor communications as one of the coordination problems but it is not clear whether it means at regional level or at bilateral level with Bulgaria.

Other features
The method used for the economic and social analysis of marine uses is the water accounts approach. Romania refers to the recommendations of WG ESA in the introduction to the ESA chapter in the initial assessment paper report. The activities described include industry, ports, tourism, aquaculture and fisheries, offshore structures, oil and gas exploitation, shipping, waste disposal.

The analysis of the cost of degradation is undertaken using the cost-based approach. As explained by Romania in the reporting sheet, the degradation costs were assessed based on the costs of the measures adopted to protect the marine environment.

**DETERMINATION OF GOOD ENVIRONMENTAL STATUS (ART. 9)**

**Strong points**
For the descriptors where this was done, GES description is consistent with relevant EU legislation such as the Habitats Directive and the Water Framework Directive. In the cases where some data were available (Descriptor 1, 5), there was a good effort to define GES.

**Weak points**
GES was not defined for Descriptors 4, 6, 7, 9, 10 and 11.

There is no systematic use of the 2010 Commission Decision criteria and indicators and in most of the cases no threshold values and baselines are provided. Thus, the GES definitions are not measurable and in some cases non-committal (“GES could be defined as”).

**Overall score**
Even in the cases where GES was defined (Descriptor 1, 2, 3, 5, 8), they were considered inadequate due mainly to a lack/uncertainty concerning the baseline/thresholds and not covering all the Decision criteria.

**INITIAL ASSESSMENT (ART. 8)**

**Strong points**
Considerable effort to consolidate and present an assessment related to biodiversity, non-indigenous species, fisheries, contaminants and eutrophication.
Weak points
Absence of initial assessment for several descriptors (Descriptor 9, 10, 11) and very limited assessment for Descriptor 7.

Overall score
Out of the provided assessments the ones for contaminants, eutrophication, fish and non-indigenous species are considered partially adequate (Descriptor 2, 3, 5, 8) and the others inadequate. Data and knowledge gaps are mentioned only sporadically in the initial assessment report. Information gaps are not discussed in a synthetic manner and there are no plans presented of how these gaps will be addressed. Few judgments are made on the current status in relation to GES.

ENVIRONMENTAL TARGETS (ART. 10)

Strong points
Considerable effort to set quantitative targets, where data was available (Descriptor 1, 3, 5, 8).

Weak points
No targets defined for Descriptors 2, 4, 6, 7, 9, 10, 11.

In most of the cases, no threshold values and baselines are provided and the targets do not cover the different pressures and impacts identified in the initial assessment.

The role of the associated indicators (i.e. for assessing the achievement of the environmental targets) is not always clear.

For Descriptors 5 and 8 there are different targets in the reporting sheets and in the paper report (much less and more general in the paper report, for Descriptor 5 exclusively on pressures).

Overall score
Targets related to Descriptors 1 and 8 are partially adequate; although they are not always quantitative, detailed and time-related, they are realistic and concrete.

Targets on Descriptor 3 are considered inadequate because it is not clear how they relate to MSY reference points and there is no clear timeline for achieving them.

CONSISTENCY

Only for Descriptors 1, 3, 5 and 8 is the information provided about GES, targets and initial assessment sufficient to formulate comments about consistency.

The approach followed in the assessment of pressures and impacts and the definition of GES and the setting of environmental targets is in general terms consistent, with the notable exception of Descriptor 3, where stock status seems to be assessed as being at GES while considerable reduction of fishing effort is reflected in the targets: it is not clear on which advice/arguments the targets are based.

There are many inconsistencies between the reporting sheets and the paper report (in the level of details and the information reported).
IDENTIFIED GAPS AND PLANS TO ADDRESS THEM

Data and knowledge gaps are mentioned only sporadically in the initial assessment report. Information gaps are not discussed in a synthetic manner and there are no plans presented of how these gaps will be addressed.

RECOMMENDATIONS

Romania should:

i. Strengthen the GES definition of the biodiversity descriptors which goes beyond what is in existing legislation;

ii. Improve GES definitions including through regional cooperation using the work of the Regional Seas Convention as much as possible focusing on quantitative aspects and baselines, with the aim to make GES measurable, focusing especially on those descriptors assessed as inadequate or partially adequate;

iii. Identify knowledge and information gaps and address these, i.a. through the monitoring programme under the MSFD and research programmes, focusing on those descriptors considered as inadequate or partially adequate;

iv. Further develop its approaches to assessing (quantifying) impacts from the main pressures to lead to improved and more conclusive assessment results for 2018;

v. Ensure that the targets cover all relevant pressures, are SMART and sufficiently ambitious in order to achieve the requirements and timelines of the MSFD;

vi. Improve the consistency between the criteria used in GES, the assessment of the impact and the proposed targets;

vii. Address the scope of marine waters, as defined in the Directive, through exclusion of WFD Transitional Waters.

Slovenia

GENERAL ISSUES

Marine waters

Slovenia’s marine waters are part of the marine sub-region of the Adriatic Sea. No formal subdivisions have been made.

Areas assessed

Slovenia’s initial assessment, characteristics of GES and associated targets and indicators have been developed for Slovenia’s marine waters as a whole.

Regional cooperation

Slovenia is party to the Barcelona Convention. Slovenia reports participation in five meetings at regional level for coordination of approaches for the initial assessment and definition of GES, with Italy and Croatia, and on the establishment of environmental targets, with Italy.
Other features

The economic and social analysis of marine uses for Slovenia has been undertaken using the water accounts approach and Slovenia has followed an ecosystem services approach to evaluating the cost of degradation. For both assessments, a number of economic sectors related to the use of marine waters are listed and a qualitative and quantitative description of each activity is provided.

**Determination of Good Environmental Status (Art. 9)**

**Strong points**

All the descriptors under the MSFD are covered.

Slovenia has set a threshold for indicator 3.3.3 (for all commercial species the 95 percentile of the fish length distribution is stable or rising) which is considered a best practice.

**Weak points**

The definition of GES is generally vague or not specific, with the exception of Descriptor 5.

The approach used to define GES varies. For some descriptors, GES is defined at descriptor level (Descriptor 7, 9, 10), in other cases at both descriptor and criteria level (Descriptor 1, 4, 5, 8) and in the remaining cases at criterion level only (Descriptor 2, 6, 11). Descriptor 3 is defined only at indicator level.

The list of species selected by Slovenia as covered by their GES definition includes only protected/listed habitats; it does not cover fish or cephalopods and does not address all marine species equally.

**Overall score**

Seven GES definitions are considered as partially adequate (Descriptor 1, 3, 5, 8, 9, 10, 11) since it is consistent with the Commission Decision but either are qualitative or partially defined or lack thresholds or reference values.

For the remaining descriptors (Descriptor 2, 4, 6, 7), the determination of GES is assessed as inadequate, since it does not meet the minimum requirements and is lacking a measurable baseline or reference points to assess progress towards GES.

**Initial Assessment (Art. 8)**

**Strong points**

The initial assessment is mainly descriptive but there is a fair attempt to quantify many elements (with the exception of Descriptor 8) and to make a judgement on the status of the marine environment in relation to GES (i.e. Descriptor 1, 2, 4, 5, 9).

Slovenia has performed additional studies for the initial assessment on non-indigenous species (Descriptor 2). It has also reported on microbial pathogens (Descriptor 9) and the assessment is considered adequate.

**Weak points**

Judgements on the current status in relation to GES are not consistently made.
Overall score

Three initial assessments for the pressure/impact are considered as adequate (Descriptor 5, 10, 11) thanks to a good qualitative judgment made in relation to GES on trends, the provision of thresholds and baselines, identification of main causes of pressure and addressing the impacts and provision of substantial information on knowledge and data gaps and plans to address them. For Descriptors 10 and 11, the current state of knowledge is taken into consideration for the overall score.

Six initial assessments for the pressure/impact are considered as partially adequate (Descriptor 1, 2, 3, 4, 6, 9) since the information provided is limited and mainly qualitative and there is a lack of judgement in relation to GES as well as a limited assessment of impacts.

Only the initial assessments for Descriptors 7 and 8 are considered as inadequate, mainly due to limited and no quantifiable information and the lack of judgement of status in relation to GES.

ENVIRONMENTAL TARGETS (ART. 10)

Strong points

Slovenia has set environmental targets for all descriptors. For some descriptors, the targets are divided into “environmental objectives” (focused on the reduction of pressures or impacts) and “operational objectives” (e.g. focused on the development of indicators or the gathering of information).

Slovenia has included an environmental target addressing recreational fisheries.

Weak points

Many of the environmental targets are interim ones, with various elements still to be developed e.g. method for assessment, baseline and proportion of areas affected.

For Descriptors 3, 6, 7 and 9, some targets (in terms of proportion or year) are not defined but rather Slovenia has introduced values ‘x’ to be completed later.

There is also a lack of thresholds/reference conditions for environmental targets and a significant number of them are only interim targets.

Some environmental targets (Descriptor 2, 3, 7, 11) are defined in a vague and general way, sometimes phrased as a GES definition.

Impacts from pressure are not sufficiently reported on.

Overall score

Only the target related to Descriptor 5 is considered adequate, as it is specific, measurable, achievable and realistic, impact-related, ambitious and consistent.

Targets related to Descriptors 1, 2, 8, 9 and 10 are partially adequate as they are insufficiently specific to be SMART, baselines are vaguely defined or there are no thresholds.

The targets of all the remaining descriptors (Descriptor 3, 4, 6, 7, 11) are considered as inadequate, mainly because they are not operational, not measurable, non-committal and lack threshold values and baselines.
The approach followed by Slovenia in the assessment of pressures and impacts and the definition of GES and the setting of environmental targets is in most cases not fully consistent.

**Identified gaps and plans to address them**

There is a systematic identification of knowledge and data gaps combined with several surveillance environmental targets to address these (i.e. Descriptor 5, 8).

The plans to address these gaps are usually quite vague and without details of timescales or responsibilities.

**Recommendations**

Slovenia should:

i. Strengthen the GES definition of the biodiversity descriptors which goes beyond what is in existing legislation;

ii. Improve GES definitions including through regional cooperation using the work of the Regional Seas Convention as much as possible focusing on quantitative aspects and baselines, with the aim to make GES measurable, focusing especially on those descriptors assessed as inadequate or partially adequate;

iii. Address knowledge gaps identified in the initial assessment, i.a. through the monitoring programme under the MSFD and research programmes, focusing on those descriptors considered as inadequate or partially adequate;

iv. Further develop its approaches to assessing (quantifying) impacts from the main pressures to lead to improved and more conclusive assessment results for 2018;

v. Ensure that the targets cover all relevant pressures, are SMART and sufficiently ambitious in order to achieve the requirements and timelines of the MSFD;

vi. Improve the consistency between the criteria used in GES, the assessment of the impact and the proposed targets.

**Spain**

**General issues**

**Marine waters**

Spain’s marine waters are part of two regions: the Mediterranean and the North-East Atlantic, covering two sub-regions: the Bay of Biscay and the Iberian coast and Macaronesia in which the Canaries are located.

**Areas assessed**

Within these regions and sub-regions, Spain has determined the following five sub-divisions for the purposes of the implementation of the MSFD:

- The North Atlantic subdivision
The South Atlantic subdivision
- Estrecho and Alborán subdivision (Mediterranean South part)
- The Levantino-Balear subdivision (Mediterranean North part)
- The Macaronesia (Canary) subdivision

For several descriptors, Spain has defined specific aggregation rules that are described in the relevant sections.

Some differences within GES definitions have been identified across sub-divisions, however, the reasons for these differences are not always clear.

Regional cooperation
Spain is party to OSPAR and the Barcelona Convention. Activities, structures and efforts for regional coordination, within both regional conventions are extensively described. The general document for the marine strategy also presents general and particular targets set by the relevant conventions. It also refers to ACCOBAMS and the London Convention.

Other features
In addition to targets for each of the descriptors, Spain has set generic targets which apply to all descriptors at a time in each of the sub-divisions. These relate to monitoring systems, public participation and access to information as well as the need to coordinate across competent authorities and stakeholders. Although very general, they set some basic principles which complement the more specific targets established by descriptor.

Spain has followed a water account approach for its economic and social assessment. The methodology has been comprehensively described and the analysis done for each of the marine sub-divisions. The cost of degradation has been estimated following a cost-based approach.

DETERMINATION OF GOOD ENVIRONMENTAL STATUS (ART. 9)

Strong points
Spain addresses GES for all descriptors at the criteria level and sometimes at indicator level. GES has been further specified for the subdivisions. The definition of GES is often very detailed, expressed in a quantifiable manner and thoroughly described in accompanying text.

Spain applied methods for the North East Atlantic in the Mediterranean when these methods not available there.

Aggregation rules are defined for a number of GES descriptors (Descriptor 5, 8, 9).

Weak points
The manner of how to aggregate GES for the many different species, habitats and ecosystems is not defined.

The level of fishing mortality which is set as GES for Descriptor 3 is set below the required $F_{MSY}$. Descriptor 4 misses thresholds and baselines and a specification of the main trophic groups to be considered.

The COMMON SENSE project has received funding from the European Union’s Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.
The description of GES for Descriptors 10 and 11 is very generic and qualitative and lacks specification.

**Overall score**

Descriptors 1 and 9 are assessed as adequate (for both Atlantic and Mediterranean Sea).

Descriptors 2, 5, 6, 7 and 8 are assessed as partially adequate as no limit to new introduction concentrations (Descriptor 2), threshold values and baselines are not provided (Descriptor 5), the condition of the sea-floor habitats misses specification on ecosystem elements (Descriptor 6), as the scale of change is not defined (Descriptor 7) and the applied methodology has not yet agreed reference values (Descriptor 8).

Descriptors 3, 4, 10 and 11 are assessed as inadequate as they are below the minimum requirement (Descriptor 3) or lack specification (Descriptor 4, 10, 11).

**Initial assessment (Art. 8)**

**Strong points**

Extensive information is provided, which is often also quantitative and specific on the status of the marine environment. Justification is given on gaps in knowledge and information and how to address these gaps.

All relevant pressures have been identified and reported on, including microbial pathogens.

For several descriptors (e.g. Descriptor 3, 5, 8, 9), Spain has made an assessment of the current status of their marine waters using the characteristics defined for their GES which shows that GES for Descriptor 3 and in coastal areas for Descriptors 5 and 8 is not met everywhere.

The assessment of features is comprehensive and covers all major habitat zones (although water column habitats receive only limited attention).

**Weak points**

Spain reported by means of many extensive reports which misses a comprehensive structure and lacks summaries and clarity on conclusions.

Impacts of pressures are not systematical reported on.

**Overall score**

The initial assessment is assessed as being adequate for all descriptors, except for Descriptor 2 which is assessed partially adequate due to missing information on impacts and trends, Descriptor 7 because the description of habitats potentially affected by changes is not complete and no trend is provided, and Descriptor 5 (in the Mediterranean Sea) due to limited information in terms of nutrient and organic loads to the sea and not all impacts are adequately covered.

**Environmental targets (Art. 10)**

**Strong points**

Spain provides a wide range of targets, addressing the pressures, the state or the impacts. It has defined a large set of biodiversity targets which can be applied to several descriptors. They are detailed and specific.
The targets for Descriptor 7 are extensive: there are six environmental targets with associated indicators.

The environmental targets and associated indicators have a robust legal status.

**Weak points**

In contrast to their comprehensiveness, most environmental targets are not quantified, miss thresholds or are not measurable.

**Overall score**

Descriptor 7 is assessed as adequate. Descriptor 11 as inadequate as it is more an expression of GES and not specific enough. All other descriptors have been assessed partially adequate with regard to the environmental targets since they are described (extensively) qualitative and not quantified or miss thresholds.

**Consistency**

Overall, the approach to set GES and targets and to undertaking the initial assessment is consistent across descriptors and sub-divisions. For Descriptors 3, 5, 8 and 9 Spain has made an assessment of the current status of their marine waters using the characteristics defined for their GES although for Descriptor 5 not all sources or pressures are covered.

**Identified gaps and plans to address them**

Spain discusses data and knowledge gaps in a very comprehensive manner, for each descriptor. Many environmental targets include targets aimed at addressing data and knowledge gaps through research and monitoring.

**Recommendations**

Spain should:

i. Improve GES definitions including through regional cooperation using the work of the Regional Seas Convention as much as possible focusing on quantitative aspects and baselines, with the aim to make GES measurable, focusing especially on those descriptors assessed as inadequate or partially adequate;

ii. Ensure that the targets cover all relevant pressures, are SMART and sufficiently ambitious in order to achieve the requirements and timelines of the MSFD.
**Sweden**

**GENERAL ISSUES**

**Marine waters**
Sweden’s marine waters are part of the North East Atlantic Ocean and the Baltic Sea regions. Sweden has made no formal subdivision of the marine areas.

**Areas assessed**
It has defined some assessment areas in its legislation, two in the North Sea and nine in the Baltic. One additional assessment area (Oresund) seems to be part of the two regions.

**Regional cooperation**
Sweden is part of both HELCOM and OSPAR Regional Sea Conventions and also held bilateral meetings with Denmark, Norway, Finland and Estonia in order to develop its MSFD reporting under articles 8, 9 and 10.

**Other features**
Sweden has given a robust legal status to its GES definitions, environmental targets and indicators by incorporating them in legislation. This can be singled out as a good practice.

The economic and social analysis of marine uses carried out by Sweden uses a combination of the ecosystem services approach and the water accounts approach.

After an analysis of the link between driving forces and ecosystem services, three ecosystem services have been selected for an in-depth analysis: biodiversity, reduced eutrophication and aesthetic values. The analysis is mainly qualitative but socio-economic indicators identified in the North Sea and Baltic Sea regions (employment, sales, completed treatment value, wages, and in some cases social indicators) have also been analysed as a complement to the ecosystem approach. Economic data from 2009 has been provided for all reported activities (2010 for tourism and recreation). The marine part of the tourism sector was determined using GIS analysis.

For the analysis of the cost of degradation, the ecosystem services approach is also used. In addition, Sweden has analysed two future scenarios (2020 and 2050) and compared the impacted results with reference conditions.

**DETERMINATION OF GOOD ENVIRONMENTAL STATUS (ART. 9)**

**Strong points**
Overall, Sweden’s GES definitions are set in comprehensive manner, covering all descriptors, and also at the level of criteria. They take into account existing EU law and other standards from the relevant Regional Sea Conventions.

For Descriptor 2, Genetically Modified Organisms are included in the non-indigenous species GES definition.
Weak points

However, all too often, the GES set remains difficult to measure, as indicators are not yet operational, or definitions remain too vague. For the biodiversity-related descriptors, for instance, the GES definition is too unspecific, not referring to baselines or thresholds. In addition, Sweden rarely goes beyond existing standards.

Overall score

The GES definition for Descriptor 4 is considered adequate.

The GES definitions for Descriptors 1, 2, 3, 5, 8, 9, 10 and 11 are partially adequate, as they are sometimes incomplete or too imprecisely quantified.

The GES definition for Descriptor 7 is inadequate as no measurable indicators can be derived from this definition and no baseline or thresholds are provided.

INITIAL ASSESSMENT (ART. 8)

Strong points

On the whole, the initial assessment gives a good impression of the main pressures affecting Sweden’s marine waters. They have been identified and reported on the information available in OSPAR and HELCOM, making extensive use of this information.

Weak points

Some descriptors however are more poorly covered; this in particular the case for Descriptor 7 (hydrographical changes) where the initial assessment does not reflect sufficiently the information available in OSPAR and HELCOM on the topic. Overall, quantitative assessments are often missing, as well as judgments on status and trends.

Overall score

The initial assessment is considered adequate for Descriptor 3 in the North East Atlantic and Descriptor 5 in the Baltic Sea. Descriptor 7 is deemed inadequate because it does not reflect the existing level of knowledge. Descriptor 11 is not addressed. The other descriptors are partially adequate since the assessment is mainly qualitative and the assessment of impacts is limited.

ENVIRONMENTAL TARGETS (ART. 10)

Strong points

A strong point of Sweden’s targets is that they are defined as Environmental Quality Standards and incorporated into their legislation. There is a strong connection with existing EU laws and regional standards, whether from OSPAR, HELCOM or both.

Weak points

The lack of applicable threshold values remains, however, an issue for many descriptors, hampering measurability, with many indicators and targets still in need of further development, by 2014 or sometimes even only by 2018. The targets not all address the pressures.
Overall score

The targets for Descriptors 1 and 4 are considered inadequate (they focus on fish and do not address mammals and birds or specific habitats). Descriptor 7 is also inadequate as it does not address all relevant aspects, such as sediment transport. For Descriptor 9 Sweden explains that the targets covering Descriptor 8 are also relevant for Descriptor 9 which is inadequate because of the different substances concerned.

Targets for Descriptor 2, 3, 5, 6, 8 and 10 are assessed as partially adequate, mainly based on their lack of measurability. There are no targets for Descriptor 11.

CONSISTENCY

A good practice from Sweden is that it makes links for targets between various descriptors, thereby addressing their inter-linkages. Otherwise, GES definitions are overall consistent with targets, though in some instances, they are less consistent with the initial assessment.

IDENTIFIED GAPS AND PLANS TO ADDRESS THEM

Data and knowledge gaps are identified in a systematic way and described in detail. Specific information gaps have been identified, in particular, in the field of biodiversity, non-indigenous species, commercial fish, sea-floor integrity, hydrographical changes, marine litter and underwater noise.

Sweden has included an analysis of the development needs of a number of indicators for GES (and targets), and plans to address these gaps are referred to, focusing on work in the Regional Sea Conventions and at EU level, as well as on additional monitoring needs.

RECOMMENDATIONS

Sweden should:

i. Strengthen the GES definition of the biodiversity descriptors which goes beyond what is in existing legislation;

ii. Improve GES definitions including through regional cooperation using the work of the Regional Seas Convention as much as possible focusing on quantitative aspects and baselines, with the aim to make GES measurable, focusing especially on those descriptors assessed as inadequate or partially adequate;

iii. Further develop its approaches to assessing (quantifying) impacts from the main pressures to lead to improved and more conclusive assessment results for 2018.

United Kingdom

GENERAL ISSUES

Marine waters

The UK's marine waters fall within the North-East Atlantic Ocean region and within the sub-regions known as the Celtic Seas and the Greater North Sea, and in the Mediterranean Sea region within the Western Mediterranean Sea subregion.
Their marine waters in the NE Atlantic region include coastal waters, as defined under the Water Framework Directive, and a Renewal Energy Zone (REZ). An area of Continental Shelf beyond the REZ (Hatton Rockall area) is also included, whilst other such areas await the outcomes of UNCLOS processes. In the Mediterranean they have defined marine waters out to 3nm of Territorial Seas around Gibraltar.

There are areas of overlap and gaps with Ireland's marine waters at both the coastal boundaries with Ireland and the median line boundary in the Irish Sea and Celtic Sea. The marine waters around Gibraltar are also require further clarification.

**Areas assessed**

For the purposes of reporting on MSFD Articles 9 and 10 the UK has defined GES and targets for the UK marine waters as a whole\(^{356}\), but reflecting significant biogeographical differences if present. For MSFD Article 8, the UK has used eight biogeographically-defined assessment areas for the North Sea/Celtic Seas subregions.

The UK indicates that the boundaries between the Celtic Seas and Greater North Sea subregions are still under consideration.

**Regional cooperation**

The UK is party to the OSPAR Convention. Efforts for regional coordination within the regional convention, as well as bilaterally with neighbouring countries, are extensively described.

**Other features**

The UK has used the ecosystem services approach for their economic and social assessment and to estimate the costs of degradation, with its assessment undertaken at the UK level. It notes that it will develop its data at a scale more suited to MSFD implementation in time for the next (2018) assessment.

**DETERMINATION OF GOOD ENVIRONMENTAL STATUS (ART. 9)**

**Strong points**

The UK addresses GES for all descriptors, and often includes some criterion-level details.

They have systematically used existing EU requirements and standards and place a strong emphasis on work and standards from the RSC (OSPAR).

They have incorporated the dynamic nature of the ecosystem into their determination of GES for Descriptor 1, acknowledging that natural and climatic changes over time may necessitate modifications of GES definitions.

For Descriptors 8 and 9, concentrations of contaminants should not increase, even if currently below regulatory maximum levels.

**Weak points**

GES is defined mainly at the descriptor level, but with some elements of the Decision criteria; it is generally only qualitative and therefore not measurable. However, the UK provides further

\(^{356}\) Reporting on Gibraltar was received too late (September 2013) to be considered. The rest of this report therefore refers only to the Greater North Sea and Celtic Seas parts of the UK report.

The COMMON SENSE project has received funding from the European Union’s Seventh Framework Program (Ocean 2013-2) under the grant agreement no 614155.
specifications for GES for Descriptors 1 and 4 by specifically linking its GES definitions to the environmental targets defined under Art. 10.

**Overall score**

Descriptors 1, 2, 3, 4, 5, 7, 8, 9, 10 and 11 are assessed as partially adequate, as they either do not fully address the Decision criteria or they lack key elements or specificity.

Descriptor 6 is assessed as inadequate, as it does not cover all criteria or define its terms or baseline and is not specific enough to be measurable.

**INITIAL ASSESSMENT (ART. 8)**

**Strong points**

The initial assessment is based largely on a recent (2010) comprehensive assessment of UK waters, which has thoroughly assessed most aspects required by MSFD and derived judgements on environmental status (albeit not in relation to the UK’s definition of GES).

On the whole, the main pressures and their sources have been identified and reported on.

**Weak points**

There is a lack of quantification of physical disturbance pressures despite availability of suitable data.

There is limited assessment of impacts from certain pressures (e.g. nutrient enrichment), particularly in a quantitative manner, and few conclusive judgments on current status.

**Overall score**

The initial assessment is assessed as being adequate for Descriptors 1, 2, 4, 8, 10 and 11, with generally good coverage of the main pressures and their sources; assessments of impacts and overall status are however more limited.

For Descriptors 3, 5, 6, 7 and 9, the initial assessment is considered partially adequate, with several key elements missing or poorly assessed (e.g. sea-floor damage, organic matter enrichment, seafood contamination) and limited assessments of impacts.

**ENVIRONMENTAL TARGETS (ART. 10)**

**Strong points**

Substantial detail or clear specification is provided for Descriptors 1, 3, 4, 5, 6, 7 and 11.

**Weak points**

The targets for Descriptors 1, 3 (partially), 4 and 6 are effectively expressions of GES and would better sit under Art. 9. Many provide normative definitions of GES and require more specific quantitative thresholds to be fully measurable.

Environmental targets are often not sufficiently clear or SMART to be measurable.
Overall score

The targets for Descriptor 1, 3, 4, 5, 6, 7 and 11 have been assessed as adequate although targets for Descriptors 1, 3, 4, 6 are, however, mostly state-oriented with limited reference to reductions in specific pressures and impacts.

The targets for Descriptors 8, 9 and 10 have been assessed as partially adequate since they lack some specificity or coverage (e.g. contaminants in water) or are not sufficiently focused on reductions in pressures and impacts (e.g. surveillance targets for litter).

The targets for Descriptors 2 are considered inadequate as they lack specification and are therefore not measurable.

Consistency

There is a good level of consistency between GES, the initial assessment and the environmental targets for most descriptors.

Identified gaps and plans to address them

As a rule, extensive justification/explanation is provided on gaps in data/knowledge and assessment methodology, accompanied most of the time by plans to close these gaps, albeit generally rather vague.

Recommendations

The UK should:

i. Strengthen the GES definition of the biodiversity descriptors which goes beyond what is in existing legislation;

ii. Improve GES definitions including through regional cooperation using the work of the Regional Seas Convention as much as possible focusing on quantitative aspects and baselines, with the aim to make GES measurable, focusing especially on those descriptors assessed as inadequate or partially adequate;

iii. Further develop its approaches to assessing (quantifying) impacts from the main pressures to lead to improved and more conclusive assessment results for 2018.
ANNEX VI TECHNICAL ASSESSMENT OF THE MSFD 2012 OBLIGATIONS, SPAIN

All the information included in this Annex is extracted from the document “Milieu Ltd Consortiu. Technical Assessment of the MSFD 2012 obligations, Spain. 7 February 2014”.

Scope of marine waters

The Spanish marine waters are part of two regions: the Mediterranean and the North East Atlantic. The latter covers two sub-regions: the Bay of Biscay and the Iberian coast and Macaronesia (the Canary Islands).

Assessment areas and aggregation scales

Within these regions and sub-regions, Spain has determined the following five sub-divisions for the purpose of the implementation of the MSFD:

1. The North Atlantic division: it includes the marine waters under Spanish jurisdiction between the northern limit of the territorial waters between Spain and Portugal and the limit of the territorial waters between Spain and France in the Bay of Biscay. It extends over four autonomous regions: Galicia, Asturias, Cantabria and the Basque Country, and seven provinces: A Coruña, Pontevedra, Lugo, Asturias, Cantabria, Guipúzcoa and Vizcaya.

2. The South Atlantic division: it includes marine waters between the limit of the territorial waters between Spain and Portugal in the Gulf of Cadiz and the meridian passing through Cape Spartel (Morocco). It extends over two provinces of the Autonomous Community of Andalusia Cadiz and Huelva.

3. Estrecho and Alborán: it includes the marine waters under Spanish jurisdiction between the meridian passing through Cape Spartel and an imaginary line oriented 128° to the meridian passing through Cape Gata, and the Spanish marine waters in the area of Ceuta, Melilla, Chafarinas Islands, the islet Perejil, Peñones de Vélez de la Gomera and Alhucemas and Alboran Island. It stretches over four provinces of the Autonomous Community of Andalusia Almeria, Granada, Malaga and Cadiz and the autonomous cities of Ceuta and Melilla.

4. The Levantino-Balear division: it includes the Spanish marine waters between the imaginary line oriented 128° to the meridian passing through Cape Gata and the limit of the territorial waters between Spain and France in the Gulf of Lions. The division extends over five Autonomous Communities (Catalonia, Valencia, Balearic Islands, Murcia and Andalusia) and nine provinces (Barcelona, Girona, Tarragona, Alicante, Castellón, Valencia, Balearic Islands, Murcia and Almeria).

5. The Macaronesia (Canary) division: it includes the Spanish marine waters around the Canary Islands. It extends over two provinces of the Autonomous Community of the Canary Islands: Las Palmas and Santa Cruz de Tenerife.

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The following table summarizes the assessment carried out by Spain:

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<tr>
<th>Keys</th>
<th>Meaning</th>
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<tr>
<td>+++</td>
<td>Good practice (can be attributed to one individual criterion)</td>
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| Mediterranean | | | | |
|---------------|---------------|---------------|---------------|
| **D5**        | +             | -             | +             |
| - GES definition covers all the criteria of the 2010 Commission Decision | - More limited information on impacts and loads to the sea |
| - Good link with the MSFD and MED POL |
| - Baselines/thresholds for changes in phytoplankton communities and species shifts in floristic composition are not provided |
| **D8**        | +             | +             | +             |
| - GES defined at criteria level but coverage of criterion B.2 only partial (no coverage of acute pollution events) |
| - Use of OSPAR EAC and EcoQoAs as |
| - Considerable information on most indicators (qualitative and quantitative) |
| - Trends are provided for only some indicators |
| The judgement that GES is achieved does not seem to reflect the real situation |
| **D10**       | -             | ++            | +             |
| - GES defined only at descriptor level |
| - Lack of specification (e.g. threshold values used in the initial assessment) |
| - No reference to UNEP/MAP |
| - Qualitative and quantitative assessment made |
| - Different types of litter reported on |
| - Spatial distribution of litter |
| - Reference conditions to be used for assessment of current status provided |
| - No aggregated judgement made because of lack of data |
| **D11**       | -             | ++            | -             |
| - GES defined only descriptor level |
| - Slightly different from Annex I MSFD which means increase in scope of the Spanish GES definition in comparison to the Commission Decision |
| - Lack of threshold or reference values |
| - Pressures identified |
| - Adequate level of details provided considering data available |
| - Acknowledgment of gaps and details provided on how to remedy the gaps |
| - Designed to achieve pressure reduction, but predominantly from point sources |
| - Not sufficiently targeted or ambitious to reduce levels of a individual pressures or impacts |
| - Qualitative targets |
| - Targets are potentially measurable and have associated indicators |
| - Only three are quantified with thresholds and baselines |
| - Targets specific for marine litter focus on reducing input of litter from various sources |
| - Potentially measurable but lack of threshold values |
| - No target on the impact of litter on ecosystem components because of lack of data |
| - Targets are very general and are rather expression of GES than actual targets focused on controlling human activities |
| - Lack of threshold values and baselines |