

Common Understanding of (Initial) Assessment, Determination of Good Environmental Status (GES) & Establishment of Environmental Targets (Articles 8, 9 & 10 MSFD)

Status: 22.11.2011

This is a living document which should be revisited and revised due to increased knowledge and/or experiences with the MSFD implementation.

Status box

Title:

Common Understanding of (Initial) Assessment, Determination of Good Environmental Status (GES) and Establishment of Environmental Targets (Art. 8, 9 & 10 MSFD)

Status: Version 6 – 22 November 2011

Background:

Under the MSFD Common Implementation Strategy, a Working Group (WG) on Good Environmental Status (GES) has been initiated in 2009 to assist the development of criteria and methodological standards for good environmental status and address issues of their application by EU Member States. WG GES agreed as a priority for 2010-2011 to develop a common understanding of the main normative concepts of the MSFD (Art. 8, 9 and 10) as basis to assist the application of MSFD in Member States in a comparable and consistent way. WG GES co-lead Germany and a drafting group involving the European Commission and the EU Member States Finland, France, Greece, Romania, Sweden and the UK initiated the development of a common understanding. An early draft has been shared with members of WG GES for commenting. A revised draft was presented to WG GES on 27/28 September with an invitation to EU Member States to comment by 12 October. WG GES agreed that the document should be finalised based on comments received and submitted to MSCG for endorsement, noting that this is a living document and that certain comments require further discussion by Member States and should be addressed in a future update. Subject to minor amendments, MSCG recommended the finalised document to Marine Directors for endorsement.

Marine Directors at their meeting on 8./9.12.2011 endorsed the Common Understanding document as a living document and the work package for further work in 2012/2013.

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1. Objectives.

- 1.1 At the WG GES meeting of 22 October 2010 the need to have a consistent and comparable approach across all marine regions and subregions in determining the characteristics of GES, establishing associated environmental targets to achieve or maintain it, and in assessing our progress towards achieving it, was highlighted. With this in mind, it is essential to develop a common understanding of key aspects pertaining to MSFD implementation. Consequently, this task was included in the WG GES mandate endorsed by the Marine Directors meeting in December 2010.
- 1.2 Specifically this task aims at ensuring a consistent and comparable approach across all marine regions/subregions by Member States with respect to the application of Art. 8 (Assessment on the basis of Annex III of the Directive), Art. 9 (Determination of Good Environmental Status on the basis of Annexes I and III of the Directive), and Art. 10 (Establishment of Environmental Targets, taking into account Annex III and Annex IV of the Directive).
- 1.3 To arrive at a common understanding a proposal was tabled to draft a document providing guidance to Member States on the interpretation of these three Articles. This was also to include descriptive examples, common terminology and a consideration of appropriate scales in time and space. The task was launched by the WG GES co-lead Germany and takes advantage of discussions and developments already ongoing within the Regional Sea Conventions and at a national level, to support the desired consistency at an EU level.
- 1.4 This common understanding should be used as a guide by Member States when implementing the Directive to help ensure a coherent and consistent approach across Articles 8 (assessment), 9 (determination of GES) and 10 (establishment of environmental targets). It attempts to describe the important and common steps in a structured and transparent way, illustrated by specific examples to aid understanding. The contents should not be considered prescriptive but rather should be used to assist in the development and adoption of common approaches as appropriate. The document is intended to apply to all marine regions/subregions, acknowledging that differences exist between regions and that it may not reflect all of these. Member States are urged to take forward as many of the commonalities highlighted in the paper as possible in order to aid the consistent implementation of these Articles at a regional and subregional level.

2. Introduction.

- 2.1 In July 2008, the Marine Strategy Framework Directive (MSFD; 2008/56/EC) came into force. Implementation of the MSFD should deliver an improved understanding and management of pressures and impacts arising from human activity and ultimately result in a reduction in undesirable impacts on the marine environment. This should lead to improved environmental status and resilience of marine ecosystems to counteract natural and human induced changes whilst ensuring the sustainable use of ecosystem goods and services.
- 2.2 The MSFD requires Member States to put in place the necessary measures to achieve or maintain 'Good Environmental Status' (GES) in the marine environment by 2020 at the latest. To reach this overall goal of the MSFD, national Marine Strategies are to be developed and implemented (Art. 5 MSFD) in order, to protect and preserve the marine environment, prevent its deterioration or, where practicable, restore marine ecosystems in areas where they have been adversely affected. Furthermore, inputs into the marine environment are to be prevented and reduced, with a view to phasing out pollution, so as to ensure that there are no significant impacts on, or risks to, marine biodiversity, marine ecosystems, human health or legitimate uses of the sea (Art. 1 (2) MSFD). These Marine Strategies shall apply an ecosystem-based approach to the management of human activities, including adoption of the precautionary principle, and should contribute to the overall coherence and integration of existing EU policies and legislation and the ongoing work of the Regional Sea Conventions.
- 2.3 In developing Marine Strategies, the Directive requires Member States to follow Art. 5(2) MSFD. This includes the preparation, by 2012, of an initial assessment of the marine environment (an assessment of status, pressures, impacts, and socio-economic analysis), a characterisation/ determination of GES and a suite of appropriate environmental targets and associated indicators. By 2014, Member States shall have established fit-for-purpose monitoring programmes and developed (by 2015) and implemented (by 2016) programmes of measures designed to achieve or maintain GES by 2020 (Art. 11 and 13 MSFD).
- 2.4 The Directive requires Member States to determine the characteristics of GES, that is, 'what does GES look like', and to develop environmental targets and associated indicators. These environmental targets and associated indicators should help guide progress towards achieving or maintaining GES. 'Good Environmental Status' shall be determined at the level of marine regions or

subregions (Art. 3(5) MSFD) and Member States shall, in respect of each marine region or subregion, establish a comprehensive set of environmental targets and associated indicators for their marine waters (Art. 10(1) MSFD). Determining GES and setting environmental targets and associated indicators are to be coordinated with other Member States in their marine region or subregion (where practical and appropriate, using regional institutional cooperation structures, including Regional Sea Conventions) and should reflect closely the EU Commission Decision 2010/477/EU of 1 September 2010 on Criteria and Methodological Standards of Good Environmental Status (COM Decision 2010/477/EU).

2.5 Member States are also required to ensure that their Marine Strategies for each marine region or subregion are kept up to date (Art. 17 MSFD) on a six-yearly basis. *Figure 1* highlights this adaptive management cycle, starting with the initial assessment (Art. 8 MSFD), the determination of GES (Art. 9 MSFD), and the establishment of environmental targets (Art. 10 MSFD). This six-yearly management cycle means there will be regular opportunities for Member States to review the suitability and effectiveness of their determination of GES, their environmental targets and indicators, and their programmes of measures. The next assessment of environmental status is required in 2018 and will provide the basis for such a review.

2.6 EU Member States are due, in respect of each marine region or subregion, to notify their determination of GES (Art. 9(2) MSFD) and their environmental targets and associated indicators (Art. 10(2) MSFD) to the European Commission, within three months of their establishment. Art. 12 MSFD provides that: “[...] *the Commission shall assess whether, in the case of each Member State, the elements notified constitute an appropriate framework to meet the requirements of this Directive and may ask the Member State concerned to provide any additional information that is available and necessary. In drawing up those assessments, the Commission shall consider coherence of frameworks within the different marine regions or subregions and across the Community. Within six months of receiving all those notifications, the Commission informs Member States concerned whether, in its opinion, the elements notified are consistent with this Directive and provides guidance on any modifications it considers necessary.*”

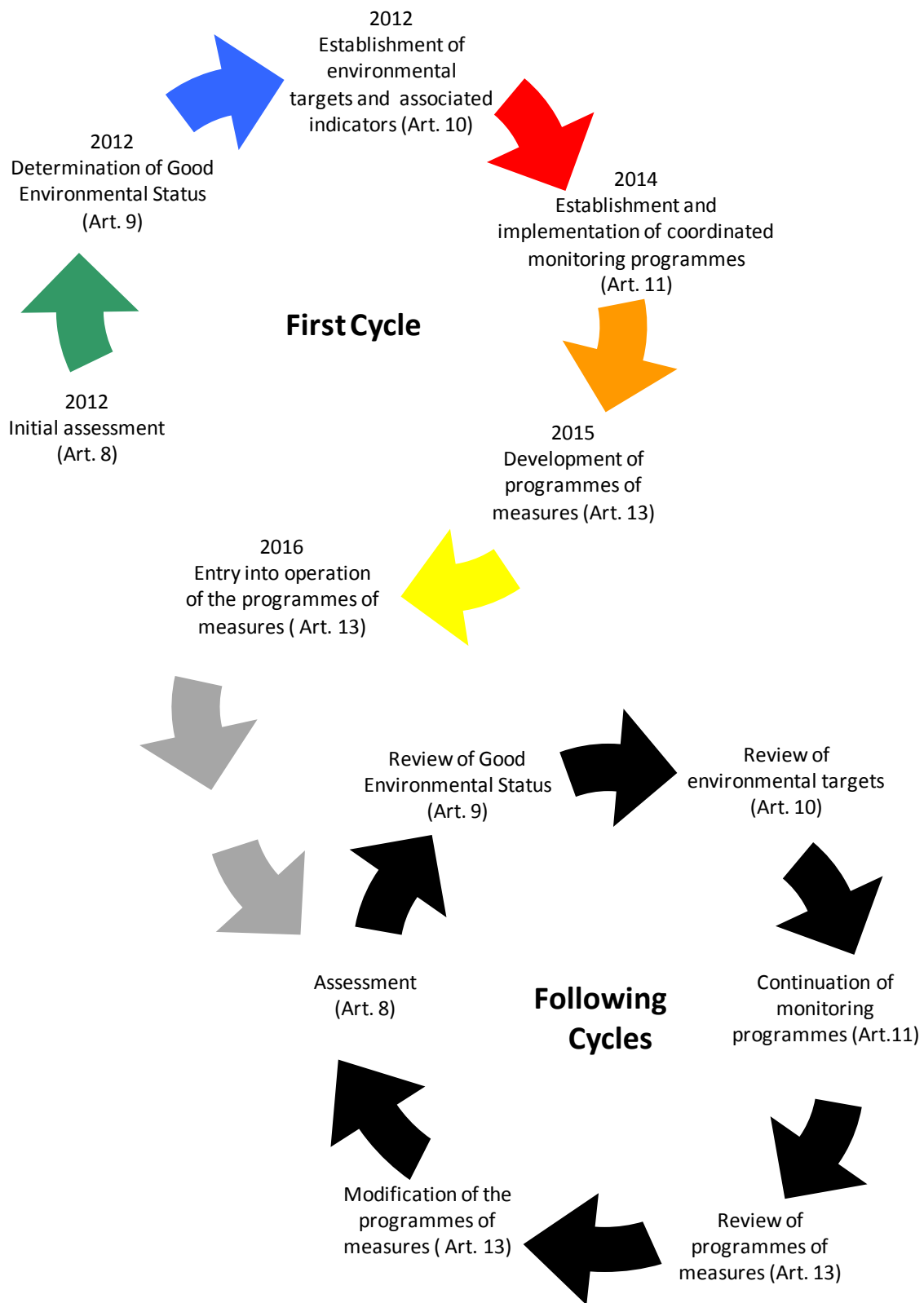


Figure 1 - The MSFD management cycle.

3. *Developing a Common Understanding of Article 8 – (Initial) Assessment.*

- 3.1 This section introduces a number of commonalities specific to Art. 8 MSFD for Member States to consider during implementation.

What does the Directive require?

- 3.2 The Initial Assessment required by the MSFD has to be completed by 15 July 2012. Subsequent assessments are required on a six-yearly cycle as outlined in the previous section.
- 3.3 The Initial Assessment should address, but not be limited to, the indicative lists of characteristics, pressures, and impacts in Tables 1 and 2 of Annex III to the Directive, (as outlined under Art. 8 MSFD) and the criteria and indicators as listed in COM Decision 2010/477/EU. Where this is not possible e.g. because information is lacking or a specific criterion or indicator is deemed not relevant, Member States should provide a clear explanation of their reasoning and an indication of what is needed (e.g. data collection, research etc) to address the gaps.
- 3.4 During the preparation of their assessments, Member States should make every effort to ensure that consistent methodologies are adopted across the marine region or subregion where it is considered possible and appropriate in order to ensure comparability of assessments. Coordination between Member States (and where appropriate with Third Countries) is also necessary in order to ensure that transboundary impacts and features are appropriately accounted for.

Key elements of the assessment.

- 3.5 The requirements of the Directive for the Initial Assessment (see *Figure 2*) include that Member States should:
- i). Provide an analysis of the essential features and characteristics, and current environmental status, based on the indicative lists of elements as laid out in MSFD Annex III, Table 1 which covers physical, chemical and biological features, habitat types, and hydro-morphological conditions.
 - ii). Provide an analysis of the predominant pressures and impacts, including human activities and discernible trends, based on the indicative lists in MSFD Annex III, Table 2 and should cover the main cumulative and synergistic effects.

- iii). Present a social and economic analysis of the use of the marine waters and of the costs of degradation of the marine environment.

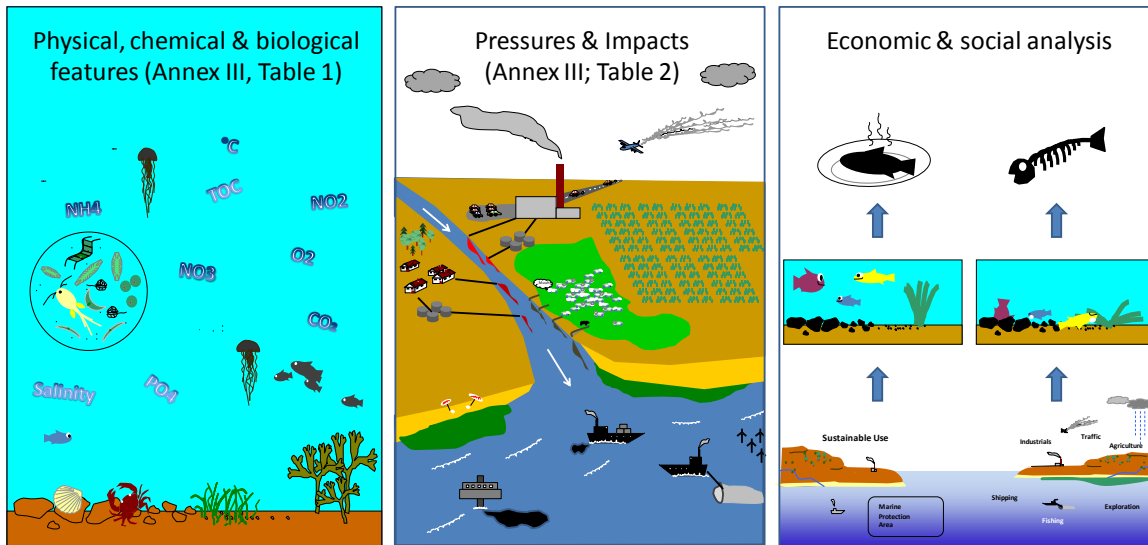


Figure 2: The three main elements of the (Initial) Assessment according to Art. 8 MSFD.

Sources of information for the initial assessment.

- 3.6 Member States' 'initial assessments' are unlikely to provide a complete assessment of all the relevant characteristics, pressures and impacts, because many monitoring programmes are considered fragmentary and do not fully meet MSFD purposes. This is further compounded by a lack of appropriate assessment tools. Some existing tools can be used whilst others can be adapted for MSFD purposes; however, there will be a clear need to develop new assessment tools to ensure appropriate coverage of all aspects of the Directive.
- 3.7 For these reasons Member States' 'initial assessments' are likely, for the most part, to comprise information generated as a result of existing European, regional and national level commitments. In particular the data and information generated from reporting carried out under the following commitments should be utilised:
- Water Framework Directive (WFD, 2000/60/EC)
 - Habitats Directive (HD, 92/43/EEC)
 - Birds Directive (BD, 2009/147/EC)
 - Nitrates Directive (ND, 91/676/EEC)
 - Dangerous Substances Directive (as amended 2006/11/EC)
 - Shellfish Waters Directive (2006/113/EC)
 - Bathing Waters Directive (2006/7/EC)

- Analysis of commercial fish stocks¹ carried out by the International Council for the Exploration of the Sea (ICES) and the General Fisheries Commission for the Mediterranean (GFCM)
- Regional Conventions e.g. OSPAR, HELSINKI (especially the HELCOM Baltic Sea Action Plan)², BARCELONA and BUCHAREST Conventions
- Subregional co-operations e.g. Trilateral Wadden Sea Cooperation (TWSC); or the Agreement on Cooperation for the Protection of the Adriatic Sea and Coastal Areas from Pollution

3.8 For the purpose of reporting the environmental status under the MSFD, assessment results need to be assigned to MSFD classes. It is encouraged that in waters with overlapping regimes, the boundary for Good Environmental Status coincides with the boundaries/thresholds of “favourable conservation status” for the Habitats Directive and “good ecological status” and “good chemical status” for the Water Framework Directive. This is illustrated in Figure 3, in relation to the degree of pressures and impacts from human activities. It is to be noted however that these regimes are applied at differing scales and there may be cases, where good status under the MSFD and WFD may not be sufficient to meet the specific objectives of the Birds and Habitats Directive (cf. 6.31).

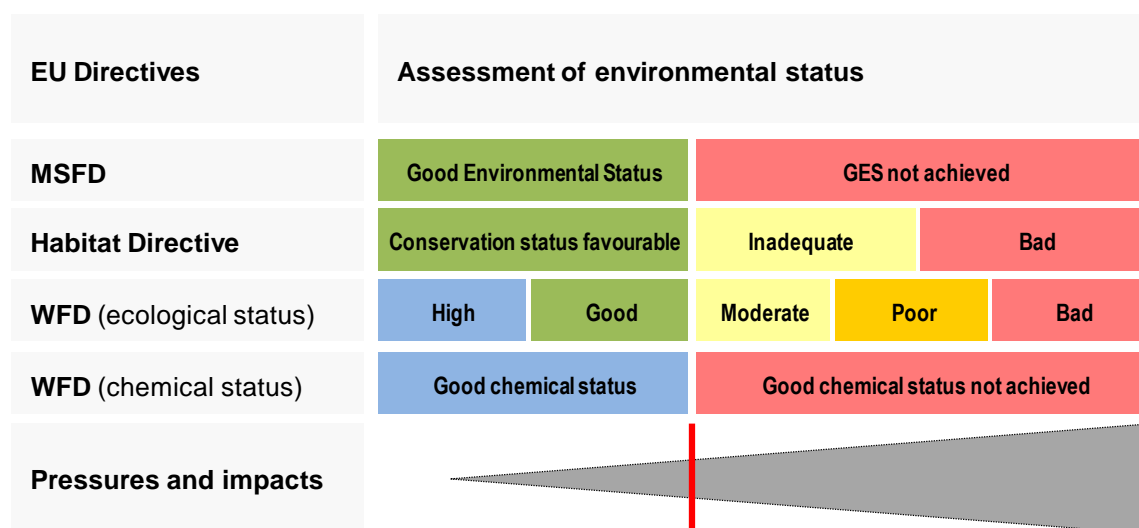


Figure 3: Classifications under EU Directives. In waters with overlapping regimes, the boundary/threshold for Good Environmental Status should coincide with the boundaries/thresholds for “favourable conservation status” of the Habitats Directive and “good ecological status” and “good chemical status” of the Water Framework Directive.

3.9 In addition to the existing sources of information under EU Directives and regional Conventions, there are a number of recently released or soon to be published

¹ Very few shellfish stocks of international economic interest are assessed by ICES. The majority of shellfish stocks are assessed at a national level.

² http://www.helcom.fi/BSAP/en_GB/intro/

regional reports which provide integrated assessments of environmental status and could also be utilised by EU Member States in their initial assessments:

- Initial Holistic Assessment of the Baltic marine environment (HELCOM HOLAS)³
- Quality Status Report 2010 for the North-East Atlantic (OSPAR QSR 2010⁴)
- Wadden Sea Quality Status Report 2009 (Wadden Sea QSR⁵)
- Assessment of the Mediterranean Sea for four Mediterranean subregions⁶
- Assessment of the Black Sea⁷

3.10 It should be noted that these reports provide an assessment at the scale of the convention waters or subregion in question (e.g. Greater North Sea, Baltic Sea basins, four Mediterranean subregions (Western, Ionian and Central, Adriatic Sea, Eastern) and Black Sea), without providing specific assessments at the scale of waters under national jurisdiction. This aggregation of national information at a “higher” level makes it difficult to track respective assessment results back to the scale of individual Member States. This means that whilst these reports should help to meet the Directive’s requirements in relation to regional coordination of initial assessments, these reports alone will not be sufficient for Member States to fulfill their assessment obligations.

3.11 Additional sources of relevant information, upon which Member States can also draw, include research projects, maritime spatial planning activities, Strategic and Environmental Impact Assessments (e.g. renewable energy developments) and national assessments.

3.12 It is likely that even using all available data and information at the disposal of Member States the picture will remain incomplete. This may be particularly noticeable in offshore areas and for those elements of the Directive for which monitoring programmes have historically not existed, e.g. underwater noise. Member States should make it clear where gaps exist in order that the limitations of the assessment are defined and to indicate what is needed to eliminate such gaps.

³ Includes specific thematic assessments of eutrophication, hazardous substances, biodiversity, maritime activities and the coherence of the network of Baltic Sea Protected Areas.

⁴ <http://qsr2010.ospar.org/en/index.html>

⁵ <http://www.waddensea-secretariat.org/TMAP/reports.html>

⁶ http://195.97.36.231/acrobatfiles/08WG326Ecosystem_3_eng.pdf

⁷ <http://www.blacksea-commission.org/main.asp>

Future assessments.

- 3.13 In addition to the aforementioned sources of information, any subsequent assessment and respective refinements should respond increasingly to the requirements of the MSFD and the information generated through fit-for-purpose monitoring programmes. This means that assessments following the first MSFD cycle should move towards full consideration of the relevant criteria and indicators as laid down in COM Decision 2010/477/EU.
- 3.14 It should also be noted that the timing of the assessment in 2018 in relation to the establishment of a programme of measures in 2015 means that it may not be possible to determine the full effect that any management measure may have had on the overall status. This is largely due to the time delays associated with collecting and processing environmental data which will mean the assessment will likely be based on data from 2016 at the latest. There may also be a time delay in the ecosystem responding to any measures put in place.

4. *Approaches to the implementation of Articles 9 & 10.*

- 4.1 It is apparent that, at this initial stage, two different but compatible theoretical approaches have been considered so far by Member States in relation to the implementation of Art. 9 & 10 MSFD.
- 4.2 The first approach addresses Art. 9 MSFD by providing a qualitative description of what GES will look like when achieved for each of the Descriptors. It focuses on Annex I and takes account of Annex III MSFD and COM Decision 2010/477/EU. This is then underpinned by the setting of more detailed quantitative environmental targets based on established environmental thresholds/limits for state, pressure, and impact (Art. 10 MSFD). In the event that quantitative environmental targets cannot be set, trend-based or qualitative targets will be established (see Annex 3 (1)).
- 4.3 The second approach considers GES to be determined under Art. 9 MSFD through both a qualitative description and using environmental thresholds/limits which quantitatively describe the desired state of the environment based on Annexes I and III (in particular Table 1) MSFD and COM Decision 2010/477/EU. Environmental targets will be set under Art. 10 MSFD in order to guide progress towards achieving GES. These will be primarily pressure and impact based since the reduction in pressures and impacts is the most effective way to achieve or move towards to GES., Some targets may be set for state elements, expressed

as bridging the gap between current status and GES, and possibly articulated with the GES determination by a change of scale (see Annex 3 (2)).

- 4.4 Both approaches, although different from each other, are considered, at this stage of implementation, equally valid because, the one way or the other, they will both include quantitative targets/thresholds/limits for state, pressure and impact. Considered as a package, the comprehensive overall combination of GES characteristics, targets and associated indicators under both approaches are expected to largely produce similar results to achieve or maintain GES. It should be noted that the development of appropriate monitoring programmes and the establishment of programmes of measures will be determined on the basis of the determination of GES and the targets and indicators. Therefore, it is desirable to move towards a quantitative approach to determining GES and targets at the earliest opportunity.
- 4.5 In practice it is likely that Member States' approaches to implementation will reflect a mixture of the two above approaches since this would be a more pragmatic and less rigid way forward which accounts for current levels of understanding. An overview of the national approaches reported in 2012 could eventually show that one approach may be preferable for all Member States for certain aspects of the Directive and the other approach for other aspects.
- 4.6 After submission by Member States of the key deliverables in July 2012 and following the Commission's assessment under Art. 12 MSFD, it would be advisable for Member States to consider in more detail the merits of the different approaches. The assessment by the European Commission under Art. 12 MSFD can play an important role to drive coherence in this context.⁸ The run-up to the update of marine strategies, due in 2018 (Art. 17 MSFD), will be also a major opportunity to enhance further coherence in the longer term.
- 4.7 With these considerations in mind the following two sections articulate the common or shared principles which can be applied to the interpretation of the two Articles individually. Following these, Art. 9 & 10 MSFD will be addressed together in order to better reflect those shared principles which differ only as a result of the Article under which they are being implemented by Member States.

⁸ The process for the elaboration of the Commission Art. 12 report, as well as criteria used for the assessment of Member States' reports, and the follow-up process for integrating the Commission recommendations in national Marine Strategies, is currently under consideration at Commission level and will be discussed in the MSFD common implementation strategy framework (Marine Strategy Coordination Group and Marine Directors).

4.8 It should also be noted that when determining GES and establishing targets there are a number of cross-linkages between Descriptors at the level of criteria and indicators. For this reason it is important to undertake a process of checking and reconciling to ensure comprehensive and coherent coverage and eliminate any redundancies.

5. Developing a common understanding of Article 9 - Determination of Good Environmental Status.

5.1 This section introduces a number of commonalities specific to Art. 9 MSFD for Member States to consider during implementation.

What does the Directive require?

5.2 Art. 9 MSFD requires that ‘Member States shall, in respect of each marine region or subregion concerned, determine, for the marine waters, a set of characteristics for good environmental status, on the basis of the qualitative descriptors listed in Annex I’. This determination of characteristics for GES should be referenced to the initial assessment.

5.3 Figure 3 illustrates those components that should be considered in the process of determining GES:

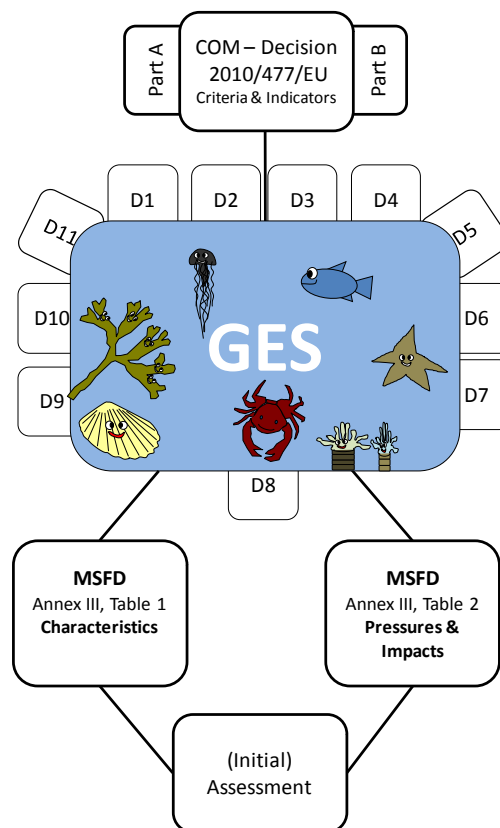


Figure 3: GES is determined by reference to the initial assessment and on the basis of the eleven GES descriptors in Annex I MSFD. The characteristics of GES can be described in a qualitative and/or a quantitative fashion taking account of the characteristics (MSFD Annex III, Table 1), and pressures and impacts (MSFD Annex III, Table 2) of human activities, and the criteria and indicators as laid out in COM Decision 2010/477/EU.

5.4 The eleven Descriptors of GES (Ocean eleven ☺) can, for ease, be split into those that refer to state (marine biodiversity (D 1), food webs (D 4), sea floor integrity (D 6) and (partially) commercial fish stocks (D 3)) and those that refer to the most important or relevant anthropogenic pressures (non-indigenous species (D 2), (partially) fisheries (D3), nutrient enrichment (D 5), physical damage (D6 and D7), contaminants (D 8 & 9), marine litter (D 10) and energy, including underwater noise (D 11)). It is recognised that this is a split of convenience since in reality some of the 'state' descriptors may include pressure indicators and some of the 'pressure' descriptors may include state indicators. It should also be noted that the set of Descriptors, as defined through the associated criteria and indicators, does not necessarily fully address the definition of GES as given in Art. 3(5) MSFD. Other issues with relevance for determining GES may arise as knowledge grows and ecosystem-based assessment frameworks develop. The descriptors in Annex I MSFD and the criteria and indicators of COM Decision 2010/477/EU should accordingly be reviewed and relevant additional aspects be taken into account.

How should GES be determined?

5.5 Together with the protection and preservation of the marine environment, the concept of sustainable use is enshrined within the Directive (Art. 1(3) MSFD). Therefore, GES should be defined from an ecological perspective to achieve healthy and functioning marine ecosystems while enabling the sustainable use of marine goods and services. In determining GES, past human activities and their impacts on the ecosystem alongside the ecosystem's resilience and recovery capabilities must be taken into account. Therefore, GES is unlikely to reflect a pristine status. In addition, prevailing environmental conditions, including natural variability and climate change, must also be considered. This is reflected in *Figure 4* (below) where GES can be seen to be differentiated from a pristine status. *Figure 4* illustrates the case where the status of the environment in 2012 is below GES and requires improvement towards GES, possibly including restoration. Where the current status meets GES, marine strategies need to ensure that the good environmental status is maintained.

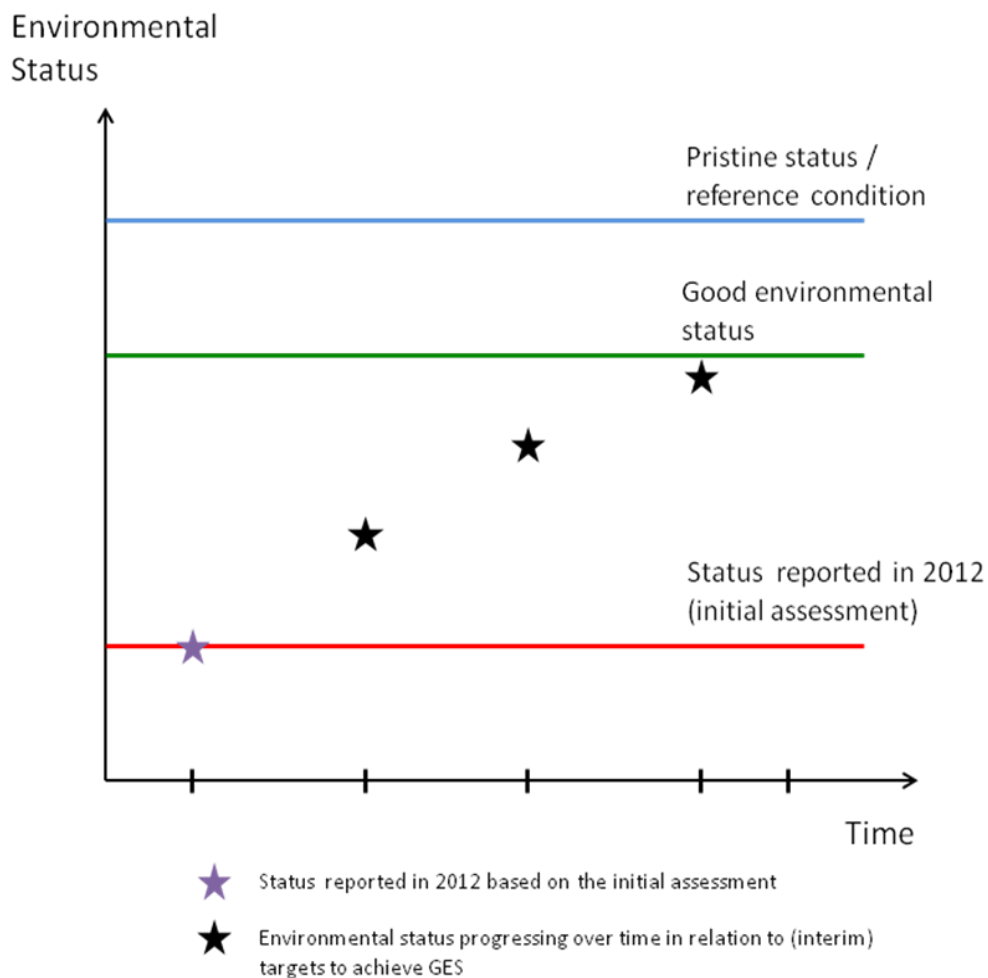


Figure 4: Pristine status/reference condition is considered highest quality, followed by the desired future environmental status (GES). This can be set in relation to the pristine status and/or by reference to the status in 2012 (based on the initial assessment) which in this example is shown to be below GES and requiring restoration. The concept of interim target is further explained at 6.36.

5.6 To help Member States in carrying out their determination of GES a number of common principles can be identified. GES should:

- i). Be determined by reference to the Initial Assessment (taking into account the best available data and understanding of pressure-impact relationships) and on the basis of MSFD Annexes I & III and COM Decision 2010/477/EU as adopted under Art. 9(3) MSFD.
- ii). Take into account the prevailing environmental conditions, resilience and recoverability of the ecosystem, and human activities, their interactions and impacts.
- iii). Be a qualitative and/or quantitative expression of the desired condition of the environment according to Art. 3(5) MSFD.

- iv). Describe what the environment should look like in terms of the state/condition of the ecosystem and, if appropriate, the acceptable levels of human pressure and impact.
 - v). Accommodate sustainable human activities and uses which locally may cause some degradation to the environment (i.e. minor or very localised areas of degradation⁹), but which collectively do not prevent the achievement of GES at the level of the region or subregion. It should be noted that even local degradation may have broader impacts, especially in light of the potential for cumulative and synergistic effects. In future assessments of whether the defined GES has been achieved or not, the provision on exceptions (Art. 14 MSFD) provides an additional means to tackle cases of local degradation.
 - vi). Be compatible with other existing national, EU or international objectives such as the Water Framework Directive, Habitats Directive, Birds Directive, the Convention on Biological Diversity and Regional Sea Conventions etc. (where these apply).
 - vii). Recognise any links and interdependencies between Descriptors, criteria and indicators.
 - viii). Go at least as far as the current knowledge base allows and ensure that areas of uncertainty are clearly explained.
 - ix). Be described at a scale appropriate for each Descriptor (e.g. nationally, subregionally, regionally), in particular at an ecologically relevant scale and recognising that scales may differ depending on the Descriptor in question.
 - x). Be coordinated with other countries in the marine region or subregion concerned to ensure comparability in order that determination of GES is coherent across borders.
 - xi). Be reviewed every six years to take account of changes to the prevailing environmental conditions, the dynamics of ecosystems, changes in human pressures, improvements in the knowledge base and management experience.
- 5.7 Member States are encouraged to exchange data and information to foster coherence in defining GES and to help each other to close gaps in information for neighbouring waters in the same marine region/subregion.

⁹ This may be an activity taking place over an area in the order of m² to a few km².

- 5.8 COM Decision 2010/477/EU lays down and partly explains 29 criteria and 56 indicators. Part A of the Commission Decision outlines that “*The criteria for assessing the extent to which GES is being achieved are specified and numbered in Part B in relation to each of the eleven Descriptors of GES... The criteria are accompanied by a list of related indicators to make such criteria operational...*”. This could be interpreted to mean that Part B of the Commission Decision should be used for a more specific definition of the eleven state-based and pressure-based Descriptors and the basis of a methodology for environmental status assessment. In this Decision, methodological standards are not included. A general reference to available methodological standards can be found in the JRC Technical Report ‘Review of Methodological Standards related to the MSFD criteria on GES (JRC 2011)’¹⁰. Additional information can also be found in the Commission Staff Working Document on the relationship between the initial assessment of marine waters and the criteria for good environmental status (SEC(2011) 1255 final)¹¹.
- 5.9 In order to support the determination of GES and the establishment of environmental targets, Member States should consider those criteria and indicators which are currently applicable and operational. As COM Decision 2010/477/EU declares in Part A (1) and (9), there is a need for a number of the criteria and related indicators to be further developed before they can be considered operational.
- 5.10 Further details on the steps involved in determining GES can be found in Section 7.

A qualitative and/or quantitative determination of GES

- 5.11. The requirement laid down in Art. 9 (1) MSFD has been interpreted to mean that GES can be described in either (or both) a qualitative and quantitative manner¹². As described in Section 4, it is considered appropriate for the purpose of the deliverables in 2012 to approach the determination of GES either entirely qualitatively, relying on the underpinning environmental targets to articulate quantitatively the point at which GES is achieved, or in a more quantitative manner, by establishing thresholds/levels/limits which articulate the condition of the environment when GES is achieved. A combination of both qualitative and quantitative elements may also be considered and this more likely reflects the

¹⁰ <http://publications.jrc.ec.europa.eu/repository/handle/111111111/16069>

¹¹ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=SEC:2005:1255:FIN:EN:HTML>

¹² Making use of COM Decision 2010/477/EU and ensuring appropriate coverage of Annex III characteristics (Table 1), and pressures and impacts (Table 2) of human activities.

approaches currently adopted by Member States (see 4.5 above). The components for determining GES as defined in Art. 3(5) MSFD are illustrated in Figure 5.

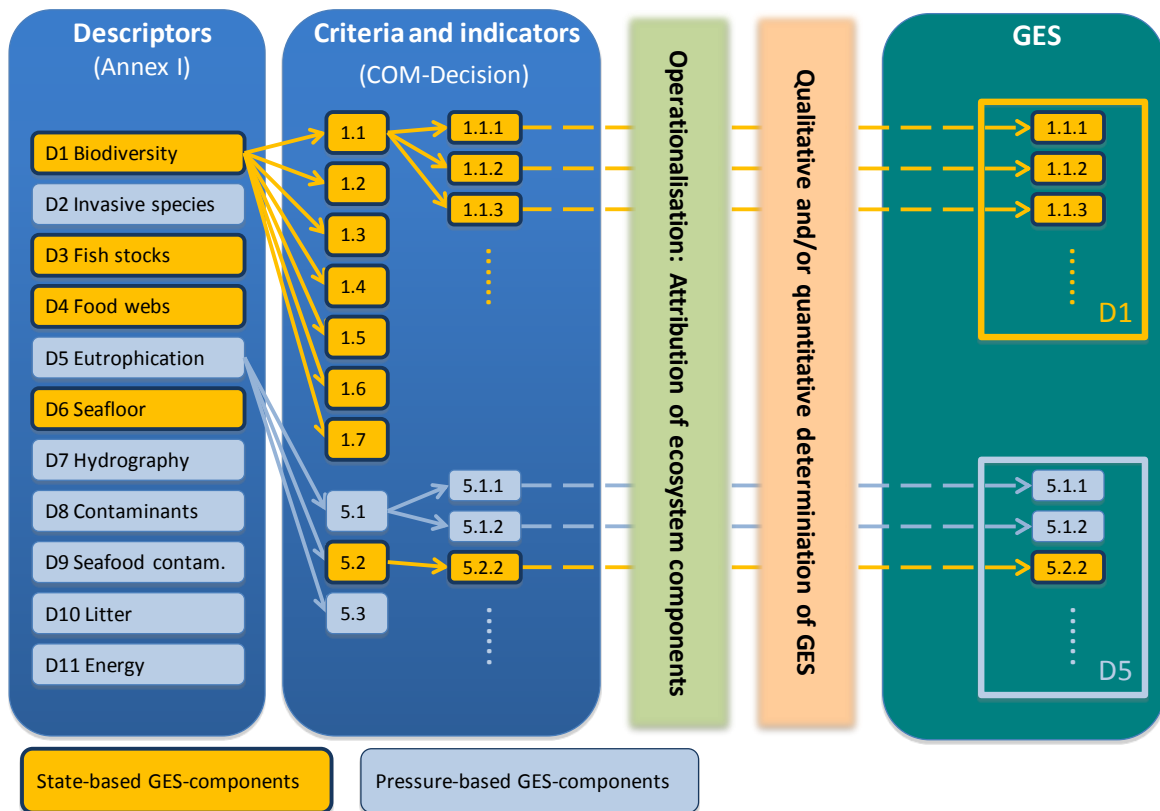


Figure 5: Components for the determination of Good Environmental Status (GES) as defined in Art. 3(5) MSFD. Art. 9 MSFD reflects 11 Descriptors (Annex I), as well as 29 criteria and 56 indicators (as specified in COM Decision 2010/477/EU). In particular for the state-based Descriptors D1, D3, D4 and D6 (shown in orange), several assessments for each indicator might have to be developed as different ecosystem components have to be considered. Overall GES is then determined through qualitative and/or quantitative expression of a set of criteria and indicators. Pressure-based GES elements are shown in light blue.

At what scale should GES be determined?

5.12 Art. 3(5) MSFD states that ‘good environmental status shall be determined at the level of the marine region or subregion’. Art. 9 MSFD requires that Member States shall, ‘in respect of each marine region or subregion concerned, determine, for the marine waters, a set of characteristics for good environmental status’. The characterisation by Member States of their waters provides the starting point for ultimately determining GES at the level of the marine region or subregion and provides one of the preparatory steps for Member States to develop ‘in respect of each marine region or subregion concerned, [...] a marine strategy for its marine waters’ (cf. Art. 5(1) MSFD).

- 5.13 From a practical perspective, GES should be determined at a scale which is deemed most appropriate for assessment of the particular Descriptor or ecosystem component in question (see section 5.6 (ix) above). A relevant scale for assessment can be smaller subdivisions of region/subregions.¹³
- 5.14 It is important to recognise that considering the implications of human activities on environmental status at too broad a scale (e.g. North-East Atlantic) will not provide an accurate assessment of state given that many activities will be deemed to be taking place over too small an area to have a measurable impact at such a large scale (see section 5.6 (v) above). It is noted that the cumulative and synergistic effects of localised activities may well have larger effects which must be considered.

GES determination until 2012

- 5.15 Determination of GES during the first round of application up to 2012, as specified by the MSFD and COM Decision 2010/477/EU, will largely rely on existing assessments, methodologies and information (see 3.7 above). This existing information should therefore be attributed to the criteria and indicators of COM Decision 2010/477/EU, allowing for an identification of aspects already covered or partially covered and identifying existing gaps in methods and data or need for adaptation of existing approaches to MSFD GES requirements (e.g. scale, baseline, objectives).

The determination of GES is not definite

- 5.16 The first determination of GES in 2012 largely relies on existing information, data and methodologies. Any gaps should be addressed during subsequent MSFD cycles through, for example, the development of new methodologies and the gathering of additional data through monitoring programmes. Art. 17 MSFD requires the updating of national Marine Strategies which *inter alia* include a determination of GES. In addition, Art. 12 MSFD provides the European Commission with an early opportunity in the first cycle to provide guidance on any modifications it considers necessary.¹⁴

¹³ Examples for further guidance on ecologically relevant scales is given in the OSPAR Draft Advice Manual for MSFD Biodiversity Descriptors (Draft 2, version 2, 31 May 2011).

¹⁴ The process for the elaboration of the Commission Art. 12 report, as well as criteria used for the assessment of Member States' reports, and the follow-up process for integrating the Commission recommendations in national Marine Strategies, is currently under consideration at Commission level and will be discussed in the MSFD common implementation strategy framework (Marine Strategy Coordination Group and Marine Directors)

5.17 It is important to note that the expression of GES, which is based on existing knowledge, will need to evolve over time. This will ensure that it reflects not only wider background changes in the environment, such as climate change, but also improvements in scientific knowledge and understanding and management experience.

6. General principles relating to Article 10 MSFD - the establishment of environmental targets.

6.1 This section introduces a number of commonalities specific to Art. 10 MSFD for Member States to consider during implementation.

What does the Directive require?

6.2 On the basis of the initial assessment, Member States shall, under Art. 10 MSFD, *'establish a comprehensive set of environmental targets and associated indicators for their marine waters so as to guide progress towards achieving good environmental status in the marine environment'*.

6.3 Art. 3 (7) MSFD defines an environmental target as, *'a qualitative or quantitative statement on the desired condition of the different components of, and pressures and impacts on, marine waters in respect of each marine region or subregion'*.

6.4 Finally Annex IV (2) MSFD refers to the *'need to set (a) targets establishing desired conditions based on the definition of good environmental status; (b) measurable targets and associated indicators that allow for monitoring and assessment; and (c) operational targets relating to concrete implementation measures to support their achievement'*.

6.5 Based on the above definitions a comprehensive set of environmental targets and associated indicators are to be established which reflect the changes in state, pressure and impact necessary to achieve or maintain GES. In addition to these, a fourth type of environmental target called an 'operational target' is required. Such operational targets may be directly linked to the state, impact and pressure targets in order to help establish the concrete (practical) management measures necessary to achieve or maintain GES. Operational targets may also be set independently where management action is desirable, but it is not possible to establish associated state-, pressure-, or impact-targets e.g. due to a lack of understanding (see *Figure 6*).

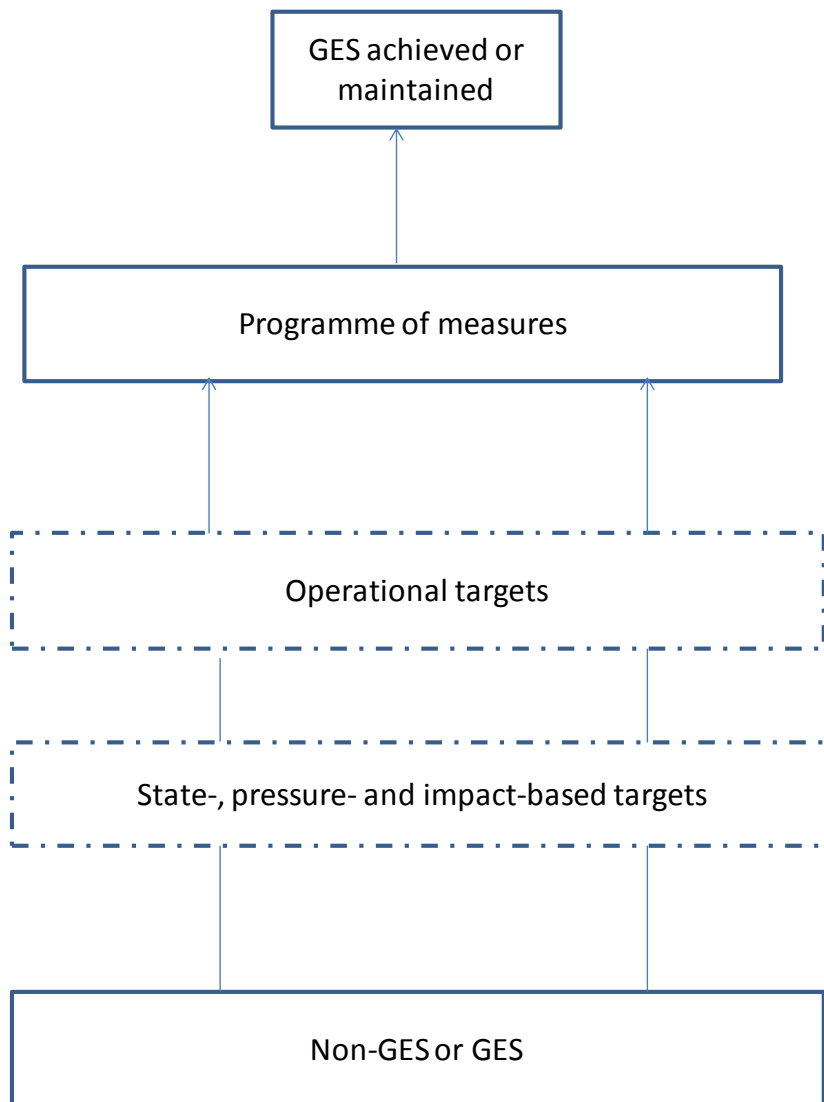


Figure 6: Art. 9 and Annex IV(2) MSFD require that different types of environmental targets are established (state-, pressure-, impact-, and operational targets). If knowledge-base is sufficient, state-based and impact-based targets can be expected to link closely to pressure-based targets. These three target types are expected to guide the setting of management measures under Art. 13 MSFD either directly, or indirectly via the establishment of operational targets. Operational targets may also be set independently where management action is desirable, but it is not possible to establish associated state-, pressure-, or impact-targets e.g. due to a lack of understanding. On occasion it may be appropriate to establish interim targets to help guide progress towards achieving or maintaining GES by 2020 (cf. Section 6.36).

Guiding principles for the setting of environmental targets

6.6 Environmental targets can be seen as a means of articulating in a quantitative or qualitative manner either the desired levels of, or necessary changes to, environmental pressures and impacts which would ultimately result in the achievement of GES. They may also reflect GES itself or the actual changes necessary to the current state in order to achieve or maintain GES.

6.7 The establishment of environmental targets should take into account the ‘indicative lists of characteristics, pressures and impacts’ as outlined in Annex III MSFD and the ‘indicative list of characteristics to be taken into account for setting environmental targets’ as set out in Annex IV MSFD (see Figure 7).

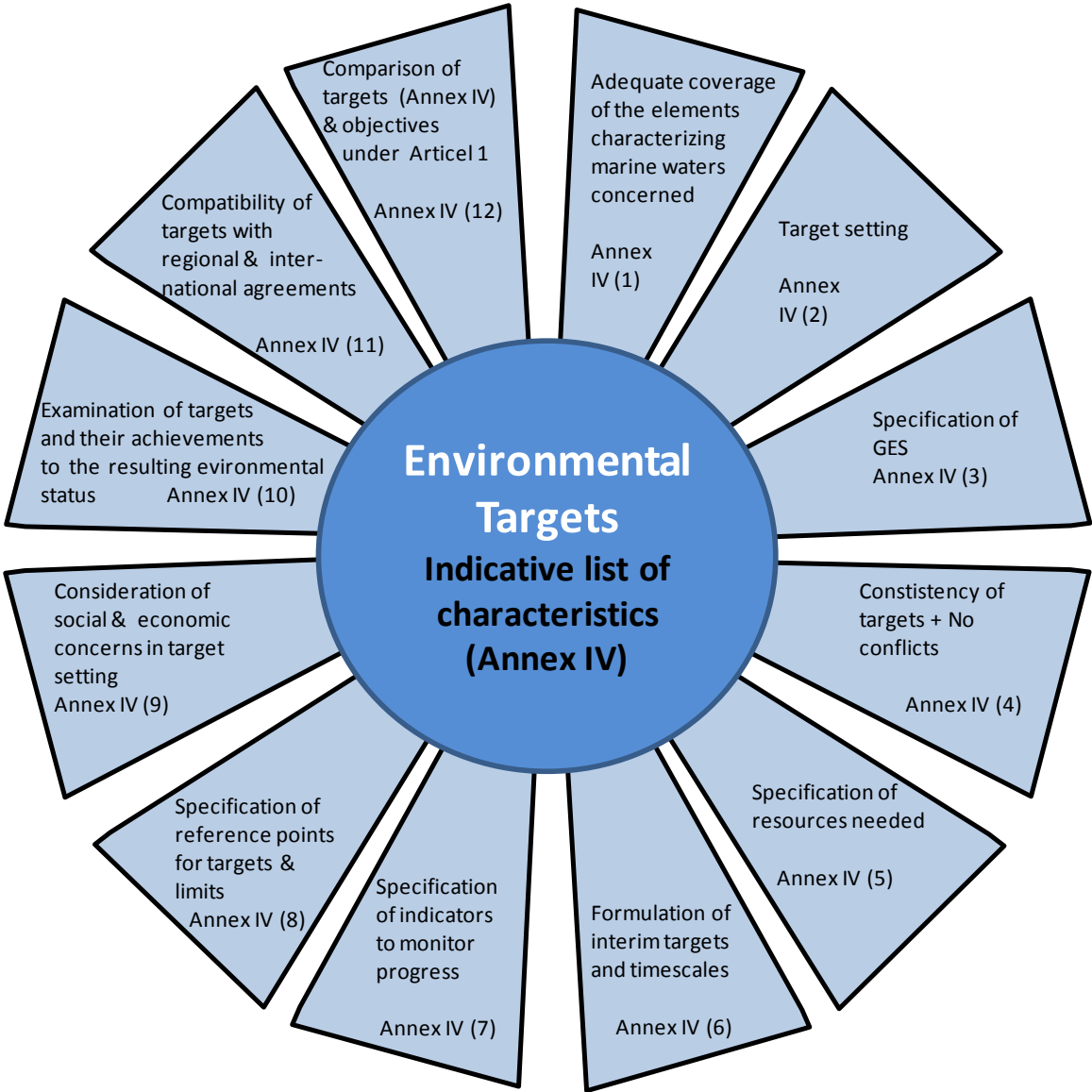


Figure 7: The indicative list of characteristics of environmental targets as outlined in Annex IV MSFD.

- 6.8 Based on the text in the Directive, a number of common principles can be identified which can help Member States in establishing their environmental targets, taking account of the catalogue of Annex IV MSFD. Environmental targets should:
- a) Be sufficient to achieve or maintain GES, recognising that interim targets may be appropriate to reflect barriers to achieving or maintaining GES and that targets are set with the intention of achieving GES based on our best available understanding at the time.
 - b) Be quantitative where at all possible and qualitative when this is not possible (e.g. where knowledge is currently not sufficient, e.g. noise, litter).
 - c) Relate to state, pressure or impact, as laid out under Annex III MSFD.
 - d) Relate to concrete implementation measures through operational targets where appropriate (Annex IV (2) MSFD).
 - e) Address the criteria and the indicators in COM Decision 2010/477/EU where appropriate.
 - f) Be measurable in order to allow for monitoring and assessment by way of associated indicators (Annex IV (2) MSFD).
 - g) Specify, where appropriate, reference points (target and limit reference points) (Annex IV (8) MSFD).
 - h) Include, as appropriate, and be compatible with existing targets already in place at a national, Community or international level (Annex IV (11) MSFD).
 - i) Give due consideration to social and economic implications (Annex IV (9) MSFD).
 - j) Be internally consistent, with no conflicts existing between them (Annex IV (4) MSFD).
 - k) Be developed to apply at an appropriate scale (in the context of the scale for assessing GES, cf. Section 5.6(ix)).
 - l) Include timescales for achievement and, if appropriate, include interim targets (Annex IV (6) MSFD).

- m) Pay regard to the Precautionary Principle (targets should be set if current knowledge is insufficient but a clear risk of unacceptable impacts can be established).

So what are Environmental Targets?

6.9 Definitions for the different types of environmental targets are given below. Determining which type of environmental target to use and when will be largely dependent on the robustness of the evidence available and the nature of the Descriptor in question. Environmental targets could be set directly in relation to the eleven Descriptors (see Annex I MSFD) and their related criteria and indicators as far as they are developed (as outlined in the COM Decision 2010/477/EU), and/or with respect to the characteristics and pressures laid down in Annex III MSFD.

a) State-based targets

These provide an indication as to the physical, chemical or biological condition of the environment that would be observed when GES is achieved. These targets are particularly relevant for Descriptors D1, D3, D4, D6 which predominantly cover state. However, it should be recognised that there are state-based elements within other Descriptors e.g. D5 and D7 for which such targets would also be appropriate.

An example of a state-based target can be seen in the OSPAR EcoQO on size composition of fish communities: *'At least 30% of fish (by weight) should be greater than 40 cm in length'*.

b) Pressure-based targets

These targets can be used to articulate the desired or acceptable level of a particular pressure which would not prevent the achievement or maintenance of GES. Such targets are attractive as they can be much more easily related to management measures and are often easier and more cost effective to monitor than state-based targets. They should be used in particular where a clear understanding of the relationship between pressure, state and impact exists, and where cumulative effects can be accounted for. Where such a relationship has not yet been established, pressure targets may be set on the basis of the precautionary principle. In instances, where a quantitative approach is not feasible trend-based targets may be appropriate.

An example of a pressure-based target might be '*fishing mortality is at levels consistent with MSY*'.

c) Impact-based targets

These provide an indication of the acceptable level of impact on the components of the marine environment (MSFD Annex III, Table 1) arising from a particular pressure or range of pressures. It is noted that impacts could lead to a significant impact at lower level than the ecosystem as a whole (e.g. on specific habitats and species within a region or subregion or water quality) and thus not be compatible with the requirements of the Directive (e.g. to maintain biodiversity). Ecosystem components need to be considered at an ecologically relevant scale in relation to the region or subregion.

Examples of an existing impact-based targets include - '*Annual by-catch of harbour porpoises should be reduced to below 1.7% of the best population estimate*', and, '*the average level of imposex in dog whelks (Nucella lapillus) should be consistent with exposure to TBT concentrations below the environmental assessment criterion for TBT*'.

d) Operational targets

These targets relate directly to the nature of management action required in order to achieve or maintain GES without directly establishing the specific measures themselves (see Annex IV (2) (c) MSFD). Operational targets can also allow for the assessment of progress towards full implementation of a specific measure.

An example of an operational target is the nutrient load reduction target of the HELCOM Baltic Sea Action Plan, expressed per country as requirement '*to reduce by 2021 the input of nitrogen and phosphorus by x tonnes*'. A further example is a target to implement this commitment at national levels, which might be '*to reduce total inputs of nitrogen and phosphorus from the different sources (e.g. agriculture, waste water treatment plants, traffic) by %*'.

6.10 Further examples of environmental targets can be found in the Table at Annex 2. The following section considers the different types of target in more detail.

Spotlight on pressure and impact targets

6.11 It is primarily through the management of human activities that improvements in the ecological state of marine ecosystems will be realised and, as such, establishing appropriate levels of pressure and impact is essential in order to

achieve or maintain GES. Improvements to ecological state are possible through other means, such as the restoration of habitats or the recovery of species; however such approaches can be prohibitively expensive. This emphasises the importance of pressure- and impact-based targets to help avoid deterioration (and consequently the potential need for costly restoration) of the environment in the first place.

- 6.12 In order to determine appropriate pressure and impact levels and consequently suitable targets, it will be necessary first to compare current environmental status (Initial Assessment) with the desired environmental status (GES). Addressing the difference between the two states can be done by adjusting current levels of environmental pressure or impact¹⁵. Such a target can be articulated as the necessary change in pressure, the overall desired pressure level itself, or the reduction of the intensity and/or extent of the impact (e.g. levels of by-catch, levels of habitat damage, levels of impact on population health or ecosystem functioning), before being addressed through the establishment of appropriate management measures. These targets, in effect, aim to close the gap between the two environmental states. The path from GES to pressure and impact environmental targets is illustrated in *Figure 8*.
- 6.13 It should be noted that a target should be set even if the desired level of pressure has been achieved e.g. articulating the desired level of pressure to be maintained.

¹⁵ With reference to MSFD Annex III, Table 2.

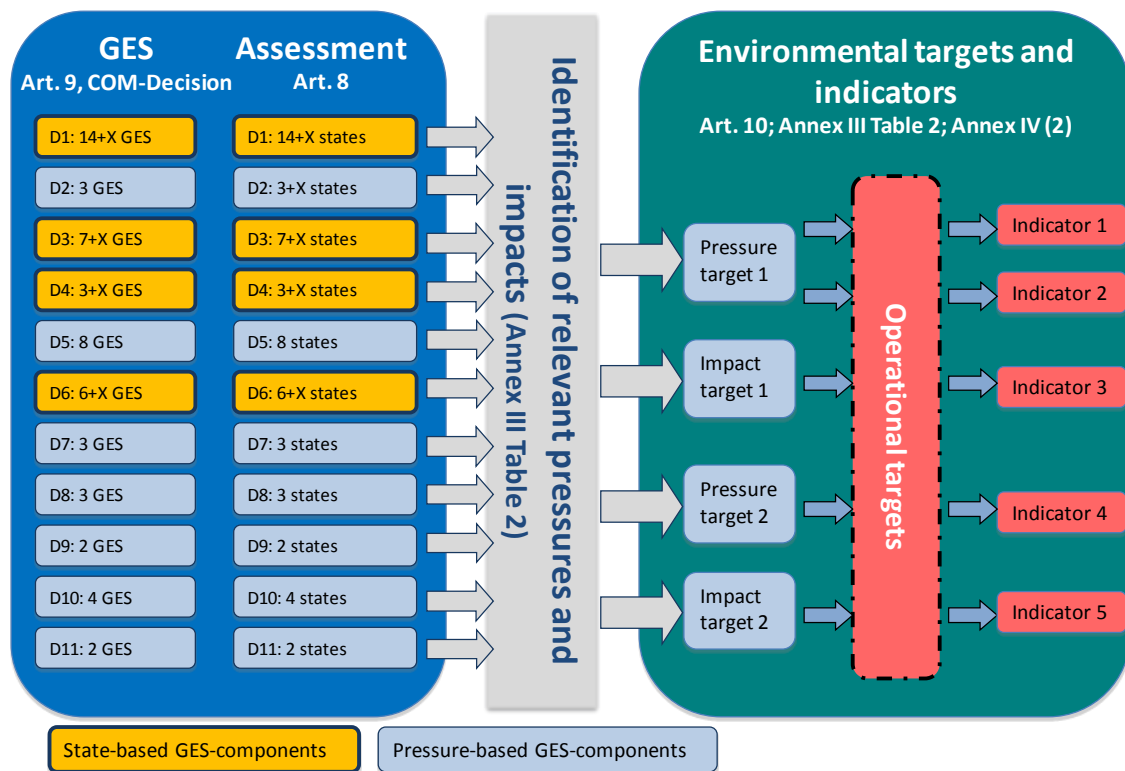


Figure 8: The establishment of pressure and impact targets according to Art. 10. Pressure and impact targets can be derived from a comparison of the current state with the environmental state under GES in relation to the pressures and impacts listed in Table 2 of Annex III MSFD. An environmental target can be relevant for several descriptors and GES definitions. Ideally operational targets link pressure and impact targets with indicators and measures; pressure and impact targets may themselves constitute operational targets (e.g. input reductions for nutrients or contaminants, see examples at Annex 2).

- 6.14 Key to the setting of pressure and impact targets is the identification and description of the current anthropogenic pressures and impacts in the marine environment for the relevant MSFD criteria and indicators and based on MSFD Annex III, Table 2. This needs to be followed by a clear expression of the required changes for the identified pressures and impacts in order to achieve or maintain GES (see Commission research paper 'Economic assessment of policy measures for the implementation of MSFD' (due end 2011)).
- 6.15 From an entirely practical perspective, establishing a comprehensive suite of pressure-based and impact-based targets will greatly assist in meeting the requirements of Art. 13 MSFD (Programmes of Measures) given that it is likely to be easier to make explicit links with management measures than is the case for state-based targets.
- 6.16 In addition, it is likely to be easier to articulate a desired pressure or impact level as opposed to a desired state, especially in light of the potential difficulties in providing quantitative information for ecological components such as abundance

or biomass of species. This should, however, not reduce efforts to develop state-based targets and should be complemented by adequate state monitoring.

- 6.17 For a defined area, recent assessment results can be used to select the most sensitive parameter affected by a certain pressure. The bigger the distance between cause and effect (e.g. nutrient emissions and inputs – phytoplankton – organic matter – oxygen), the more complicated a translation of targets to reduction measures will be (due to the complex nature of ecosystem interactions).
- 6.18 Finally, pressure-based targets (relating to human activities) and impact-based targets (taking into account direct and indirect impacts of pressures) could potentially serve as a transparent and manageable way of achieving or maintaining GES since a reduction in a pressure or impact should, in most cases, have a positive effect on ecosystem integrity and biodiversity and thus environmental status as a whole. This is, however, dependent on there being an established link between state and pressure/impact, recognising that in some instances there is a need to monitor changes in both pressure and state. This may reveal situations where GES cannot be achieved, for example because a non-reversible change of the system has taken place, the ecosystem is less resilient, or it takes longer to restore the ecosystem than expected. Such cases should be addressed through Art. 14 MSFD.
- 6.19 In principle, where GES for state-based Descriptors (D1, 3, 4, 6) are achieved it follows that GES for pressure-based Descriptors should also be met. Should this not be the case then it is likely that the pressure-based GES has been set incorrectly, potentially as a result of: the scales adopted; the way GES has been determined; or the specific parameter chosen for the pressure. This is further illustrated in the following examples:

Example 1: The overall status of bottlenose dolphin populations cannot be considered to be at GES if by-catch levels are shown to be at a higher level than that determined for achieving or maintaining GES. If GES seems to be met the state-based GES determination and targets must be checked to ensure that appropriate sensitivity to the respective pressure and/or impact has been factored in, or whether the pressure/impact indicator itself is too sensitive.

Example 2: GES for cetacean populations at a regional or subregional level may be achieved despite potential localised behavioural impacts resulting from underwater sound generated by developments. In such a case GES may still be

achieved despite local noise levels exceeding levels able to cause degradation, largely as a result of the appropriate spatial scales i.e. the regional and highly mobile nature of cetacean populations.

Spotlight on state targets

- 6.20 Depending on the approach to Art. 9 and 10 MSFD, state-based targets can also be set by comparing the current state (initial assessment) with the desired state (GES) as this is done for pressure-based and impact-based targets. The necessary improvement in state required to close the gap can be expressed as a target. Additionally the actual desired state could also be used as a state target.
- 6.21 As with pressure-based and impact-based targets, in the event that the desired status is achieved, a target should still be articulated, allowing for that status to be maintained.
- 6.22 Such targets are particularly useful when it is not possible to establish clear links between changes in state and specific anthropogenic activities, or when multiple pressures and impacts from different sources could affect the achievement or maintenance of GES. In effect, state-based targets act as a means of determining whether changes made to the levels of pressure and impact are having the desired effect, thus they can be used to directly determine the capability and effectiveness of measures taken. They also allow us to determine, through monitoring and assessment, whether GES is being reached or not.

Spotlight on operational targets

- 6.23 All pressure-, impact- and state-based targets should ultimately link with management measures. This may be directly, or through the use of operational targets which relate more practically the target to concrete implementation measures without detailing the necessary measure(s) themselves (*Figure 6* above).
- 6.24 There is also the potential for establishing operational targets in situations where it is not immediately possible to quantify a desired state, pressure, or impact level, but it is clear that management actions are necessary or desired. This can be illustrated when considering marine litter where we may currently be unsure of the quantities and properties of marine litter that would prevent the achievement of GES; however, we may still want to take early action to reduce current levels. With this in mind an operational target may be chosen relating, for example, to the implementation of recycling measures, e.g. x% of plastic recycled annually.

- 6.25 Operational targets can allow for a quantitative assessment of the progress being made towards the implementation of management measures by placing them in space and time, i.e. by quantifying measurable aspects, such as spatial coverage or intensity of a pressure. In some cases, pressure and impact targets can themselves constitute operational targets since in practice the differences between them can be minimal (see example of pressure and operational targets for eutrophication and contaminants at Annex 2).
- 6.26 Setting such targets is encouraged as a basis for establishing programmes of measures. Depending on how the setting of operational targets is approached, e.g. as a quantitative expression of the types of measures to be taken or as a means of placing a measure in space and time (cf. examples at Annex 2 for D8, 10, 11), it may be difficult to distinguish them from the management measures themselves. In the case of the latter there is a possibility that an operational target may pre-empt the establishment of management measures due in 2015.

The role of indicators in target development

- 6.27 Art. 10 MSFD requires that environmental targets be measurable, thus they need to be associated with appropriate indicators. It is expected that these indicators will be largely based on those outlined within the EU COM Decision 2010/477/EU.
- 6.28 The indicators put forward in EU COM Decision 2010/477/EU vary in the extent to which they are currently developed and it is those indicators relating to the Descriptors broadly addressing state (D1, 3, 4 & 6) that currently require most development. Many of the indicators relating to the pressure-based Descriptors as outlined in EU COM Decision 2010/477/EU are already available for application and can therefore be adopted without further development.
- 6.29 It may be necessary to develop and/or apply additional indicators to address additional pressures considered relevant but not explicitly covered in the EU COM Decision 2010/477/EU, e.g. by-catch of non-target species, and vectors and introduction pathways for non-indigenous species. In light of this, COM Decision 2010/477/EU will continue to be revised in the future as greater knowledge and information becomes available, taking into account ongoing European and international work on indicators.

Compatibility and consistency of environmental targets

- 6.30 During the process of developing environmental targets it is advisable that consideration is given to compatibility with other existing national, regional and international obligations. Where environmental targets already exist consideration should be given as to whether they are appropriate for adoption. In some cases existing targets may go further or not far enough or may not be expressed in a way relevant to MSFD (e.g. different components or scale) and so may not be appropriate. A good example of this can be seen when considering current eutrophication obligations. The principles established under, for example, the WFD, OSPAR¹⁶ and HELCOM¹⁷ (BSAP) and BUCHAREST Convention (BS – SAP)¹⁸) are considered to be broadly aligned with the requirements of the MSFD. It could be considered, therefore, that the requirement under Descriptor 5 to minimise eutrophication would be fulfilled as long as the targets set out under the aforementioned are met. For this reason, these targets may be considered appropriate for adoption as MSFD environmental targets.
- 6.31 It should be noted that if it appears that GES will not be achieved as a result of adopting existing targets, modifications should be made and/or additional targets established to close any gaps as and when appropriate. An example for such a case is that, in general, good ecological status/potential of a water body (according to the Water Framework Directive) will contribute to the favourable conservation status of species and habitats in water-dependent Natura 2000 sites. Nonetheless, there are cases in which good ecological status/potential may not be sufficient to meet the specific objectives of Birds and Habitats Directives.¹⁹
- 6.32 Cooperation with landlocked Member States, using established cooperation structures in accordance with the third subparagraph of Art. 6(2) MSFD, such as the established River Conventions is particularly relevant. This concerns, for example, considerations that the concentrations of nutrients are related to nutrient loads from rivers in the catchment area, and that the abundance and distribution of long-distance anadromous and catadromous migrating species (e.g. sturgeon, salmon and eel) are related to continuities of rivers in the catchment area.
- 6.33 It will also be important to consider the consistency of environmental targets established for the MSFD and those in place as a result of other national and

¹⁶ 2010 North-East Atlantic Environment Strategy, http://www.ospar.org/documents/dbase/decrecs/agreements/10-03e_NEA%20Environment%20Strategy.doc

¹⁷ Baltic Sea Action Plan 2007, http://www.helcom.fi/BSAP/ActionPlan/en_GB/ActionPlan/

¹⁸ Black Sea Strategic Action Plan 2009, <http://www.blacksea-commission.org/bssap2009.asp>

¹⁹ Cf. example of WFD Biodiversity FAQ paper, http://circa.europa.eu/Public/irc/env/wfd/library?l=/framework_directive/implementation_conventio/biodiversity_legislation/faq-wfd-bhd_june2010doc/EN_1.0_&a=i

international obligations. This is crucial in order to ensure that targets are not working against each other, i.e. that there are no conflicts (Annex IV (4) MSFD).

Environmental targets - an iterative process

6.34 As previously referred to, the management cycle for the MSFD recognises that meeting the requirements of the Directive requires an adaptive management approach. Member States are required to establish a comprehensive set of environmental targets that, to the best of their current understanding, would ultimately result in the achievement or maintenance of GES. However, it is important to recognise that this is an iterative process and there are a number of reasons why the environmental targets set during the first management cycle may need to be revised in 2018 and beyond. These include the following:

- i). Changes in our understanding of what GES looks like, and thus what is needed to achieve or maintain it.
- ii). Changes in the types and levels of anthropogenic activities, including new and emerging pressures, e.g. carbon capture and storage, mineral mining.
- iii). Changes to the prevailing environmental conditions, e.g. through climatic variations.
- iv). Unexpected changes in environmental state, both positive and negative caused by management measures or other external factors.
- v). Emerging socio-economic constraints which make a target impossible to achieve in the original timescale envisaged.
- vi). New understanding allowing qualitative environmental targets to be developed into quantitative environmental targets and the development of new assessment tools.
- vii). Improved knowledge in pressure/impact relationship and ecosystem resilience and recovery.

6.35 In the first management cycle the available evidence base may not support the establishment of quantitative environmental targets, both as specific values or a definite order of magnitude e.g. for the reduction in pressure or impact needed. In these instances it may be more appropriate to set preliminary targets such as those reflecting an improving trend in state/pressure/impact in order that appropriate action can be taken without delay and the need for further development work can be flagged e.g. a decreasing trend in marine litter inputs

into certain marine regions/subregions or areas by 2020. The desired scale of such targets should be qualified in order to avoid a situation whereby a marginal change in status, pressure or impact would be perceived as having achieved GES. These preliminary targets can then be considered in conjunction with other Member States' environmental targets and revised or removed as appropriate development is undertaken. In effect, these preliminary environmental targets provide a general indication of the nature of the desired target in order to serve as a basis for the development of programmes of measures.

- 6.36 It may also be considered entirely appropriate to establish interim environmental targets which Member States believe can be realistically achieved by 2020 to help drive the implementation of management measures (example Annex 3 (3)). Such targets would reflect difficulties in achieving or maintaining GES by 2020 as a result of barriers such as time delays in environmental change, socio-economic constraints, or external influences from neighbouring countries. To ensure transparency, Member States should indicate where interim targets are being adopted and where further work is planned to improve accuracy of the target to achieve or maintain GES. Articulating interim environmental targets will allow Member States to assess their realistic progress towards achieving or maintaining the goal of GES in 2020 and to support the establishment of programmes of measures (see Figure 4).

The use of trends

- 6.37 In the absence of robust evidence, trends (both positive and negative) may be used in order to establish interim environmental targets. In this context, trends can be used as a means of ascertaining whether progress is being made towards achieving GES.
- 6.38 Increasing trends could be used when establishing environmental targets for certain state based aspects of GES, e.g. a positive trend in harbour porpoise populations. The use of decreasing trends might be more appropriate when establishing environmental targets for certain pressures and impacts, e.g. the risk of introduction of non-indigenous species, marine litter and noise.
- 6.39 The use of trends should be seen as an interim option until the evidence base supports the establishment of more quantitative environmental targets.

7. *An integrated approach to meeting the requirements of Articles 9 & 10 MSFD.*

7.1 The previous sections have covered some of the very broad principles attributable to meeting the requirements of specific Articles under the Directive. When considering the more practical aspects of implementation it becomes apparent that disregarding the somewhat artificial distinction between the two Articles significantly simplifies the understanding of the key steps and principles necessary to assess whether or not GES is being achieved. This section considers Art. 9 & 10 MSFD in combination, highlighting common approaches to meeting their requirements in more detail.

Practical steps in determining GES and establishing environmental targets

7.2 From a practical perspective the following common steps should be followed when developing a determination of GES and establishing associated environmental targets for coastal and marine waters under Art. 9 & 10 MSFD:

- 1) Identify criteria and respective indicators from the COM Decision 2010/477/EU relevant at a national and regional/subregional level.
- 2) For those criteria and indicators that are already developed, the threshold/limit/level at which GES can be considered to be achieved, i.e. the difference between GES and non-GES, should be set out qualitatively and/or quantitatively.
- 3) For those criteria and indicators which are of relevance, but are not yet developed (e.g. due to lack of methodologies), further development should begin, e.g. through research and monitoring.

7.3 In order to distinguish between GES and non-GES as referred to in step 2, the following should be considered appropriate:

- 1) Select a method for determining the baseline/reference level and for determining thresholds/levels/limits etc.
- 2) Articulate the threshold/level/limit where GES is achieved with reference to the chosen baseline (if this is not feasible then a qualitative threshold/limit/level should be set out).

7.4 In order to enable the applicability of the relevant criteria and indicators as referred to in step 2, or for future cycles in step 3, the following steps are considered appropriate:

- 1) Select the ecosystem component (i.e. the biotic and abiotic characteristics) relevant for GES characterisation (e.g. species, habitats, substances, etc.).
- 2) Select an appropriate scale.
- 3) Identify areas at risk of being adversely affected by anthropogenic pressures and impacts as described in Part A of COM Decision 2010/477/EU.
- 4) Develop the indicators in COM Decision 2010/477/EU on the basis of the previous choices (ecosystem component, units, scale).
- 5) Cross-check that there are no redundancies or incoherencies between Descriptors, criteria and indicators.

Establishing environmental thresholds/levels/limits

- 7.5 In order to articulate quantitatively what GES looks like and/or set appropriate environmental targets it will be necessary to define for each of the criteria and, where appropriate, the indicators in COM Decision 2010/477/EU, environmental boundaries or thresholds above or below which GES is considered to have been met. In effect, Member States should decide whether GES is being achieved/maintained or not in their marine waters. To that effect, a boundary between success and failure to achieve or maintain GES should be established. Thresholds/levels/limits in this sense represent that boundary between an acceptable and unacceptable status.
- 7.6 It is common to define a threshold/level/limit by reference to a baseline. The threshold/level/limit can either be the baseline itself (e.g. background concentrations for contaminants) or it can be defined as a deviation from the baseline (e.g. assessment levels for nutrients or eutrophication effect parameters). It is also possible in some cases to set a threshold/level/limit as an absolute value without making a reference to a baseline (e.g. fish size is xx cm). The baseline itself is a specific and quantifiable point against which subsequent assessments can be compared and from which a threshold/limit/level can be defined for GES as described above. Several approaches exist to the setting of baselines (e.g. under the WFD and Habitats Directive). These are explained briefly below and in more detail in *Annex 4*.
- a) Method A (unimpacted state/negligible impacts) - Baselines can be set as a state at which human pressures and their impacts on the marine environment are considered to be negligible. This state is also known as 'reference conditions' and is used in the Water Framework Directive. In this section, in order to be concise, this is referred to as 'reference/unimpacted state'. This can be determined through current or past measurements and/or modelling. This method is robust but requires a lot of data.
- b) Method B (past state) - Baselines can also be set as a state in the past, usually the point at which data collection on a specific characteristic of the marine environment began. It is necessary to know the level of pressure on the marine environment at that time in order to set the GES threshold/limit/level. This method is robust, but risks a 'shifting baseline', where succeeding generations adopt different definitions of what a 'healthy environment' is in relation to the past.

c) Method C (current state) - The date of introduction of an environmental directive or policy can also be used as the baseline state, the objective of the policy being typically expressed as no deterioration from this state. This method was used by several Member States for the Habitats Directive. This method should be used with precaution, especially when degradation has already occurred, as it may not meet the overall aims of the MSFD.

7.7 Since ongoing prevailing environmental conditions (and future changes to them) should be taken into account when determining GES and establishing environmental targets, it is important that they are also considered when setting the baseline. This allows the threshold/level/limit between the acceptable and unacceptable status to be set against a current and future scenario rather than one from the past which may never be achievable. This is reflected in Descriptor 1 which requires biodiversity to be 'in line with prevailing physiographic, geographic and climatic conditions' (i.e. not according to past conditions).

The use of expert judgement

7.8 Reference to expert judgement may be necessary to supplement other baseline-setting methodologies (particularly, method A), as opposed to being a distinct baseline setting technique in its own right. Quality assessment through a panel of experts is essential since confidence in the conclusions will increase with the number of experts consulted. Expert judgement could be particularly valuable in situations of incomplete scientific evidence and when it is necessary to account for changes in ecosystems over time. If expert judgement is to be relied on transparency and reproducibility/repeatability should be ensured, although the ultimate aim should be to develop and utilise tools which are independent of such elements and are reproducible to the greatest extent possible. In this process, and especially in the first cycle(s) of MSFD implementation, expert judgment is likely to be essential.

Coordination of GES determination and establishment of environmental targets

7.9 Member States' determinations of GES and environmental targets should be coordinated at a regional and subregional level (via Regional Sea Conventions or other forums), or, where appropriate, at a pan-European level (EU CIS) to the greatest extent possible. Two main steps can be identified when coordinating the determination of GES and establishing environmental targets. Firstly, coherence and comparability of methodologies used to determine GES and set environmental

targets, e.g. species chosen, should be ensured. Secondly, coherence between the determination of GES itself and the associated environmental targets e.g. ensuring a comparable limit between GES and non-GES in neighbouring marine waters.

- 7.10 Member States should ensure, to the best of their ability, that the methodologies through which they determine GES and establish environmental targets are coherent at a regional or, when relevant, pan-European level. Thus methodologies for choosing relevant ecosystem components and their associated thresholds/limits/levels, the identification of risk areas²⁰, and the selection of relevant baseline setting techniques should be discussed and agreed between Member States sharing a marine region or where possible at a pan-European level.
- 7.11 The development of indicators should also be undertaken at regional or subregional level wherever possible. Such activities should result in a 'core-set' of indicators appropriately coordinated at the regional/subregional level.
- 7.12 This does not mean that individual Member States' determinations of GES or environmental targets should necessarily be the same, since there will be differences in the characteristics of different marine waters and the types or intensity of pressure affecting them. It is essential that Member States ensure the general underlying approach taken and the state-, impact- and pressure-based aspects of GES are comparable.
- 7.13 Member States should proactively seek coherence beyond the Regional Seas fora with neighbouring countries employing bilateral/multilateral exchanges.
- 7.14 Work to be undertaken at regional level should, as much as possible, take place through the Regional Sea Conventions, in accordance with Art. 6 MSFD.

Co-ordination with Third Countries

- 7.15 Coordination and communication with Third Countries is essential. Coordination will help ensure that conflicting activities are not taking place and will allow for meaningful, practical and effective measures to be established. Without such coordination Member States run the risk that their attempts to achieve or maintain GES will be inadvertently countered by Third Country activities.
- 7.16 As stated in the Directive, already existing international structures, such as the Regional Sea Conventions, should be preferably used to coordinate the regional

²⁰ As described in part A of EU COM Decision 2010/477/EU

implementation of the Directive and be used as forums for communication between EU Member States and Third Countries.

7.17 A number of key steps can be identified which should help facilitate and enhance coordination and communication with Third Countries, for example:

- i). Establish appropriate channels of communication with key experts and policy makers.
- ii). Establish appropriate forums for exchange of information and discussion on scientific and policy aspects of achieving GES.
- iii). Establish pilot projects involving Member States and Third Countries which aim to address specific environmental issues potentially preventing the achievement of GES.
- iv). Use the framework of bi- and multilateral agreements.

7.18 See annex 5 for further detail on specific Regional Seas Convention activities.

Ensuring a consideration of socio-economic aspects

7.19 Art. 9 and 10 MSFD note that the determination of GES and establishment of environmental targets should be made by reference to, or based on, the initial assessment under Art. 8 MSFD, which include an economic and social analysis.

7.20 Regarding the determination of GES, the definition in Art. 3 MSFD clearly states that GES is a status which allows the sustainable use of marine goods and services. Therefore social and economic uses should be taken into account in determining GES.

7.21 With respect to the establishment of environmental targets, MSFD Annex IV (9) notes explicitly that social and economic aspects should be taken into account when setting environmental targets. But obligations which already exist under current EU legislation (e.g. under WFD, REACH, Nitrates Directive, Urban Waste Water Treatment Directive) must not be compromised with reference to Annex IV (9) MSFD.

7.22 It should also be noted that Art. 14 (4) MSFD on exceptions states that Member States are not required to take specific steps where disproportionate costs would be incurred, taking into account the risks to the marine environment and provided there is no further deterioration.

7.23 The various provisions of the MSFD mean, that socio-economic aspects are mentioned in relation to different stages of the decision making process such as

setting targets and justifying exemptions. This is in contrast to other EU legislation such as the WFD where socio-economic considerations are only relevant for applying exemptions. Care should be taken to avoid double-counting when considering socio-economic aspects in the decision making process under the MSFD.

7.24 Integrating social and economic aspects into the target setting process is challenging and, given the lack of current methodologies and guidance, Member States are likely to approach this in as pragmatic a way as possible during the first management cycle. WG ESA shall provide a platform where Member States can share experiences with respect to the integration of social and economic analysis in the next steps of MSFD implementation

8. *Future work: Towards a common assessment philosophy.*

8.1 The drafting group is of the opinion that there are several aspects foremost related to assessment (Art. 8 MSFD) and to the way the assessment framework could be better harmonised under MSFD for future assessments. Several important points were raised whilst discussing aspects of the initial assessment, GES determination and environmental target establishment which have been captured here and in more detail at *Annex 6*. It should be noted, however, that this is considered draft thinking which is open for further discussion in the future.

8.2 Art. 3 (4) MSFD defines 'environmental status' as *'the overall state of the environment in marine waters, taking into account the structure, function and processes of the constituent marine ecosystems together with natural physiographic, geographic, biological, geological and climatic factors, as well as physical, acoustic and chemical conditions, including from human activities inside or outside the area concerned'*. Based on this definition the drafting group felt it would be appropriate for Member States to consider further the need to develop an ecosystem-based assessment framework. This is, however, beyond the current scope of this document.

8.3 For this reason, it was deemed appropriate to raise the issue in order that it can help direct future work. The various issues for consideration are listed below and are further developed and described in *Annex 6*.

8.4 The following issues were deemed important by the drafting group for further reflection following discussions on a common understanding of Art. 8 MSFD:

- i). Approaches to assessing whether or not GES has been reached (e.g. distinction between state-based Descriptors (D 1, 3, 4 and 6) and pressure-based Descriptors (D 2, 5, 7, 8, 9, 10 and 11).
- ii). Options for aggregation between Descriptors to assess an overall status, with the possibility of grouping rather than aggregating Descriptors.
- iii). Options for aggregation within Descriptors at the level of criteria and indicators.
- iv). Need for more categories for reporting on GES, i.e. currently only two categories (GES/non-GES), including the possibility of incorporating trends.

Abbreviations

Art.	Article
BD	Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (codified version) (Birds Directive), OJ L 20/7, 26.1.2010
BSAP	Baltic Sea Action Plan (HELCOM)
BS-SAP	Strategic Action Plan for the Environment Protection and Rehabilitation of the Black Sea
CIS	EU Common Implementation Strategy (WFD and MSFD)
COM Decision	Commission Decision 2010/477/EU of 1 September 2010 on Criteria and Methodological Standards of Good Environmental Status, OJ L 232/14, 2.9.2010.
D (D1, D2 ...)	Descriptor 1, 2 etc. of Annex I to the MSFD
EAC	Environmental Assessment Criteria (OSPAR)
EQS	Environmental Quality Standards (WFD)
EU	European Union
GES	Good Environmental Status
GFCM	General Fisheries Commission for the Mediterranean
HD	Council Directive (92/43/EEC) of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (Habitats Directive)
HELCOM	Helsinki Commission established under the 1992 Helsinki Convention on the Protection of the Marine Environment of the Baltic Sea Area
HOLAS	Holistic assessment of the Baltic marine environment, including a thematic assessment of hazardous substances (HELCOM)
ICES	International Council for the Exploration of the Sea
JRC	EU Joint Research Centre
MSFD	Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive), OJ L 164/19, 25.6.2008
ND	Council Directive 91/676/EEC concerning the protection of waters against pollution caused by nitrates from agricultural sources (Nitrates Directive)
OSPAR	OSPAR Commission and the 1992 OSPAR and Paris Convention for the Protection of the Marine Environment of the North-East Atlantic
QSR	Quality Status Report (OSPAR, TWSC)
TWSC	Trilateral Wadden Sea Cooperation
UNCLOS	United Nations Convention on the Law of the Sea
WFD	Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy (Water Framework Directive), OJ L 327, 22.12.2000
WG ESA	EU Working Group on Economic and Social Analysis (MSFD)
WG GES	EU Working Group on Good Environmental Status (MSFD)

Annex 1 - Glossary of terms

This expanded glossary includes MSFD terms (indicated with a star - *) that are relevant for a common understanding of the implementation of the MSFD, but are not subject of this guidance document on a common understanding of Art. 8, 9 and 10 MSFD.

‘Assessment’

For the purpose of the MSFD, an assessment can be considered either as a process or a product. As a process, an assessment is a procedure by which information is collected and evaluated. It is carried out from time to time to determine the level of available knowledge and to evaluate the environmental state. As a product, an assessment is a report which synthesises and documents this information, presenting the findings of the assessment process, typically according to a defined methodology, and leading to a classification of environmental status. Art. 8 MSFD sets out the elements that need to be analysed in an assessment, whilst the Commission Decision provides the criteria for assessment of each of the eleven descriptors of GES.

‘Baseline’

From an assessment perspective, a baseline is a description of state at a specific point against which subsequent values of state are compared. It can equally refer to a specified level of an impact or a pressure. Baselines act as yardstick against which thresholds can be set or trends for Good Environmental Status (GES) can be assessed. Baselines can be derived from (i) historical state (often termed reference condition), (ii) a known state in the past, such as the beginning of a data time series, (iii) the present state or (iv) potential state (a predicted state in the absence of pressures).

‘Characteristics’

For the purpose of the Marine Directive, the term 'characteristics' is used in the meaning of:

- a. Ecosystem components (physical and chemical features, habitat types, biological features and other features) relevant for analysing the environmental state as described in Annex III, Table 1 MSFD;
- b. Considerations to be taken into account for the setting of environmental targets as described in Annex IV MSFD;
- c. Elements describing GES as set out in Art. 9(1) MSFD (characteristics of GES).

‘GES criteria/criterion’

According to the definitions in Art. 3(6) MSFD, “criteria” mean “distinctive technical features that are closely linked to qualitative descriptors”. Specific criteria are listed for each GES Descriptor in Part B of Annex 2 in COM Decision 2010/477/EU. For this reason GES criteria refer to those aspects which are to be assessed, through the application of appropriate indicators, to determine whether GES is being achieved.

Examples of criteria include:

- Criterion 1.1 “Species Distribution” of a relevant species for Descriptor 1 “Biological Diversity is maintained...”
- A representative example for a pressure-related descriptor is criterion 5.2 “Direct Effects of Nutrient Enrichment” for Descriptor 5 “Eutrophication”.

To avoid confusion between the use of the term “criteria” in this specific context and its use in other respects (such as criteria used to guide indicator selection), it is recommended that these specific criteria be referred to as “GES criteria”.

'Cost of degradation'*

The cost of degradation refers to the efforts/costs needed to reduce environmental impacts to a level which achieves GES or to the welfare foregone, reflecting the reduction in the value of the ecosystem services provided compared to another state.

'Degradation'*

Degradation is the reduction in the quality status of the ecosystem, or any part of it, or in the provision of ecosystem services compared to a more healthy state.

'Descriptor'

Annex I MSFD provides a list of eleven qualitative 'Descriptors' which constitute the basis for the assessment of GES, and provide a further refinement of aspects of the definition of GES in Art. 3(5) MSFD. These descriptors are substantiated and further specified in the COM Decision 2010/477/EU through a set of 29 criteria and 56 indicators.

'Drivers'*

Drivers are those factors (human activities and uses of the marine environment or management and policies) which induce pressures on the environment, such as agriculture, fishing, subsidies or regulation, and which may subsequently change an aspect of the ecosystem. It is important to identify relevant drivers when looking into different policy options and measures to reduce pressures (in order to achieve or maintain GES).

'Ecosystem approach'

The main elements of the ecosystem approach can be described, as defined for example in the 2003 Joint HELCOM and OSPAR Statement on the ecosystem approach to the management of human activities²¹, as the comprehensive integrated management of human activities based on best available scientific knowledge about the ecosystem and its dynamics, in order to identify and take action on influences which are critical to the health of the marine ecosystems, thereby achieving sustainable use of ecosystem goods and services and maintenance of ecosystem integrity.

'Ecosystem component'

Ecosystem components comprise abiotic and biotic components of the marine environment, including those described in Annex III, Table 1MSFD. Abiotic components include non-living physical, hydrological and chemical factors. Biotic components include species, functional groups and habitat types.

'Ecosystem services'*

Ecosystem services are defined as goods and services – benefits – that the ecosystem provides to human beings (MEA, 2005). Ecosystem services contribute to economic welfare in two ways – firstly, through contributions to the generation of income and well-being, and secondly through the prevention of damages that inflict costs on society. The latter is characteristic of certain ecosystem services that provide insurance, regulation and resilience functions.

Ecosystem services can be separated into final and intermediate services:

²¹ http://www.ospar.org/documents/02-03/JMMC03/SR-E/JMM%20ANNEX05_Ecosystem%20Approach%20Statement.doc

‘Intermediate marine ecosystem services’

Intermediate services are those that, in a supporting or regulating way, enable the final services and thereby influence human well-being indirectly, such as habitats and mitigation of eutrophication.

‘Final marine ecosystem services’

Final services are those that directly generate a benefit to humans, such as fish-stocks for fishing, water clarity for bathing.

‘Environmental Target’

‘Environmental target’ is defined in Art. 3 MSFD as qualitative or quantitative statement on the desired condition of the marine ecosystem and its components and the pressures and impacts on them. They are inter alia a specific requirement to describe progress towards GES. MSFD Annex IV contains a list of characteristics to be considered if environmental targets are established and distinguishes four categories of environmental targets such as establishing desired conditions, being measurable with associated indicators allowing for monitoring and assessment and being operational relating to concrete implementation of measures to support their achievement and move towards GES.

‘Environmental threshold/level/limit’

In the context of the Marine Directive, environmental thresholds/levels/limits are used to define the boundary between an acceptable and unacceptable environmental status (GES or sub-GES).

‘Functional groups of species’

As a way of simplifying and categorising biodiversity, species can be assigned to functional groups. Such groups comprise species with similar structural and functional characteristics, such as how they acquire their nutrients, their state of mobility or their mode of feeding.

Each functional group represents a predominant ecological role (e.g. offshore surface-feeding birds, demersal fish) within the marine environment or within a habitat. For MSFD purposes, the term is particularly applied to birds, mammals, reptiles, fish and cephalopods to provide focus for the assessment of status of these often highly mobile or widely-dispersed species groups. The term is also useful in the context of assessing communities condition (in the water column or seabed) through assessment of the range of functional groups present.

‘Good Environmental Status’

GES is defined in Art. 3 MSFD and describes the desired status of the marine environment and its components. The determination is based on the list of eleven Descriptors laid down in Annex I MSFD and on the criteria and associated indicators in COM Decision 2010/477/EU.

‘Hydrographical conditions’

Hydrographical conditions refer to the depth, tidal, current and wave characteristics of marine waters, including the topography and morphology of the seabed.

‘Hydrological processes’

Hydrological processes refer to the movement, distribution and quality of water. Interference with hydrological processes can encompass changes in the thermal or salinity regime, in the tidal regime, in sediment and freshwater transport, in current or wave action and in turbidity. Hydrographical conditions can be influenced by (changing) hydrological processes.

'Impact'

From an environmental perspective, an impact is the environmental effect of a pressure resulting from human activities. It is an alteration, whether permanent or temporary, in a physical, chemical or biological aspect of the environment that is considered undesirable.

From a socio-economic perspective, impacts are the consequences for human welfare based on the use of the marine environment, caused by the drivers and pressures affecting the state of the marine environment.

'Indicator'

An indicator is a parameter chosen to represent (indicate) a certain situation or aspect and to simplify a complex reality. Indicators are intended to help simplify a complex reality. In the context of the implementation of the MSFD, indicators are specific attributes of each GES criterion that can be measured to make such criteria operational and which allow subsequent change in the attribute to be followed over time.

Given the complexity of the GES descriptors, both in their range of characteristics and number of aspects that contribute to an assessment of state, it is common practice to use a set of indicators to assist in monitoring and to simplify assessment. Generally, there is a variety of indicators falling under three types: state, pressure and impact.

For Descriptor 3, two types of indicator are described in COM Decision 2010/477/EU. The 'primary indicator' (for fishing activities) which is the preferred indicator to be used. If this is not possible, for instance because analytical assessments are not available, the 'secondary indicator' can be used.

'Index'*

An index is a statistic, which represents the aggregated measurement, or calculated derivative of several different 'parameters', usually determined across different biodiversity components. In ecology, indices are frequently used to inform on biological variety in any given area or point in time. The degree of variety can be assessed on various levels, e.g. at the level of genes, species, communities or habitats.

'Listed features'*

Listed features are species or habitat types which are listed under Community legislation (e.g. Birds and Habitats Directive) or regional conventions (e.g. OSPAR & HELCOM). Table 1 of Annex III MSFD refers to these habitat types as 'special'.

'Methodological standard'

Method to monitor or assess the indicator to be used by the Member State and which ensures consistency and allows for comparison between marine regions or subregions of the values and results of the indicator. These standards will help ensure consistency across Member States in their assessment of the extent to which good environmental status is being achieved.

'Parameter' / 'metric'

A parameter or metric is a measurable single characteristic. It might comprise a species or habitat (e.g. number of individuals, biomass in g/dry weight, sediment particle diameter size in mm). Parameters of this nature can be used as simple indicators (e.g. indicator 1.2.1, population biomass in COM Decision 2010/477/EU).

‘Pressure’

A pressure can be described as a change, due to anthropogenic activities, in a physical, chemical or biological characteristic of the environment compared with background levels. A pressure, at particular levels of intensity, has the potential to have a direct or indirect impact on any part of the ecosystem. For example, the introduction of non-indigenous species in the natural environment as a consequence of human activities (such as shipping or aquaculture) provides a pressure on the native biodiversity. When such species become abundant within habitats, they can alter the structure and functioning of the habitat and its native biodiversity and thus be considered to be causing an impact.

‘Reference state’ / ‘Reference conditions’

For assessment purposes, it is often necessary to define a reference point (baseline) against which current and future state is compared. Reference state/condition is one type of reference point. It plays a central role in the concept of the Water Framework Directive (WFD) and other environmental assessment tools (e.g. HELCOM's HEAT system). Reference conditions describe the state of the environment (or a component) in which there is considered to be no, or very minor, disturbance from the pressures of human activities. It is common in such assessment systems to then define an 'acceptable deviation' from this reference state to allow for a specified level of disturbance from the pressure(s) and hence to define the boundary between an acceptable state (GES) and an unacceptable state (sub-GES).

‘Resilience’

From an ecological perspective, resilience means the ability of an ecosystem to return to its original state after being disturbed.

‘Scale’

The spatial and temporal order of ecosystem components, their assessment and good environmental status.

‘Scenarios’*

Scenarios are projections of future states of society and the environment, based on specific assumptions about key drivers, such as human population, economic growth, technological change or environmental policies.

‘Socio-economic analysis’*

A socio-economic analysis aims to identify the impact on human welfare of a given policy. This includes economic as well as social aspects, and may include consideration of the distribution of these impacts across stakeholders. In light of this definition, an explicit distinction between economic and social analysis is not necessary.

‘State/status’

The word ‘state’, as used in the context of the MSFD, refers to the quality/condition of specific aspects of the environment, such as ecosystem components. This can be determined through measurements in the environment of relevant parameters for such components; such measurements, by definition, will reflect any impacts (individual and cumulative) to which the component has been subjected.

The word ‘status’, as used in the context of Good Environmental Status or Environmental Quality Status, draws together the determination of the ‘state’ of individual ecosystem components, typically through use of particular criteria, threshold values and indicators, to assign a ‘status’

classification (e.g. at GES, below GES). For WFD five classes are used, for Habitats Directive three classes are used. 'Status' can either be applied to the overall quality/condition of the marine environment, at the level of the individual descriptors of GES or at the level of individual functional groups, habitats, species or populations.

A further distinction is necessary when referring to the term 'state target'. In this context, the meaning is limited specifically to targets which articulate the desired quality/condition of specific ecosystem components or characteristics.

'Marine waters'

For the purpose of the MSFD, marine waters are those defined in Art. 3 (1) MSFD as:

- a) waters, 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 UNCLOS, with the exception of waters adjacent to the countries and territories mentioned in Annex II to the Treaty and the French Overseas Departments and Collectivities; and
- b) coastal waters as defined by Directive 2000/60/EC, their seabed and their subsoil, in so far as particular aspects of the environmental status of the marine environment are not already addressed through that Directive or other Community legislation.

'Use of marine waters'*

The use of marine waters is defined as any human activity using or influencing the marine environment and/or influencing ecosystem goods and services provided by marine waters.

'Use value' and 'Non-use value'*

The use value, both direct and indirect, captures the direct link between ecosystem services and human welfare. Direct use value includes the profits of fishers and the oil and gas industry etc. ("economic" value) and wider benefits that are more difficult to measure (for example recreational activities such as swimming, fishing, scuba diving etc., as well as the importance to local coastal communities of maintaining their marine heritage ("social" value). Indirect use value includes the benefits we derive from the environment's provision of ecosystem services such as waste decomposition or carbon sequestration. The non-use value includes 'bequest' and 'existence' values. It entails, for example, the importance people attach to knowing that a healthy sea surrounds them and that this resource may be passed on to future generations.

Annex 2 - Possible examples of targets

The following table randomly presents some made-up examples of possible targets. The examples are presented solely for illustration purposes in order to help understanding the nature of a specific type of target and its relationship to potential measures. They are not intended to be exhaustive or prescriptive and are not necessarily consistent with the achievement of GES. The assignment of an example to the one or the other target category or the distinction between operation target and measure can be fluent, depending on the approach and the issue at hand. As described in section 6.5 and Figure 6 above, there are many possible combinations for target setting, all depending on the particular issue and knowledge available. The examples presented are based on current knowledge. It can be assumed that this section would look different after Member States will have reported their environmental targets in 2012.

Descriptor examples	State	Pressure	Impact	Operational	Measure
D5	Nutrient concentrations do not lead to an undesirable disturbance to the balance of organisms present in the water or to the quality of the water concerned resulting from accelerated growth of algae	Anthropogenic inputs of nutrients are reduced.	No kills in benthic animal species as a result of oxygen deficiency related to anthropogenic input of nutrients	Limit the total contribution of the different sources to nutrient enrichment by %' (or as pressures target)	Prevent livestock from fouling rivers through appropriate fencing and movement controls Reduce inputs of N and P from diffuse sources. Reduce inputs of P (e.g. via urban waste water) resulting from the use of detergents.
D8	Concentrations of contaminants identified within relevant legislation and international obligations are below the concentrations at which adverse effects are likely to occur (e.g. are less than EQS within WFD; EACs within OSPAR)	Anthropogenic inputs of contaminants are reduced.	Biological effect responses to contaminants should fall below the "high and cause for concern" level as defined by ICES/OSPAR assessment criteria (ICES, 2009, 2010, 2011)	The atmospheric deposition of identified contaminants should be reduced by x%. (or as pressure target)	Emissions scrubbing of PAHs from combustion processes in xx industry are to be limited to x%. (or as operational target)
D11	Anthropogenic noise should be at levels which do not significantly affect or interfere with the health of	The proportion of days in which anthropogenic sound sources exceed x dB should not exceed x % in a calendar	The cumulative input of noise from peak and continuous noise sources are reduced to levels below	All developments generating potentially damaging levels of impulsive sounds to adopt best available technology	Soft start techniques employed on all developments utilising pile driving

	the marine ecosystem.	year or an average of x pulse days per year per block.	which impact on marine cetaceans is measured. (also D1)	and best practice in order to minimise risks to marine life Establish a noise registry to record in space and time impulsive sounds by 2020 (or as a measure)	
D1, D4	Marine mammal populations will be maintained (in the long-term) at no less than 80% of carrying capacity (D1, D4)		Annual by-catch of harbour porpoises should be reduced to below 1.7% of the best population estimate (D1, D4))	Ensure measures are in place in the fishing industry to tackle the causes of cetacean by-catch.	Ban specific types of fishing gear with high by-catch rates (D1, D4).
D10	Marine litter does not harm marine mammals	Inputs of litter are measurably reduced	Reduction of litter amounts and composition of litter digested by marine animals	x % of plastic is recycled annually Facilities to support fishing for litter scheme in all ports and harbours by 2020 (or as a measure)	Set up recycling regimes for industry x, y and z by 20xx Introduce plastic bottle deposit and collection systems Fishing for litter

Annex 3 Practical examples of the different approaches to implementing Articles 9 & 10 MSFD.

Approach 1.

Approach 1 consists of a qualitative description of what GES looks like when achieved for each Descriptor (Art. 9 MSFD) underpinned by detailed quantitative environmental targets (Art. 10 MSFD).

Art. 9 MSFD - A Determination of GES for Descriptor 5 (Eutrophication)

Characteristics of GES.

Human induced eutrophication is minimised, especially the adverse effects thereof, such as losses in biodiversity, ecosystem degradation, harmful algal blooms and oxygen deficiency in bottom waters

Good Environmental Status for human induced eutrophication is determined on the basis of the following characteristics derived from COM Decision 2010/477/EU:

- **Criterion 5.1.** Nutrient concentrations do not lead to an undesirable disturbance to the balance of organisms present in the water or to the quality of the water concerned resulting from accelerated growth of algae; and
- **Criterion 5.2.** The direct effects of nutrient enrichment associated with algal growth do not constitute or contribute to an undesirable disturbance to the balance of organisms present in the water and to the quality of the water concerned ; and
- **Criterion 5.3.** Indirect effects of nutrient enrichment associated with growth of macroalgae, sea grasses, and reductions of oxygen concentrations do not constitute an undesirable disturbance to the balance of organisms present in the water and to the quality of the water concerned.

Approach to GES Determination.

Good Environmental Status will be achieved in relation to this descriptor when human induced eutrophication is minimised, especially the adverse effects thereof, such as losses in biodiversity, ecosystem degradation, harmful algal blooms and oxygen deficiency in bottom waters. The UK characterisation of GES for human induced eutrophication is based on the following three criteria from Commission Decision 2010/477/EU. **Criterion 5.1** (nutrient concentrations) and associated indicators²² enables an assessment of whether nutrient enrichment is taking place. **Criterion 5.2** (Direct effects of nutrient enrichment) and associated indicators ²³ combined with **Criterion 5.3** (indirect effects of nutrient enrichment) and associated indicators ²⁴ enables

²² 5.1.1 (nutrient concentrations in the water column) and 5.1.2 (nutrient ratios).

²³ - Chlorophyll concentration in the water column (5.2.1)
- Water transparency related to increase in suspended algae, where relevant (5.2.2)
- Abundance of opportunistic macroalgae (5.2.3)
- 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 (5.2.4)

²⁴ - Abundance of perennial seaweeds and seagrasses (e.g. fucoids, eelgrass and Neptune grass) adversely impacted by decrease in water transparency (5.3.1)
- Dissolved oxygen, i.e. changes due to increased organic matter decomposition and size of the area concerned (5.3.2).

an assessment of whether nutrient enrichment is leading to accelerated growth and an undesirable disturbance to the balance of organisms present and to the quality of the water concerned²⁵.

The definition of eutrophication in the Urban Waste Water Treatment Directive 91/271/EEC²⁶ and the Guidance document No 23 on Eutrophication Assessment in the Context of European Water Policies will be used to underpin the determination of eutrophication status.

OSPAR has developed a robust eutrophication assessment methodology (the Comprehensive Procedure) based on these definitions, guidance and criteria, including a harmonised approach to thresholds for the associated indicators. Intended modifications to this procedure will ensure it remains tailored for use under the MSFD and as such it will be used to carry out future assessments of eutrophication status for marine waters. This will ensure a coordinated approach across the marine regions in the NE Atlantic. For coastal waters, we will also use the relevant WFD assessment tools to assess status which are also aligned with the three criteria in the Commission Decision.

A risk-based approach, based on the findings of the initial assessment will be used in order to identify areas which require monitoring. For areas identified as having eutrophication problems the relevant indicators from the Commission Decision will be used, whereas for those where there were no problems identified, appropriate indicators and targets will be selected which can demonstrate that non-problem area status is maintained.

Current Status.

On the basis of the initial assessment it can be concluded that eutrophication is not a significant problem at the scale of the marine regions/sub-regions for country X. However, there are some small eutrophication problem areas in WFD coastal waters and in a small number estuaries and embayments, largely in WFD transitional waters. The initial assessment findings for marine waters were based largely on commonly agreed methodology developed in OSPAR for the NE Atlantic.

Art. 10 MSFD - Environmental Targets for achieving GES for Descriptor 5 (Eutrophication)

The following table lays out a potential suite of eutrophication targets for the achievement of GES. These underpin the quantitative determination of GES and reflect the Commission Criteria and Indicators as appropriate.

It should be noted that failure to achieve all the targets may not necessarily result in a failure to achieve GES for this descriptor given the holistic nature of the assessment necessary to determine whether eutrophication is occurring.

²⁵ *Undesirable disturbance is demonstrated when adverse effects resulting from nutrient enrichment and accelerated growth of algae occur, such as losses in biodiversity, ecosystem degradation, harmful algal blooms and oxygen deficiency in bottom waters*

²⁶ *(cf. Art. 2(11) of the UWWT Directive 91/271/EEC): the enrichment of water by nutrients, especially compounds of nitrogen and/or phosphorus, causing an accelerated growth of algae and higher forms of plant life to produce an undesirable disturbance to the balance of organisms present in the water and to the quality of the water concerned".*

Commission Indicator	Proposed target	Evidence base	Link to anthropogenic pressure	Existing or new target	Compatible with existing legislation	Compatible with other Descriptors	Regional Coordination	Monitoring implications	Operational now/further development
5.1.1 - Nutrient concentrations in the water column	Non-problem areas - No increase in the assessed dissolved inorganic nitrogen and phosphorus concentration, resulting from anthropogenic nutrient input using data from periodic surveys.	Strong	Yes	Existing (OSPAR)	Yes	Yes	Yes (consistent with OSPAR advice)	Minimal - current monitoring programme to be reviewed.	Operational now
	Problem areas - A decreasing trend in dissolved organic nitrogen and phosphorous concentration, resulting from anthropogenic nutrient input over a 10 year period.								
5.1.2 - Nutrient ratios (silica, nitrogen and phosphorus), where appropriate.	<i>* no specific target proposed however monitoring information is used when determining whether eutrophication is occurring.</i>	Strong	Yes	N/A	Yes	Yes	Yes (consistent with OSPAR advice)	Minimal - current monitoring programme to be reviewed	N/A
5.2.1 - Chlorophyll concentration in the water column/	Non-problem areas - No increase in the chlorophyll 90 percentile in the growing season (linked to increasing anthropogenic input) based on periodic surveys.	Strong	Yes	Existing (OSPAR)	Yes	Yes	Yes (consistent with OSPAR advice)	Minimal - current monitoring programme to be reviewed.	Operational now

	Problem areas - A decreasing trend in the chlorophyll 90 percentile in the growing season over a 10 year period (linked to decreasing anthropogenic input)								
5.2.2 - Water transparency related to increase in suspended algae, where relevant	<i>* No target proposed due to difficulties in interpreting such data in UK waters.</i>	Strong	No	N/A	Yes	Yes	Yes (consistent with OSPAR advice)	Minimal - current monitoring programme to be reviewed	N/A
5.2.3 - Abundance of opportunistic macroalgae	Problem & Non-problem areas - WFD opportunistic macroalgae tool at good status.	Strong	Yes	Existing (WFD)	Yes	Yes	Yes (consistent with OSPAR advice)	Minimal - current monitoring programme to be reviewed.	Operational now
5.2.4 - Species shift in floristic composition such as diatom to flagellate ratio, benthic to pelagic shifts, as well as bloom events of nuisance/toxic	Non-problem areas - <i>If there is evidence of nutrient enrichment and accelerated growth, then</i> - no trend in a eutrophication relevant plankton index that is attributable to increases in nutrient loading, winter nutrient concentrations or trends in nutrient ratios.	Strong	Yes	Existing (OSPAR)	Yes	Yes	Yes (consistent with OSPAR advice)	Minimal - current monitoring programme to be reviewed.	Operational now

<p>algal blooms (e.g. cyanobacteria) caused by human activities</p>	<p>Problem areas - Changes in a eutrophication relevant plankton index that is attributable to decreases in anthropogenic nutrient loading, winter nutrient concentrations or trends in nutrient ratios.</p>								
<p>5.3.1 - Abundance of perennial seaweeds and seagrasses (e.g. fucoids, eelgrass and Neptune grass) adversely impacted by decrease in water transparency</p>	<p>Problem & Non-problem areas -To achieve or maintain good status using the WFD macroalgae and seagrass tools.</p>	<p>Strong</p>	<p>Yes</p>	<p>Existing (WFD)</p>	<p>Yes</p>	<p>Yes</p>	<p>Yes (consistent with OSPAR advice)</p>	<p>Minimal - current monitoring programme to be reviewed.</p>	<p>Operational now</p>

<p>5.3.2 - Dissolved oxygen, i.e. changes due to increased organic matter decomposition and size of the area concerned</p>	<p>Problem & Non-problem areas -Oxygen concentrations (5 percentile) in bottom waters should remain above area-specific oxygen assessment levels (likely to be in the range of 4 – 6 mg/l) and there should be no kills in benthic animal species as a result of oxygen deficiency that are directly related to anthropogenic input of nutrients.</p>	<p>Strong</p>	<p>Yes</p>	<p>Existing (OSPAR)</p>	<p>Yes</p>	<p>Yes</p>	<p>Yes (consistent with OSPAR advice)</p>	<p>Minimal - current monitoring programme to be reviewed.</p>	<p>Operational now</p>
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Approach 2

Approach 2 consists of a qualitative and/or quantitative description of environmental thresholds/limits of GES (Art. 9 MSFD) underpinned by detailed quantitative pressure and impact targets (Art. 10 MSFD).

Determining GES and setting environmental targets for Descriptor 5 (Eutrophication)

In an overview, this approach defines GES through COM Decision 2010/477/EU criteria and indicators with their quantitative thresholds, which determine the boundary between GES and sub-GES, and taking account of Table 1 of Annex III to the MSFD. The basis is existing assessment frameworks, including European and regional assessment frameworks, which provide common approaches to indicators, thresholds and assessment procedures. GES defines the desired status in this respect with regard to eutrophication. Comparison of the current status and the desired “good” status shows whether a difference between the two exists. If so, establishment of respective environmental targets is required to move towards achieving GES. If GES is achieved still measures might be necessary to fulfil the other requirement of the MSFD to maintain GES. The environmental target is defined as a broad qualitative statement which is underpinned by a set of qualitative and quantitative operational targets and associated indicators, taking account of Table 2 of Annex III to the MSFD. They mainly link to pressures as the main tool to help improving environmental quality, i.e. reducing the distance between current and desired status. Figure 1 provides an example for Descriptor 5 (eutrophication) in relation to the North Sea how initial assessment (Art. 8 MSFD), GES (Art. 9 MSFD) and environmental targets (Art. 10 MSFD) link together and illustrates where quantification takes place.

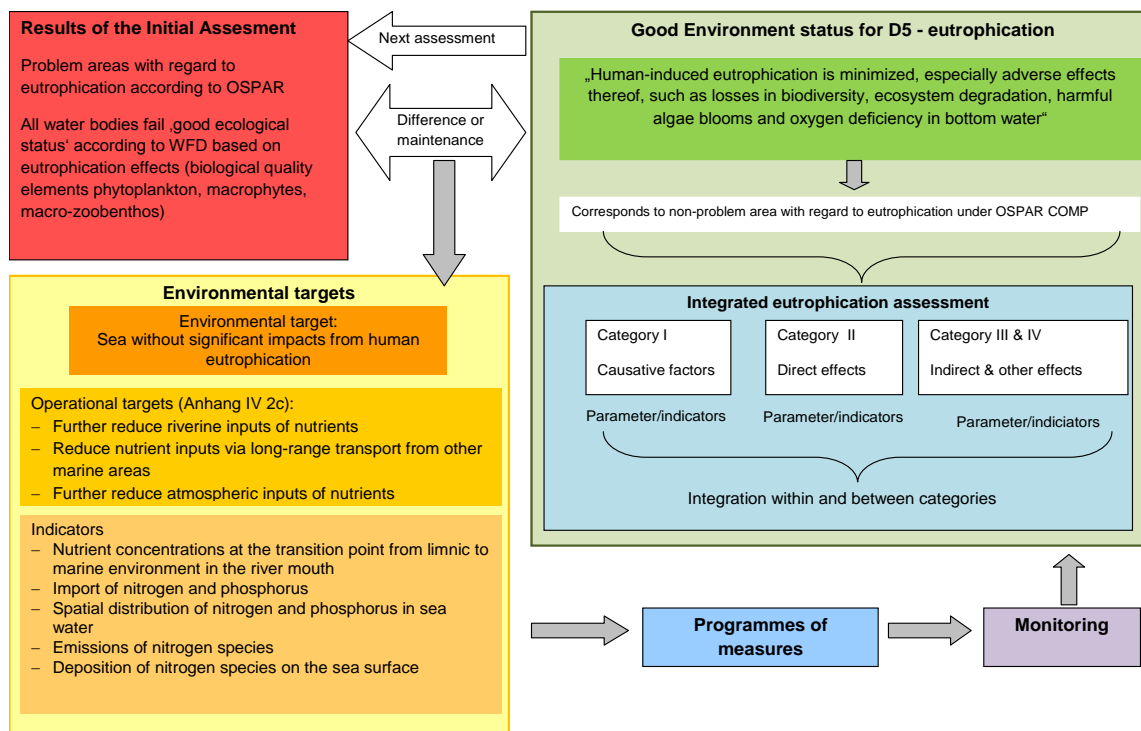


Figure 1 Overview of assessments, good environmental status and environmental targets and their interactions

Initial assessment 2012 (Article 8 report)

Description of the eutrophication status for the German Baltic and North Sea regions (including the Wadden Sea) based on the results of corresponding studies by HELCOM, OSPAR and TWSC, and incorporation of the relevant results from the assessment of coastal waters in accordance with the WFD.

GES (Article 9 report)

Description of good environmental status with regard to eutrophication, based on the quantitative, regional-specific values that were derived for the assessment of eutrophication under the aforementioned legal regimes (such as nutrient loads of rivers, discharges of atmospheric nitrogen and deposition, nutrient concentrations and ratios in the ocean, chlorophyll levels, visibility depths, abundance of phytoplankton indicator species, abundance of opportunistic macroalgae, species shifts in the flora composition (such as ratio of diatoms to flagellates, impairment to the abundance of perennial algae (such as brown algae) and seagrass, oxygen levels).

Environmental targets (Article 10 report)

North Sea and Baltic Sea without significant anthropogenic eutrophication in accordance with the OSPAR strategy, HELCOM BSAP, MSFD, TWSC (ecological quality objectives for the Wadden Sea) and WFD (for coastal waters).

Reduction targets for nutrient discharges via the relevant discharge pathways (water (rivers and direct discharges), atmosphere and currents from surrounding or more remote marine regions) from the perspective of the relevant "eutrophication problem areas".

Approach 3

Considerations for realistic state target setting (NL example)

Dilemma: how to deal with limited and unknown effectiveness of management action?

Considerations for setting realistic targets for state

The Dutch part of the North Sea is heavily used, relative to other parts of the subregion. The main activities are being regulated through existing legislation at the national and international level. Political and socio-economic drivers for uses at sea are expected to remain and there is a need to set realistic targets for Good Environmental Status and avoid duplication with existing legislation. We therefore defined a limited number of areas where the MSFD can have added value, keeping in mind our dependence on management action in MS sharing the same subregion and our limited jurisdiction at sea.

The MSFD calls for protection and where possible restoration of marine ecosystems, whilst ensuring sustainable use and following the ecosystem based approach to management of human activities. In our interpretation ecosystem status is primarily reflected by Descriptors 1, 4 and 6, which is supported by the other status/impact Descriptors and influenced by the remaining pressure-related Descriptors. According to the Dutch Initial Assessment, and in line with the OSPAR QSR 2010, many of the relevant ecosystem elements seem to be below GES, as described in Art. 3.5.

GES is considered an aspirational aim and it is expected that not all ecosystem elements will be in good status by 2020. This is partly due to the slow response time of marine ecosystems to management action. In addition, and more importantly, quantitative links between pressure and status/impact remain largely unknown. Therefore, we have limited understanding of the effectiveness of management action, and how this can be distinguished from 'natural' ecosystem dynamics, including climate change. Cost effectiveness of measures is even more difficult to define and our estimates have large uncertainties, hampering acceptance by politicians and stakeholders.

Target setting for ecosystem state is a normative exercise, having limited scientific basis. An ecosystem at GES does include human uses and may therefore deviate from 'pristine state'. To which extent this deviation is acceptable, is essentially a political choice, that is driven by our analysis of what we realistically could achieve by current and additional management action, and informed by science. Taking into account the slow response time of ecosystems we aim for reaching GES between 2020 and 2030. Reference conditions are currently hard to find in Dutch waters and are considered less useful for baseline setting. Target setting will be an iterative process, to take into account future developments that are yet unknown, which is in line with adaptive management.

We agree that targets for the MSFD must be consistent with, and build upon, existing targets in other relevant legislation and regional agreements, although the scope of these policies only partly overlap the scope of the MSFD, from a legal and geographical point of view. Many of these existing targets have been developed in an international context and therefore provide a common language and options for coordinated monitoring and assessment.

Proposed approach for state targets

- GES to be defined in qualitative terms at the level of Descriptors, cf. Art. 3.5 (definition of GES), and taking into account Dutch circumstances. We set realistic goals which we

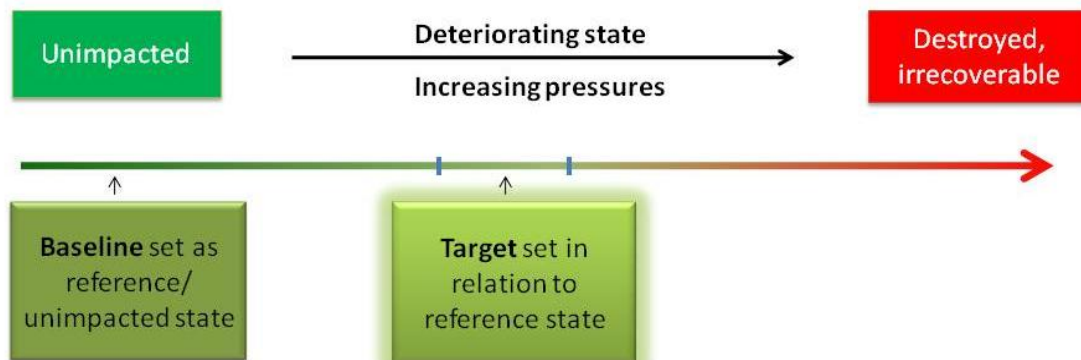
expect to achieve between 2020-2030, while focusing on the main disturbances and threats for ecosystem functioning and taking into account existing policy frameworks;

- Environmental targets relating to COM DEC Criteria are set at a level that can be realistically achieved by 2020 (interim target). These targets can be aggregated targets, *ie.* consist of a limited set of concrete and measurable indicators and related assessment levels (example: XX% of indicators for [Criterion] meet their respective assessment levels by 2020) *or* they can refer to single indicators. Where we cannot set targets in relation to a baseline we develop trend targets;
- Indicators are taken from existing frameworks (WFD, BHD, OSPAR), where these support the aims of the MSFD and sufficiently relate to ecosystem functioning. In concordance with OSPAR, the associated targets will be regarded as *assessment criteria* to monitor progress towards GES. They will not have a legal status in the form of environmental standards such as limit values. Additional indicators are being proposed at national level, but need to be coordinated with MS sharing the same subregion (*ie.* North Sea). This coordination process will continue post 2012 within OSPAR and with neighbouring MS.

Annex 4 Setting baselines²⁷

3.3.1 The three baseline setting methods are described in detail below.

Method A - Baseline as a state at which the anthropogenic influences are considered to be negligible



3.3.2 There are three options for setting baselines as a state at which anthropogenic influences are negligible (unimpacted state) or considered to be negligible (negligible impacts). Whatever option is followed, care should be taken to seek compatibility and synergy with the approaches under the WFD.

Option 1 - Existing unimpacted state/state with negligible impacts

3.3.3 The first is to use information on marine environment from areas where human pressure is considered negligible or non-existent (for example, in some marine protected areas or remote areas). This approach was used as one option to set reference conditions for the Water Framework Directive.

3.3.4 This approach is a highly scientifically robust basis for setting baselines as it demonstrates reference conditions under current geographic and climatic conditions. It is also a relatively transparent and comprehensible approach. However, its robustness depends on the existence of unimpacted areas relevant for the characteristics of the marine environment to be assessed under the MSFD (cf. relevant ecosystem components for operationalisation of GES criteria and indicators), as well as on the quality of available data.

²⁷ This Annex is based on the OSPAR Draft Advice Manual on Biodiversity (Draft 2, version 2 of 31 May 2011). http://circa.europa.eu/Members/irc/env/marine/library?!=informationsfromsotherso/1-documents_conventions/3-ospar_convention&vm=detailed&sb=Title

Option 2 - Historical unimpacted state/state with negligible impacts

3.3.5 The second approach is to use historical information to ascertain what a specific characteristic of the marine environment may have been like at a time when impacts from human activities were negligible. This information can be found in a variety of sources, such as historical accounts, old herbaria, old maps, fishing and whaling records, ships' logs, tax documents and archaeological information, such as fish bone remains.

3.3.6 The History of Marine Animal Populations (HMAP), which is the historical component of the Census of Marine Life (CoML), is a research project focused on this approach. Interpretation of changes in marine populations over the past 500-2,000 years is providing researchers with a baseline that extends back long before the advent of modern technology, or before significant human impact on ecosystems.

3.3.7 This approach provides a moderately scientifically robust basis for setting baselines, depending on the quality and quantity of the available data, as well as expert judgement used in the interpretation of that data. It is a comprehensible approach, but perhaps less transparent than the previous approach based on existing sites. The time involved in applying this approach depends on the degree to which existing research programmes can deliver MSFD data needs. Climatic changes and ecosystem dynamics (e.g. predator-prey relationships) since the period used as a reference point needs to be built into any final definition of this type of baseline.

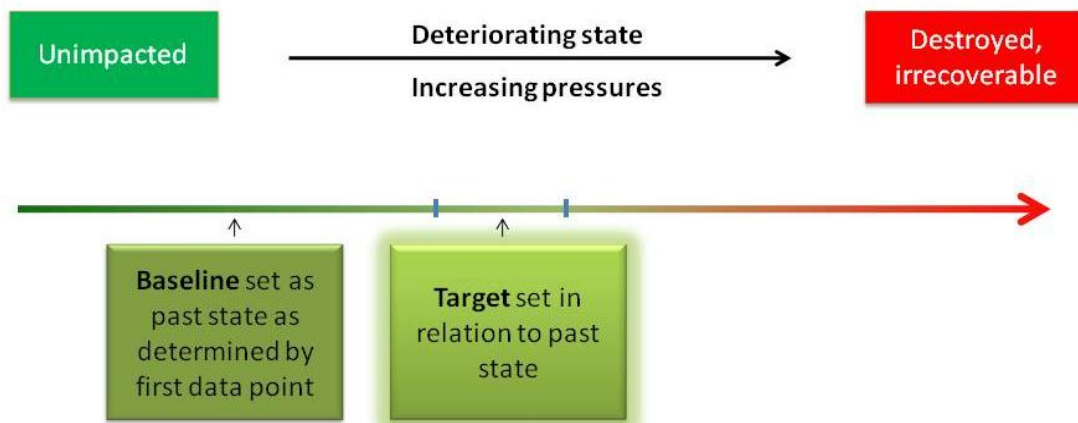
Option 3 - Modelling of unimpacted state/state with negligible impacts

3.3.8 A third approach to setting a baseline is one based on modelling of reference conditions. This approach is closely linked to approach (ii), in that models depend on historic as well as current information to develop a theoretical state of unimpacted ecosystems under present climatic conditions. This type of ecosystem reconstruction modelling work is being developed within academia, such as at British Columbia, Dalhousie and Chicago Universities.

3.3.9 As with approach (ii), the scientific robustness of this option has the potential to be moderate or even high, depending on the nature of the modelling exercise, and crucially on the quality of the data with which it is fed. It offers the possibility of introducing current and future climate scenarios, and their effects on biodiversity state. However, it is perhaps the least transparent or comprehensible of the three

approaches. Another limitation of this approach is that of time. Unless existing programmes are underway that can deliver MSFD needs, new modelling work is not likely to take place within the 2012 timeframe. However, it is an approach that could be considered as part of the future reporting round.

Method B - Baseline set in the past.



3.3.10 The second approach is to set a baseline as a past state, often the date of the first data point in a time series, provided this is considered the least impacted state of the time series. It is important to note that this first data point is not intended to represent unimpacted state, but simply when research or data recording on a particular species population or habitat began.

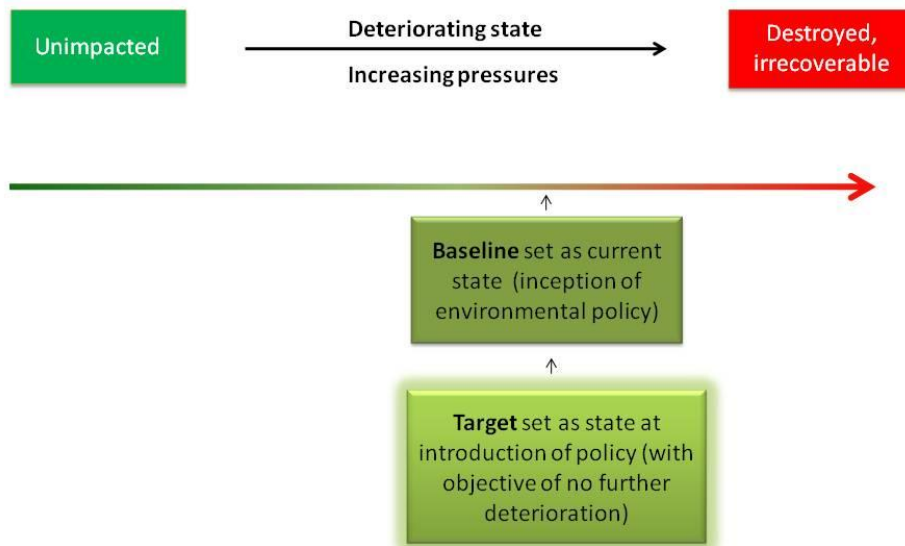
3.3.11 It is a robust approach in the sense that it is based on a time series of scientific data which should indicate how the state of a feature has changed over that specific time; however, it can be limited by the quality and quantity of the data (for example, if the time series is rather short). It can be especially limited if one does not know how strong the impact at the beginning of the time series was. That information is essential to define GES in an adequate manner. The approach is comprehensible, but resultant thresholds/levels/limits run the risk of being based on an already significantly impacted scenario. This is sometimes referred to as the 'shifting baselines syndrome'²⁸, where each generation redefines what they understand to be a 'healthy' marine environment in relation to the past.

3.3.12 Each time series needs expert evaluation to determine whether the first point (or some other point) in the time series is to be selected as the baseline point, taking

²⁸ As described by Pauly, D (1995) "Anecdotes and the shifting baseline syndrome of fisheries." Trends in Ecology and Evolution, 10(10):430.

into account the changes in associated pressures over the time period and other relevant factors.

Method C - Current baseline.



3.3.13 Finally, baselines can be set as the date of inception of a particular environmental policy or the first assessment of state. This approach was used in the context of the Habitats Directive, where the date when the Directive came into force was used by many European countries as the baseline for favourable reference values²⁹. The intention behind this type of baselines is typically to prevent any further deterioration from the current state.

3.3.14 Although this approach is quick, practical and transparent, it is not particularly scientifically robust and provides much less scope for recovery of systems. Such an approach is only appropriate where it is determined that GES has already been achieved and hence only requires “maintenance” under the MSFD. However, it is not appropriate where deterioration or degradation has already occurred as it may not meet the overall aims of the MSFD. Indeed, in that case, there is a risk of succumbing to ‘shifting baseline syndrome’ as described above and it should also be noted that this approach might not be ambitious especially if pressures and impacts are already on a high level.

²⁹ According to Art. 17 of the Habitats Directive guidance on assessment and reporting the favourable reference values in a given biogeographical region are "sufficiently large to allow the long term survival of the habitat/species" and, as a minimum, the ecological state when the Directive came into force. However, the guidance also acknowledges that historical data and expert judgement may also be used to help define these values.

Annex 5 - Co-ordination with Third Countries

In the Black Sea region, using the framework of the Bucharest Convention, and Water agreement between Romania and Bulgaria, third Countries will be invited to join Member States from the region in the implementation of the Directive using pilot projects. A pilot project has been established entitled "Support to the Black Sea Commission for the Implementation of the Marine Strategy³⁰", the aim of which focuses on achieving GES and addressing key environmental issues in the Black Sea marine region.

For the North-East Atlantic, the OSPAR Commission's role as facilitator for the regional coordination of the implementation of the MSFD has been emphasised by OSPAR Ministers at their meeting in September 2010 and is set out in the 2010 Ministerial Declaration, the 2010 North-East Atlantic Environmental Strategy and the Joint Assessment and Monitoring Programme for 2010-2014 (which is directed to the establishment of monitoring programmes in support of the MSFD).³¹ This has led to the restructuring of the OSPAR Commission, resulting in the establishment of a coordination process through the Coordination Group (CoG) and an Intersessional Correspondence Group for the Marine Strategy Framework Directive (ICG-MSFD). It is through this group that EU Member States and Third Countries (in particular Norway and Iceland) work together on the implementation of the MSFD. All relevant OSPAR groups contribute to the coordination process in their fields of expertise.

In the Baltic Sea, the HELCOM Ministerial Meeting in 2010³² decided to further develop the role of HELCOM as the main driving force of the implementation of the ecosystem approach to the management of human activities in the Baltic Sea marine area. This included taking into account the role of other organisations, and establishing, for those HELCOM Contracting States being also EU-Member States, the role of HELCOM as the coordinating platform for the regional implementation of the EU Marine Strategy Framework Directive (EU MSFD) in the Baltic Sea. This should lead to harmonised national marine strategies for achieving good environmental status according to the HELCOM Baltic Sea Action Plan and the EU MSFD with full cooperation of the HELCOM Contracting Parties.

³⁰ Grant Agreement No. 21.0401/2008/517948/SUB/D2

³¹ OSPAR Ministerial Declaration and North-East Atlantic Environment Strategy:
[http://www.ospar.org/content/content.asp?menu=014410000000_000000_000000](http://www.ospar.org/content/content.asp?menu=0144100000000_000000_000000)

³² HELCOM Ministerial Declaration on the implementation of the HELCOM Baltic Sea Action Plan, 2010 (<http://www.helcom.fi/stc/files/Moscow2010/HELCOM%20Moscow%20Ministerial%20Declaration%20FINAL.pdf>)

In the Mediterranean, the Contracting Parties to the Barcelona Convention at their 15th meeting held in 2008, Almeria, Spain, decided that UNEP/MAP should gradually apply an ecosystem approach for the management of human activities in the Mediterranean. The intention is to achieve the ecological vision for the Mediterranean corresponding to “a healthy Mediterranean with marine and coastal ecosystems that are productive and biologically diverse for the benefit of present and future generations’ (Decision IG 17/6)17. In 2009, the Contracting Parties to the Barcelona Convention further decided that the Ecosystem Approach is the overarching principle of MAP’s 5 year strategy. Work to implement Decision IG 17/6 has since been guided by the Government designated expert (GDE) group and supported by the meetings of the technical expert group with participation of all Mediterranean countries (EU and non-EU). The forthcoming Contracting Parties’ meeting is expected to adopt an initial integrated regional report identifying important ecosystem properties and an assessment of ecological status and pressures; a set of ecological objectives corresponding to the vision and strategic goals; operational objectives with relative indicators; and a timeline which ensures coherence between MAP ECAP process and addressing issues raised by the MSFD in the Regional Sea. The implementation of the ECAP by all Mediterranean countries will assist Mediterranean EU Member States in the implementation of the MSFD, by providing a platform for harmonisation of national marine strategies of all countries on a regional scale.

Annex 6 Towards a common assessment philosophy

- 4.4.1 The following text was drafted during the discussions on initial assessment, determination of GES and establishment of environmental targets. It is reproduced here as useful thoughts for further reflection at EU level on assessment philosophy.
- 4.4.2 When considering the assessment of environmental status it is useful to highlight the distinction between those Descriptors pertaining to state and those which address specific pressures.
- 4.4.3 In making this distinction it can be considered entirely appropriate that Descriptors 1 (Biodiversity), 3 (Commercial fish stocks), 4 (Food webs) and 6 (Seafloor integrity) could, given their relationship to ecological state, be grouped together in order to express the overall condition or health of the marine environment, which includes ecosystem functioning. This, in effect, could be taken to mean that the overall achievement of GES would not be possible if any of the criteria for the four 'state' Descriptors (1, 3, 4, 6) failed to meet the agreed characteristics of GES.
- 4.4.4 This approach is not, however, appropriate for the remaining pressure-related Descriptors (D 2 (Non-indigenous species), 5 (Eutrophication), 7 (Hydrographical conditions), 8 (Contaminants), 9 (Contaminants in seafood), 10 (Marine litter) and 11 Energy); possibly 3 (Commercial fish stocks) as far as pressures aspects are concerned given the often complex relationship between pressure, state and impact. For example, it may be possible for an assessment of a pressure to indicate a failure to achieve the descriptor-related GES, despite Descriptors 1, 3, 4 and 6 still meeting the desired overall environmental state, which, it can be argued, is the overall goal of the Directive. This can be further illustrated by considering Descriptor 5 (eutrophication). It may be considered that GES is achieved for this Descriptor when there are no remaining 'problem areas' in a Member State's waters, however failure to achieve this may not necessarily result in a failure to achieve or maintain GES for Descriptors 1, 3, 4 and 6 which may still be assessed against their indicators and criteria as meeting GES.

One assessment of GES?

- 4.4.5 According to the definitions in Art. 3 (4) and (5) MSFD on 'environmental status' and 'Good Environmental Status' and Art. 8 MSFD (assessment - 8.1.a), Member

States should address the overall state of their marine waters in their assessments, across all relevant descriptors, criteria and indicators.

- 4.4.6 Practically, GES will be first assessed at the level of Descriptors according to the criteria and indicators laid down in the EU COM Decision 2010/477/EU as far as these are developed. A degree of weighting and expert judgement will then need to be applied in order to come to an overall conclusion as to whether GES is being achieved first at the level of criterion and then at that of the Descriptor. From the Directives it is not clear whether it does require Member States to go further than this by providing an overall assessment of whether GES is being achieved in national waters. One could argue that the natural system does not follow the segregation into descriptors and that they need to be considered as a whole system, so that the overall assessment might imply more than simply aggregating results of GES assessments for each descriptor. For this, methodologies still need to be developed.
- 4.4.7 Anyhow, in order to provide a complete picture Member States could consider aggregating the individual assessments at Descriptor level into an overall consideration as to whether GES is broadly being achieved. It is at this point where the considerations made in the previous section as to overall GES being achieved if D1, 3, 4, and 6 are meeting GES can be put into practice.
- 4.4.8 Expanding further on this point, for a truly integrated assessment of the environmental state, the criteria and indicator assessments under the eleven descriptors could be aggregated. In particular Descriptors 1, 3, 4 and 6 could be aggregated to express the condition or health of the marine environment. It can be considered appropriate to apply the principle that the worst result for any of the criteria under one of these three descriptors will reflect your overall assessment as to whether GES is being achieved or not i.e. if one fails they all fail and GES cannot be achieved. Applying this principle to many of the other Descriptors seems inappropriate however, given the high number of single and unrelated “internal” assessment results for descriptors, including the possibility that at least one of the indicator or criteria assessments could remain at “Non-GES” level for a long period or forever despite it not affecting GES for D1, 3, 4, and 6. Application of the principle might also be difficult because species might disappear or shift in their distributional range due to natural phenomena, or to reasons hard to establish, and this does not imply that GES is not reached. The principle could be applied within certain pressure-based descriptors such as D5 (eutrophication) and D8 and D9 (contaminants).

4.4.9 This process of providing an overall assessment of GES based on the aggregation or grouping of analyses made at different levels i.e. at the level of indicators, criteria and Descriptors is illustrated in *Figure 1*.

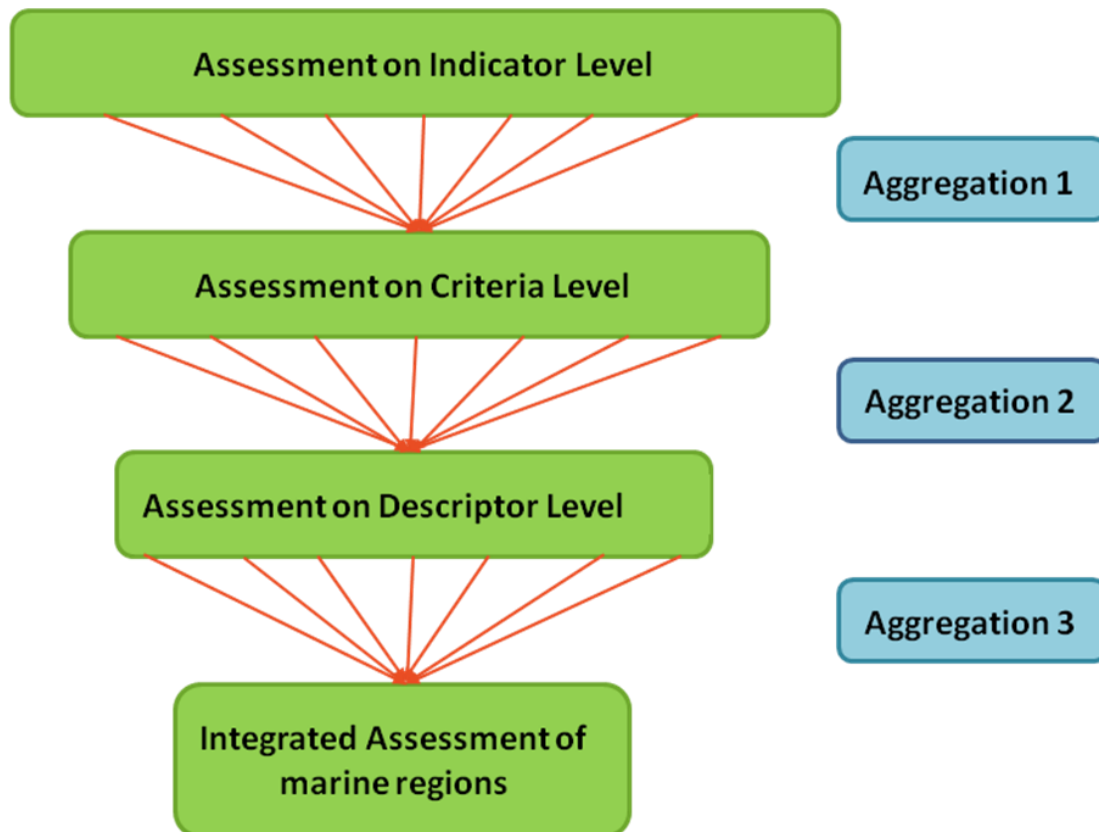


Figure 1: Possible aggregation levels for the integrated assessment of marine regions

4.4.10 Generally, it should be noted that such overall assessment does not stand alone. It illustrates the status of the marine environment from the ecological perspective. It has to be complemented by specific assessments of the relevant descriptors addressing human activities or impacts on the marine environment (e.g. D 2 non-indigenous species, D 3 commercial stocks of fish and shellfish, D 5 eutrophication, D 8 and 9 contaminants, D 10 marine litter and D 11 energy including noise) (Fig. 4). Those “single” assessments build the basis for the development of environmental targets in order to guide progress towards achieving GES in the marine environment. Based on these targets, programmes of measures have to be formulated. In consequence the pressure and impact related descriptors act as adjusting screws to move towards GES

4.4.11 At this stage it is possible conceptually to group the eleven descriptors into two clusters (state and pressure). Within the state-based cluster (D1, 3, 4, & 6),

aggregation could take place at a Descriptor level which would help identify obvious redundancies and overlaps and strengthen links across the criteria and indicators. Under the pressure-based cluster, aggregation at the highest level may not be practical for the reasons previously referred to; however it may be possible in some cases at the level of criteria and indicators within one descriptor. At this point in time this remains a conceptual outline requiring further development if it is to assist future assessments.

4.4.12 HELCOM has developed assessment tools (HELCOM HEAT, BEAT CHASE and HOLAS, cf.

http://www.helcom.fi/publications/bsep/en_GB/bseplist/http://www.helcom.fi/publications/bsep/en_GB/bseplist³³) which allow aggregation of indicators at various levels as well as weighting of single indicators. This is an approach which might give potential for pan-European assessment tools.

Categories of Assessment Status - Good & Bad.

4.4.13 The MSFD categorises/classes the status of a marine area into either 'good' or 'bad' environmental status (GES is achieved or not achieved). In this sense, the MSFD is not particularly flexible in comparison with other related EU obligations such as the WFD and the Habitats Directive. The WFD comprises of two different assessment categories (ecological status & chemical status) each subdivided further into different classes. Ecological status is divided into five classes, whilst chemical status is divided into two. The Habitats Directive has four classes including one which addresses unknown status.

4.4.14 The adoption of only two assessment categories/classes results in a very black and white picture, making it hard to articulate whether progress is actually being made towards achieving GES or not.

4.4.15 There is also the potential that under the second assessment in 2018 a better understanding might result in more areas being identified as failing or meeting

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HELCOM 2006: Development of tools for assessment of eutrophication in the Baltic Sea (BSEP 104) (available only on website)

HELCOM 2009: Eutrophication in the Baltic Sea – An integrated thematic assessment of the effects of nutrient enrichment in the Baltic Sea region (BSEP 115B)

HELCOM 2009: Biodiversity in the Baltic Sea - An integrated thematic assessment on biodiversity and nature conservation in the Baltic Sea (BSEP 116B)

HELCOM 2010: Hazardous substances in the Baltic Sea - An integrated thematic assessment of hazardous substances in the Baltic Sea (BSEP 120B)

HELCOM 2010: Towards a tool for quantifying anthropogenic pressures and potential impacts on the Baltic Sea marine environment: A background document on the method, data and testing of the Baltic Sea Pressure and Impact Indices (BSEP 125) (available only on website)

HELCOM 2006: Development of tools for assessment of eutrophication in the Baltic Sea (BSEP 104) (available only on website)

GES thus indicating, potentially incorrectly, that pressures are increasing and leading to a decrease in status or conversely management measures are having a positive effect on status.

4.4.16 For several marine areas it is also imaginable that there could be a significant improvement in status yet GES would still not be reached. This positive movement towards achieving GES would not be reflected under the current 2 category/category approach. A greater resolution would be afforded by the addition of assessment categories/classes thus providing greater transparency in illustrating our progress towards achieving GES. Such transparency will be crucial in conveying a positive and accurate picture to the public, politicians and environmental managers. Furthermore, such an improvement in resolution would help align the MSFD assessment categories with existing regulations such as the WFD and Habitats Directive.

4.4.16 With this in mind, different options could be considered, to show progress towards GES and to align with the classification results under the Water Framework Directive. Further discussion on this is needed. Options could include to stick to 2 assessment classes and use trends to indicate progress. Other options could include an increase in assessment categories/classes or the use of ranges. One could consider 5 classes (ecological status) and 2 classes (chemical status) for coastal waters and 2 classes for marine water. Another approach could be to apply 5 categories to both state and pressure elements such as: GES achieved/maintained, status improving/pressure decreasing, no change: status decreasing/pressure increasing, unknown

4.4.17 If a multi-class approach was to be adopted it is likely the EU Commission would continue to require reporting by two classes. However, this would be easily achieved since all the categories/classes not equalling GES could be aggregated into one. Consideration may be given to the need to further subdivide category/class i) GES achieved/maintained i.e. to indicate if status continues to improve, is stable, or is decreasing.

4.4.18 In conclusion, Member States should attempt to at least provide an indication of the direction in trends in their national assessments and consider whether it would be possible to adopt the aforementioned categories in order to assist with regional coordination.