

ARTICLE

Changing the Base: Legal Implications of Scientific Criteria and Methodological Standards on what Constitutes Good Marine Environmental Status

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Abstract

The Decision on Criteria and Methodological Standards on Good Environmental Status of Marine Waters provides the conceptual framework for the assessment and valuation of the marine waters of EU Member States. In particular, it provides concepts for defining what constitutes good marine environmental status – a status which Member States are obligated to achieve by the year 2020 under the 2008 Marine Strategy Framework Directive. This article aims to elucidate the epistemic and normative dimensions of scientific criteria and methodological standards, as well as their importance in the legal treatment of the marine environment of the EU. The article also assesses how and to what extent the transnational process leading up to the Decision was structured, surveying existing ideas and perspectives as to what exactly constitutes good environmental status, and examining whether the structure of the Decision ensures that those affected by it would want to accept it.

Keywords: Good Marine Environmental Status, European Union, Marine Strategy Framework Directive, Scientific Criteria and Methodological Standards, Commission Decision 477/2010/EU, Theory-Dependence of Observations

1. INTRODUCTION: GOOD ENVIRONMENTAL STATUS AND THE ‘THEORY-DEPENDENCE OF OBSERVATIONS’

On 17 June 2008, the European Parliament and Council adopted the Marine Strategy Framework Directive (MSFD).¹ Its main goal was to establish a framework within

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¹ Directive 2008/56/EC establishing a Framework for Community Action in the Field of Marine Environmental Policy (Marine Strategy Framework Directive) (MSFD) [2008] OJ L114/19.

which the ‘Member States shall take the necessary measures to achieve or maintain *good environmental status* in the marine environment by the year 2020 at the latest’.² However, despite an extensive definition provided by the MSFD, the content of ‘good environmental status’ (GES) remains general and vague. To some extent this may be ascribed to the fact that the European Union (EU) legislator had to adopt the MSFD in a situation where huge knowledge gaps existed (and still exist) with regard to the effects of anthropogenic pressures on the functioning of marine systems. However, without a complete understanding of the functioning of marine systems, deciding what could constitute GES in marine environments is a difficult task.³ To guide and support Member States throughout the process of defining and achieving GES, in September 2010 the Commission adopted a Decision on Criteria and Methodological Standards on Good Environmental Status of Marine Waters (Commission Decision).⁴ This addresses, *inter alia*, the criteria and methodological standards to be used by the Member States in making an initial assessment of the marine environment, defining GES, and developing environmental targets and programmes of measures to achieve or maintain GES.⁵

Prima facie, the Commission’s establishment of scientific criteria and methodological standards closely resembles ‘regulatory standard setting’.⁶ However, the Decision’s goal is explicitly not to impose a specific idea or boundary of what can be considered GES in marine waters but instead to provide guidance on how to examine and quantify marine ecosystems – that is, to provide Member States with viable concepts of how to assess and value their marine waters.

It is a truism in science that observations, assessments and valuations, to a large extent, depend on the observer’s prior knowledge, concepts, interests and expectations (in the philosophy of science this is termed ‘theory-dependence of observations’).⁷ These, in turn, are influenced by their cultural backgrounds, value systems, scientific

² *Ibid.*, Art. 1(1) (emphasis added).

³ European Commission, Communication from the Commission to the Council and the European Parliament: Thematic Strategy on the Protection and Conservation of the Marine Environment, COM(2005)504 final, 24 Oct. 2005, at p. 4; European Commission, Communication from the Commission to the Council: Fishing Opportunities for 2008 – Policy Statement from the European Commission, COM(2007)295 final, 6 June 2007, at p. 5.

⁴ European Commission Decision 477/2010/EU on Criteria and Methodological Standards on Good Environmental Status of Marine Waters [2010] OJ L232/14.

⁵ *Ibid.*; see also Arts. 5, 8, 9, 10 and 13 MSFD.

⁶ See, on this topic, the works of S. Jasanoff, *The Fifth Branch: Science Advisers as Policymakers* (Harvard University Press, 1990); S. Jasanoff, ‘Science and Judgment in Environmental Standard Setting’ (1998) 11(1) *Applied Measurement in Education*, pp. 107–20; G. Majone, ‘Science and Trans-Science in Standard Setting’ (1994) 9(1) *Science, Technology & Human Values*, pp. 15–22; K.-H. Ladeur, *Das Umweltrecht der Wissenschaftsgesellschaft* (Duncker & Humboldt, 1995); see also contributions in G. Winter (ed.), *Grenzwerte – Interdisziplinäre Untersuchungen zu einer Rechtsfigur des Umwelt-, Arbeits-, und Lebensmittelschutzes* (Werner Verlag, 1986).

⁷ See N.R. Hanson, *Patterns of Discovery* (Cambridge University Press, 1958); Chapter 1, at pp. 4–30; see also T. Kuhn, *The Structure of Scientific Revolutions* (Chicago University Press, 1970), at pp. 123–47. The most prominent radical and relativistic interpretation of ‘theory-dependence of observations’ is obviously given by P.K. Feyerabend, *Against Method* (New Left Books, 1975).

traditions and basic philosophical assumptions.⁸ What and how observers perceive and value is, to a large degree, determined by the conceptual frame from which they judge. Accordingly, the observations and valuations of scientists, as well as policy- and lawmakers, with regard to marine ecosystems are largely shaped by their pre-existing ideas about the environment.⁹ The Commission Decision explicitly states that its

criteria for the achievement of the good environmental status are the starting point for the development of coherent approaches in the preparatory stages of marine strategies, including the determination of good environmental status and the establishment of a comprehensive set of environmental targets, to be developed in a coherent and coordinated manner [...].¹⁰

Thus, the Commission Decision will, on a very basic level, contribute to the development, shaping and alignment of the future common conceptual frame from which scientists, as well as policy- and lawmakers of the EU and Member States, will assess and value ecosystems. Because the Commission Decision does not merely *implement* but *alters* values with respect to the marine environment, it has enormous social and political consequences.¹¹ In fact, any future marine environmental legislation adopted by the EU or Member States under the MSFD and other regimes will, to some extent, also have to reflect the Commission Decision.¹²

It is argued here that since the concepts used to quantify and assess the marine environment constitute the foundation for our observations, assessments and evaluations, their exact content and scope, as well as their impact on other environmental legislation, should be subject to critical scrutiny. This argument is supported by the fact that scientific criteria and methodological standards often reflect only the (very) limited and temporary state of knowledge in rapidly developing areas of scientific research.¹³ It is also supported by the fact that choosing and framing scientific

⁸ As Foucault put it, '[t]he subject of knowledge itself has a history: the relation of the subject to the object; or more clearly, truth itself has a history': M. Foucault, 'Truth and Juridical Forms', in J.D. Faubion (ed.), *Power: Essential Works of Foucault, 1954–1984: Vol. 3* (The New Press, 2000), pp. 1–89, at 1–2. See also N. Luhmann, 'Closure and Openness: On Reality in the World of Law', in G. Teubner (ed.), *Autopoietic Law: A New Approach to Law and Society* (Walter de Gruyter, 1988), pp. 335–48.

⁹ See more specifically D. Demeritt, 'What is the "Social Construction of Nature"? A Typology and Sympathetic Critique' (2002) 26 *Progress in Human Geography*, pp. 767–90; N. Castree, 'Socializing Nature: Theory, Practice, and Politics', in N. Castree & B. Braun (eds.), *Social Nature: Theory, Practice, and Politics* (Blackwell, 2001), at pp. 1–21; N. Castree & B. Braun, 'The Construction of Nature and the Nature of Construction', in B. Braun & N. Castree (eds.), *Remaking Reality: Nature at the Millennium* (Routledge, 1998), pp. 3–42.

¹⁰ Recital 1, Commission Decision, n. 4 above.

¹¹ Tribe noted that all social choices 'alter, and not merely implement, the values of the societies in which such choices are made': see L.T. Tribe, 'Technology Assessment and the Fourth Discontinuity: The Limits of Instrumental Rationality' (1973) 46 *Southern California Law Review*, pp. 616–60, at 634 and 640.

¹² Arguing in this direction, L.D. Mee et al., 'How Good Is Good? Human Values and Europe's Proposed Marine Strategy Directive' (2008) 56(2) *Marine Pollution Bulletin*, pp. 187–204; on the epistemic dimension of standard setting, see Majone, n. 6 above, pp. 15–22; K. Jax, *Die Einheiten der Ökologie: Analyse, Methodenentwicklung und Anwendung in Ökologie und Naturschutz* (Peter Lang, 2002).

¹³ See generally on the temporary nature of scientific knowledge K. Popper, *Logik der Forschung* (Akademie-Verlag, 2010).

criteria and methodological standards may, to a substantial extent, include value judgments.¹⁴ Accordingly, Sections 2 and 3 of this article will assess the content, limits and normative aspects of three selected criteria and methodological standards included in the Commission Decision. The potential future role and relevance of the scientific criteria and methodological standards of the Decision for other EU marine legislation and policies will be discussed in Section 4. Implementation challenges will be addressed, and the mandatory force of the requirements laid down in the MSFD to achieve good marine environmental status (as quantified and assessed by the scientific criteria and methodological standards) will be analyzed.

Finally, given the Commission Decision's important role with regard to the current and future legal treatment of EU marine waters under EU law, Section 5 will ask why such a fundamental decision should be considered valid and effective, and why those affected by it would want to accept it. This is important, because it seems questionable whether the Commission Decision sufficiently reflects and acknowledges the many different ideas and perspectives that exist regarding what exactly GES might be. That such an important decision was developed and adopted by only a small group of scientific experts and bureaucrats calls for justification. Accordingly, this submission will assess how and to what extent the process leading up to the adoption of the scientific criteria and methodological standards was structured, to what extent the Commission Decision acknowledges the many different ideas and perspectives as to what exactly GES might be and, finally, whether or not this structure ensures that those affected by the Decision would want to accept it.¹⁵

2. THE LEGISLATIVE FRAMEWORK

To this day, the EU has not developed a comprehensive marine policy. Measures relating to the marine environment have primarily been adopted piecemeal under varying institutional settings (different legal bases, different competences and different actors).¹⁶ The underdeveloped marine policy has been attributed to, inter alia:¹⁷

- a lack of understanding of marine ecosystems;
- the interdepartmental and interjurisdictional nature of marine issues;
- the conflicting interests of Member States regarding ocean policies;

¹⁴ P. Kitcher, *Science, Truth & Democracy* (Oxford University Press, 2002), at pp. 43–55; for similarities in the area of environmental standard setting, see Jasanoff, n. 6 above.

¹⁵ Arguing in favour of a strong involvement of the public in relation to the conversion of science to policy under the MSFD, see S. Fletcher, 'Converting Science to Policy through Stakeholder Involvement: An Analysis of the European Marine Strategy Directive' (2007) 54(12) *Marine Pollution Bulletin*, pp. 1881–6.

¹⁶ See, e.g., European Commission, Communication from the Commission to the Council and the European Parliament – Towards a Strategy to Protect and Conserve the Marine Environment, COM(2002)539 final, 2 Oct. 2002, at pp. 9–13.

¹⁷ See, e.g., V. Frank, *The European Community and Marine Environmental Protection in the International Law of the Sea* (Brill, 2007), at pp. 79–85; L. Krämer, *EC Environmental Law* (Sweet & Maxwell, 2007), at p. 299.

- the fragmentation of institutions at the EU level; and
- the fact that the EU traditionally relied on existing international regimes such as OSPAR¹⁸ and HELCOM.¹⁹

Since 2002, however, the EU has taken several actions towards a more coherent and integrated ocean policy. This includes the expansion of the institutional mandate of the Directorate-General for Maritime Affairs and Fisheries (DG Fisheries; since 2005 also known in short as DG Mare), the development of a comprehensive action programme entitled Integrated Maritime Policy (IMP),²⁰ and particularly the adoption of the MSFD.²¹ The MSFD is now the central legal instrument that integrates and develops existing marine environmental protection law and is widely referred to as the ‘environmental pillar of the EU’s Integrated Marine Policy’.²²

2.1. *The EU’s Maritime Strategy Framework Directive*

The MSFD, adopted in 2008, establishes a legal framework within which ‘Member States shall take the necessary measures to achieve or maintain good environmental status in the marine environment by the year 2020 at the latest’.²³ The MSFD neither provides an extensive codification of existing marine protection regulations, nor does it instantaneously modify any existing laws or impose any comprehensive obligations on the Member States.²⁴ Its regulatory scope remains restricted, and it can be understood as a supplementary legal framework within which existing and future conservation measures of the EU and Member States are to be developed and enhanced.²⁵ The EU’s role in this process is basically limited to promoting and guiding the strategic development that takes place at the national level by providing a temporal, procedural and substantive framework.²⁶

¹⁸ Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR), Paris (France), 22 Sept. 1992, in force 25 Mar. 1998, available at: <http://www.ospar.org>.

¹⁹ Convention on the Protection of the Marine Environment of the Baltic Sea Area (HELCOM), Helsinki (Finland), 9 Apr. 1992, in force 17 Jan. 2000, available at: http://www.helcom.fi/Convention/en_GB/convention.

²⁰ See European Commission, Communication on an Integrated Maritime Policy for the European Union, COM(2007)575 final, 10 Oct. 2007.

²¹ N. 1 above.

²² Recital 3, MSFD, *ibid.*; see also T. Markus, S. Schlacke & N. Maier, ‘Legal Implementation of Integrated Ocean Policies: The EU’s Marine Strategy Framework Directive’ (2011) 26 *The International Journal for Marine and Coastal Law*, pp. 59–90; L. Juda, ‘The European Union and the Marine Strategy Framework Directive: Continuing the Development of European Ocean Use Management’ (2010) 41(1) *Ocean Development & International Law*, pp. 34–54, at 44.

²³ Art. 1(1) MSFD.

²⁴ See particularly restrictions in Arts. 13(5), 14(1)–(4) and 15(1)–(2) MSFD.

²⁵ Markus et al., n. 22 above; L. Juda, ‘The European Union and Ocean Use Management: The Marine Strategy and the Maritime Policy’ (2007) 38(3) *Ocean Development & International Law*, pp. 259–82; R. Barnes & D. Metcalfe, ‘Current Legal Developments: The European Union’ (2010) 25(1) *The International Journal of Marine and Coastal Law*, pp. 81–91, at 82.

²⁶ In that sense it resembles, to a large extent, the EU’s Water Framework Directive (WFD) (Directive 2000/60/EC establishing a Framework for Community Action in the Field of Water Policy [2000] OJ L327/1), which has been characterized by Maria Lee as follows: ‘Rather than clear and obviously binding directions, the [WFD] is dominated by tools to influence the mind of the decision-makers.’ According to Lee, ‘[t]here is a distinct emphasis in the [WFD] on mechanisms that encourage institutions to learn, to revisit decisions, and to generate and absorb new information’: see M. Lee, ‘Law and Governance of Water Protection Policy’, in J. Scott (ed.), *Environmental Protection: European Law and Governance* (Oxford University Press, 2009), pp. 27–55, at 36.

The MSFD requires Member States to take six procedural steps according to a ‘plan of action’:²⁷

- initial assessment of the current environmental status, in accordance with Article 8 of the MSFD (by 15 July 2012);
- determination of GES, in accordance with Article 9 of the MSFD (by 15 July 2012);
- establishment of a series of environmental targets and associated indicators, in accordance with Article 10(1) of the MSFD (by 15 July 2012);
- establishment and implementation of a monitoring programme for ongoing assessment and regular updating of targets, in accordance with Article 11(1) of the MSFD (by 15 July 2014);
- development of a programme of measures designed to achieve or maintain GES, in accordance with Article 13(1) to (3) of the MSFD (by 2015); and
- entry into operation of the programme, in accordance with Article 13(10) of the MSFD (by 2016).

Member States are currently at the preparatory stage – drawing up initial assessments, determining GES, establishing targets and monitoring programmes. However, in order to achieve a sufficient and congruent understanding of the status of the marine environment, the pressures to which it is exposed, the state of existing regulation and, finally, the relevant interests and policy objectives within the different sectors, Member States must develop common assessment criteria – that is, a ‘shared conceptual frame’. To guide this process, the MSFD entails a complex definition of GES and a set of descriptors and indicators, which will now be described in more detail.

2.2. *The MSFD’s Key Concept: Good Environmental Status*

The MSFD’s key concept is to achieve GES by 2020. Article 3(5) of the MSFD puts forward a highly ambitious definition of GES:

[T]he environmental status of marine waters where these provide ecologically diverse and dynamic oceans and seas which are clean, healthy and productive within their intrinsic conditions, and the use of the marine environment is at a level that is sustainable, thus safeguarding the potential for uses and activities by current and future generations.

This definition is complemented by additional criteria that require, for example, that ecosystems ‘function fully’ and that anthropogenic inputs ‘do not cause pollution effects’.²⁸ The MSFD provides further guidance on this issue by requiring Member States to apply an ecosystem approach.²⁹ According to Article 1(3) of the MSFD, the purpose of the ecosystem approach is to

²⁷ Art. 5(2) MSFD.

²⁸ *Ibid.*, Art. 3(5)(a–b).

²⁹ *Ibid.*, Art. 3(5)(2).

ensur[e] that the collective pressure of such activities is kept within levels compatible with the achievement of good environmental status and that the capacity of marine ecosystems to respond to human-induced changes is not compromised, while enabling the sustainable use of marine goods and services by present and future generations.

Ultimately, however, the content of the words ‘good environmental status’ will be determined by the Member States themselves based on the descriptors set out in Annex I, which is titled ‘Qualitative descriptors for determining good environmental status’.³⁰ To ensure a coherent, consistent and comparable process, the criteria and methodological standards for determining GES are to be harmonized by the Commission in accordance with EU comitology procedures (the regulatory procedure with scrutiny).³¹

2.3. Three MSFD Descriptors and the Commission Decision on Criteria and Methodological Standards

The Decision on Criteria and Methodological Standards on Good Environmental Status of Marine Waters³² specifies the criteria and methodological standards for assessing the extent to which GES is achieved in relation to each descriptor listed in Annex I of the MSFD. Explanations and definitions are based on standards that have been available under existing EU legislation or provided through assessments of ‘task groups’ set up and led by the International Council for the Exploration of the Seas (ICES) and the Joint Research Centre (JRC), as well as from consultations with regional seas conventions.³³ While the Commission Decision defines some criteria extensively, others require further refinement. The Commission notes that there is a ‘substantial need to develop additional scientific understanding for assessing good environmental status’.³⁴ It also states that a revision of the Decision should be carried out ‘as soon as possible’ after the completion of the Commission’s assessment of the Member States’ notifications under Articles 9(2), 10(2) and 11(3) of the MSFD – that is, during the initial assessment, the determination of GES, their environmental

³⁰ *Ibid.*, Art. 9(1). Compare the similar approach under the EU Water Framework Directive (WFD), n. 26 above. Regarding implementation of environmental objectives under the WFD, see Lee, n. 26 above, at pp. 30 and 48–50.

³¹ Arts. 9(3) and 25(3) MSFD. As the MSFD was adopted prior to the entry into effect of the Lisbon Treaty, its provisions on delegation and implementation are governed by the amended Comitology Decision of 2006, and not by Arts. 290 and 291 of the Treaty on the Functioning of the European Union (TFEU) (Lisbon (Portugal), 13 Dec. 2007, in force 1 Dec. 2009, available at: <http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2010:083:0047:0200:en:PDF>). See Decision 1999/468/EC laying down the Procedures for the Exercise of Implementing Powers Conferred on the Commission [1999] OJ L184/23, as amended by Decision 2006/512/EC [2006] OJ L200/11.

³² N. 4 above.

³³ See Recitals 2 and 5, Commission Decision, n. 4 above; the Directorate-General for Health and Consumers (DG Sanco) was responsible for Descriptor 9 – Contaminants in Fish and Seafood for Human Consumption.

³⁴ Recital 3, Commission Decision, *ibid.*

targets and their envisaged monitoring programmes.³⁵ Three of these very distinct descriptors will now be described and analyzed in greater detail.³⁶

Biodiversity

Descriptor 1 of Annex I of the MSFD requires that '[b]iological diversity is maintained. The quality and occurrence of habitats and the distribution and abundance of species are in line with prevailing physiographic, geographic and climatic conditions'. In addition, the Commission Decision states that an 'assessment is required at several ecological levels' – at the levels of species, habitats and ecosystems. The species assessment should consider species distribution (range, pattern and area covered), population size (abundance or biomass) and population condition (demographic characteristics or genetic structure). The habitat assessment should take into account habitat distribution (range and pattern), its extent (area, and volume where relevant), and condition (typical species and communities, relative abundance or biomass as appropriate, and physical, hydrological and chemical conditions). The ecosystem analysis includes an assessment of the ecosystem structure (the composition and relative proportion of ecosystem components for both habitats and species).

Fisheries

Descriptor 3 of Annex I of the MSFD requires that '[p]opulations of all commercially exploited fish and shellfish are within safe biological limits, exhibiting a population age and size distribution that is indicative of a healthy stock'. The Commission Decision specifies and refers to three important indicators of the health of the population: fishing pressure, reproduction capacity of fish stocks, and population age and size distribution. Fishing pressure is to be determined by two additional indicators: fishing mortality and catch/biomass ratio. Fishing mortality is defined in the Draft Decision, which states that 'achieving good environmental status requires that F values [(mortality rate)] are equal or lower than F-MSY, the level capable of producing Maximum Sustainable Yield' – and there is an even lower mortality rate proposed for mixed fisheries. Where information on fishing mortality rates is not available, the catch/biomass ratio which yields MSY can be taken as a secondary indicative reference. 'The value for the indicator that reflects F-MSY needs to be determined by scientific judgment [. . .]'. Alternatively, Member States may develop secondary indicators on the basis of any other appropriate proxy for fishing mortality. While the primary indicator for the reproductive capacity is the spawning stock biomass 'that would achieve MSY under a fishing mortality equal to F-MSY', the secondary indicator (the 'biomass index') requires a 'high probability that the [respective] stock will be able to replenish itself under the existing exploitation conditions'.

³⁵ *Ibid.*, Recital 4.

³⁶ These three specific descriptors were chosen because (a) they are particularly suitable for illustrating different qualities of scientific criteria and methodological standards, and (b) the author had access to scientific data as well as legal and political background information regarding their creation.

The final criterion of reference to ‘population age and size distribution’ as an indicator is built on the idea that ‘healthy stocks’ are characterized by the high survival of old, large individuals. This takes into account the proportion of large fish, the mean maximum length, the 95th percentile of the fish length distribution observed in research vessel surveys, and the size at first sexual maturity.

Energy entrances (including underwater noise)

Descriptor 11 of Annex I of the MSFD is concerned with the introduction of energy, which includes underwater noise. It requires the introduction to be at levels ‘that do not adversely affect the marine environment’. The Commission explains that additional scientific and technical progress is required to support the development of the criteria related to this descriptor in order to better determine the impact on marine life. At present, the ‘main orientations for the measurement of underwater noise have been identified as a first priority in relation to assessment and monitoring’.³⁷ At the current stage, the aspects of underwater sounds that should be measured according to the Commission Decision are:

- (a) the distribution in time and place of loud, low and mid frequency impulsive sounds; and
- (b) continuous low frequency sounds.

3. EPISTEMIC AND NORMATIVE EVALUATION OF CRITERIA AND METHODOLOGICAL STANDARDS

The three criteria and methodological standards serve as examples of how the general epistemic aspects and properties of scientific criteria and methodological standards unfold in environmental law. They will be used to illustrate how criteria and standards condition our understanding and modes of thought as well as our knowledge about the environment and, eventually, our approach to environmental law.³⁸ First, they provide concepts for how to assess, quantify and value the marine environment; however, by focusing our perception on specific aspects of certain phenomena in nature, they also restrict our understanding and realization of other aspects of nature. Secondly, although scientific criteria and standards are used to describe ‘what is (in) the marine environment’, their content is also normative because they are based on political value judgments and because they inform the law by defining what is and what is not to be regarded as ‘good’ marine environment status. Thirdly, criteria and methodological standards only provide options for how to assess, quantify, and eventually define the marine environment; they do not ultimately set the boundaries of what GES is. This raises the

³⁷ See text to Descriptor 11, Part B, Commission Decision, n. 4 above.

³⁸ See J. Dancy, *Introduction to Contemporary Epistemology* (Blackwell, 1985), at p. 1. On the different branches of epistemology, see Stanford Encyclopedia of Philosophy at <http://plato.stanford.edu/entries/epistemology>.

issue of finding the right correspondent, or reference state, with which GES for EU waters can be compared and then assessed.

3.1. *Blind Spots: Inclusion and Exclusion of Factors Describing Good Environmental Status*

The EU is challenged to act in a situation of uncertainty; it must develop and apply scientific concepts to understand the effects of anthropogenic activities and entries to an ecosystem that is not yet well understood.³⁹ The problem that arises from an epistemic point of view is that if criteria and methodological standards contribute to determining ‘what and how we perceive’, they also contribute to ‘what and how we do not perceive’. As the policy-makers legally frame the criteria and methodological standards for what is or could be GES, they not only provide cognitive means for comprehending marine ecosystems and their threats but also the boundaries and limits of our awareness of them.⁴⁰

One may illustrate this by distinguishing those factors, parameters and qualities included in the assessment criteria and standards from those that are not included. Those included have a greater chance of being recognized by policy-makers and scientists assessing and valuing marine waters and defining GES. Those excluded are far less likely to be noticed and included in GES assessment and valuation. I will refer to those factors and qualities that are included in the scientific criteria and methodological standards as being in the ‘epistemic light’, while the others lie in the ‘epistemic fog’.

For example, the scientific knowledge base is particularly uncertain regarding Descriptor 11, which is concerned with the introduction of energy, including underwater noise. As the Commission notes, ‘additional knowledge is required particularly in relation to impacts of introduction of energy on marine life, relevant noise and frequency levels’.⁴¹ Despite these knowledge gaps, Descriptor 11 proposes two different kinds of underwater noise to be considered by Member States in their assessment and valuation of the marine environment: (a) ‘distribution in time and place of loud, low and mid frequency impulsive sounds’; and (b) ‘continuous low frequency sound’. The latter criterion is concretized by the words ‘trends in the ambient noise level within 1/3 octave bands 63 and 125 Hertz (Hz) (centre frequency)’. Given that approximately 75 per cent of all anthropogenic noises in the ocean are induced by vessels⁴² in the frequency bands between 5 and 500 Hz,⁴³ it makes a huge difference for future assessments and evaluations if ‘trends in the ambient noise level within 1/3 octave bands 63 and 125 Hz (centre frequency)’ were excluded from the epistemic focus of Descriptor 11. It must also be

³⁹ See Commission Communications, n. 3 above.

⁴⁰ As L. Wittgenstein elegantly put it: ‘The limits of my language mean the limits of my world’, in *Tractatus-Logico-Philosophicus*, available at <http://filepedia.org/tractatus-logico-philosophicus>, at Section 5.6.

⁴¹ See text to Descriptor 11, Part B, Commission Decision, n. 4 above.

⁴² International Council for the Exploration of the Seas (ICES), Report of the Ad-hoc Group on Impacts of Sonar on Cetaceans and Fish (AGISC), CM 2006/ACE:06 25, Copenhagen, 2005, p. 39, available at http://ec.europa.eu/environment/nature/conservation/species/whales_dolphins/docs/ices_second_report.pdf.

⁴³ National Research Council (NRC), *Ocean Noise and Marine Mammals* (National Academic Press, 2003), at p. 49.

noted that other forms of energy and noise entrances have not yet been addressed by the Commission Decision and thus remain in the 'epistemic fog'. For example, neither the electromagnetic effects of electricity transports through offshore cables nor the entrance of heated water by power plants has been included in Descriptor 11. Furthermore, the Commission Decision does not yet take into account the physical or behavioural effects of noise or energy entrances on fish and particularly on marine mammals.⁴⁴

3.2. Normative Implications of Scientific Criteria and Methodological Standards

Though primarily intended to provide conceptual means to assess and quantify ecosystems, various assessment criteria and methodological standards have substantial normative implications.⁴⁵ Firstly, in the case of the Commission Decision, scientific criteria and methodological standards are included in a legislative act that aims to provide guidance for Member States on how to examine and quantify marine ecosystems and thus to identify GES. Such guidance is normative because it sets a frame of concepts that should be applied by Member States when examining and quantifying ecosystems in terms of GES.

Secondly, scientific criteria and methodological standards can include strong political value judgments. This clearly applies to the Commission Decision. For example, by using the Maximum Sustainable Yield level (MSY level) to set the criteria for GES with regard to the state of commercially exploited fish stocks, the Commission actually promotes a policy which it also currently endorses under the EU Common Fisheries Policy (CFP) – namely, the establishment of the MSY level as a general limit regarding fishing opportunities.⁴⁶ All three alternative assessment and valuation criteria listed in Descriptor 3 of Annex I of the Commission Decision (fishing pressure, reproduction capacity, and population age and size distribution) revolve around the concept of fishing at an MSY level as an indicator for GES. However,

⁴⁴ For current developments, see ICES, n. 42 above. See also Marine Mammal Commission, Advisory Committee on Acoustic Impacts on Marine Mammals, 'Report to the Marine Mammal Commission', Washington DC, 2006, available at: <http://mmc.gov/reports/workshop/pdf/soundFACAreport.pdf> National Research Council (NRC), *Marine Mammal Populations and Ocean Noise: Determining When Noise Causes Biologically Significant Effects* (National Academic Press, 2005). See also A. Gillespie, 'Establishing Reliable Foundations for the International Scientific Investigations of Noise Pollution in the Oceans' (2006) 15(2) *Review of European Community & International Environmental Law*, pp. 221–6.

⁴⁵ From this perspective, the assessment of 'legal implications of scientific criteria and methodological standards' bears close resemblance to the discourse on technical standard setting. See on this, for example, contributions by S. Jasanoff, n. 6 above; K.-H. Ladeur, n. 6 above, pp. 89–99; see also G. Majone, 'The Uncertain Logic of Standard-Setting' (1982) 5(4) *Zeitschrift für Umweltpolitik*, pp. 305–23.

⁴⁶ European Commission, Proposal for a Regulation of the European Parliament and of the Council on the Common Fisheries Policy, COM(2011)425 final, 13 Jul. 2011; European Commission, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions – Reform of the Common Fisheries Policy, COM(2011)417 final, 13 Jul. 2011; European Commission Green Paper – Reform of the Common Fisheries Policy COM(2009)163 final, 22 Apr. 2009, at p. 15; European Commission, Communication from the Commission to the Council and the European Parliament – Implementing Sustainability in EU Fisheries through Maximum Sustainable Yield, COM(2006)360 final, 4 Jul. 2006.

fishing at MSY levels is not necessarily equal to sustainable fishing. In fact, fishing at MSY levels has been subject to debate both from an economic and ecological perspective.⁴⁷ While some argue that fishing at MSY levels does not recognize the needs of multi-species fisheries and ecosystem requirements, others consider it to be a relatively strong restriction or constraint. This is particularly true with regard to the Common Fisheries Policy, under which 88 per cent of the stocks in 2009 were fished beyond the MSY level.⁴⁸ For a long time, Member States have been unwilling to accept the MSY level as a mandatory level of quantitative catch restriction under the Common Fisheries Policy.⁴⁹

Accordingly, the proposed criterion of fishing at MSY levels reads as if the Commission has tried to circumvent the often insurmountable hurdles existing under the Common Fisheries Policy regime where traditionally the fisheries ministries of Member States independently (that is, without the approval of the European Parliament) restrict fishing activities at unsustainable levels.⁵⁰ The Commission Decision thus appears to aim at establishing a highly contested fishing limit below the EU's current environmental policy.⁵¹

3.3. *The Problem of Identifying a Reference Point*

The Commission Decision does not impose a specific definition of GES in marine waters but aims to provide Member States with viable concepts of how to quantify and value their marine waters. It thus still leaves Member States with the practical challenge of establishing points of reference to determine what 'good' means. The question remains: How good is 'good'?⁵² The search for such an 'Archimedean point' is often pursued through the indication of a 'reference state'. However, the difficulties

⁴⁷ S. Iudicello, M.L. Weber & R. Wieland, *Fish, Markets, and Fishermen – The Economics of Overfishing* (Island Press, 1999) at pp. 45–7; T. Markus, 'Making Environmental Principles Work under the Common Fisheries Policy' (2010) 19(3) *European Energy and Environmental Law Review*, pp. 132–44; R. Froese and A. Proelß, 'Rebuilding Fish Stocks No Later than 2015: Will Europe Meet the Deadline?' (2010) 11(2) *Fish and Fisheries*, pp. 194–202. See generally P. Birnie, A. Boyle & C. Redgwell, *International Law & the Environment* (Oxford University Press, 2009), at pp. 199–201.

⁴⁸ European Commission, COM(2009)163 final, n. 46 above, at p. 7.

⁴⁹ S. Villasante, M. García-Negro, F. González-Laxe & G.R. Rodríguez, 'Overfishing and the Common Fisheries Policy: (Un)successful Results from TAC Regulation?' (2011) 12(1) *Fish and Fisheries*, p. 34–50; ICES, 'Environmental Status of the European Seas', Copenhagen, 2003, at pp. 37–42, available at: http://www.ices.dk/reports/germanqsr/23222_ICES_Report_samme.pdf. European Commission, Green Paper on the Future of the Common Fisheries Policy, Vol. 1, COM(2002) 135 final, 20 Mar. 2001, at pp. 6–8; M. Holden, *The Common Fisheries Policy* (Blackwell Scientific Publications, 1996), at pp. 57–60; A. Karagiannakos, 'Total Allowable Catch (TAC) and Quota Management System in the European Union' (1996) 20(3) *Marine Policy*, pp. 235–48, at 244.

⁵⁰ As of 1 December 2009, Arts. 43(2) and 43(3) TFEU (n. 31 above) recognize the role of the European Parliament as co-legislator in all decisions adopted under the CFP except measures on 'fixing prices, levies, aid and quantitative limitations and on the fixing and allocation of fishing opportunities'. See also T. Markus, *European Fisheries Law – From Promotion to Management* (Europa Law Publishing, 2009), at pp. 27–58; L. van Hoof & J. van Tatenhove, 'EU Marine Policy on the Move: The Tension between Fisheries and Maritime Policy' (2009) 33(4) *Marine Policy*, pp. 726–32.

⁵¹ See Art. 192(1) TFEU, n. 31 above.

⁵² See Mee et al., n. 12 above, at pp. 187–204.

associated with this approach seem to be particularly challenging in marine science and policies. The problem may be summarized as follows.

Firstly, ecosystems are unstable and subject to constant change, so any 'unshifting equilibrium' must be regarded as a myth.⁵³ Secondly, if one assumes that 'pristine' or 'untouched' nature would constitute a good reference level, it would be difficult or even impossible to find such an ecosystem in our present space and time.⁵⁴ Thirdly, looking for a reference state in the past is difficult as a result of poor historical data and the challenges of modelling and quantifying changes in the marine environment.⁵⁵ Finally, where reference levels are based on 'human perceptions', baselines tend to shift from generation to generation ('shifting baseline syndrome').⁵⁶ These problems demonstrate the Commission Decision's tentative and preliminary quality and the necessity for it to remain adaptable to new environmental challenges.

3.4. *Preliminary Conclusions*

The examination of the epistemic dimension of the descriptors relating to fisheries and energy entrances points to general aspects of the scientific criteria and methodological standards used to assess and value the status of the environment. Though the descriptors provide useful concepts, they are limited to specific aspects of certain phenomena and thus necessarily restrict a broader understanding. Accordingly, deciding which criteria and standards are to be used (or not used) to assess and quantify ecosystems to a large extent determines which segments of the marine environment, or aspects of certain phenomena, will be recognized under marine environmental law and eventually receive legal protection. Secondly, criteria and standards providing analytical tools may also include substantial value judgments. In that sense, they are highly contestable and thus should be subject to political debate. Thirdly, since criteria and standards do not provide an explicit definition of GES, the meaning of 'good' remains ambiguous. Where reference states are used as heuristic instruments for deciding upon GES, observers may face the transience of ecosystems, the lack of reliable data, or the absence of an untouched and pristine environment.

Overall, scientific criteria and methodological standards have a limited epistemic scope, and include value judgments. Their dimensions, limits and values must be recognized when assessing the quality of any law that provides specific criteria and standards to assess, quantify and value the environment. To increase transparency and allow for an informed dialogue between scientists, policy-makers and the public, the limits and value aspects of scientific criteria and standards should be disclosed as far as possible.

⁵³ W. Howarth, 'The Progression towards Ecological Quality Standards' (2006) 18(1) *Journal of Environmental Law*, pp. 1–25; I owe this reference to M. Lee's article mentioned at n. 26 above, at pp. 31–2. See also B. Pardy, 'Changing Nature: The Myth of Inevitability of Ecosystem Management' (2003) 20(2) *Pace Environmental Law Review*, pp. 675–93, at 684–5

⁵⁴ See Mee et al., n. 12 above, pp. 191–4.

⁵⁵ *Ibid.*

⁵⁶ D. Pauly, 'Anecdotes and the Shifting Baseline Syndrome of Fisheries' (1995) 10 *Trends in Ecology & Evolution*, p. 430, at 430.

4. IMPLICATIONS FOR THE EU MARINE ENVIRONMENTAL POLICY

To illustrate further the relevance and effects of the scientific criteria and methodological standards on the future development of EU marine environmental law, the following two subsections elaborate on the implementation challenges of criteria and standards as well as the role they play in achieving GES by 2020.

4.1. Implementation Challenges of Criteria and Methodological Standards

From an administrative implementation perspective, the design of the criteria and methodological standards creates several practical and theoretical challenges to Member States and EU institutions.

Firstly, even where criteria and methodological standards are established and approved, it does not necessarily follow that they can easily be further developed or applied by EU implementing legislation or Member State administrative action. For example, the criteria for the assessment and evaluation of fish stocks may be regarded as advanced in comparison to many of the other descriptors. However, their application can be hindered by insufficient data availability, as acquiring data is difficult and cost intensive. Because of the general unpredictability of the development of fish populations, in combination with uncertainties in scientific data, many fishing limitations under the CFP are based on broad assumptions. In 2007, only 29 of 126 total allowable catches (TACs) set under the CFP were based on full scientific assessment.⁵⁷ In addition, at present CFP rules facilitate the counting of ‘landings’ rather than ‘catches’, and illegal catches also erode the validity of the available information.⁵⁸ Finally, the transformation of the criteria into effective legal measures governing (and limiting) fishing activities is complex and politically very difficult. The EU’s long-lasting and ongoing struggles in this regard are notorious.⁵⁹

Secondly, it has been observed generally that the complexity of administrative and regulatory problems increases with the advance of scientific knowledge.⁶⁰ This is also true with regard to the process of adopting criteria and methodological standards concerning the descriptor of ‘biodiversity’. To best capture the complexity of biodiversity, several sets of standards were drafted quite broadly. To render these different sets of standards operational, comparable and coherent, however, further specification is needed. This, of course, requires more data and thus more research,⁶¹ which in turn creates costs in respect of monitoring and administration.

Thirdly, the criteria of broad descriptors like ‘biodiversity’ may overlap with the criteria of other descriptors. Practically, these overlaps require delimitation of scopes

⁵⁷ European Commission COM(2007) 295 final, n. 3 above, at p. 5.

⁵⁸ See Art. 3(m), Council Regulation (EC) No. 2371/2002 on the Conservation and Sustainable Exploitation of Fisheries Resources under the Common Fisheries Policy [2002] OJ L358/59.

⁵⁹ See Markus, n. 50 above, at pp. 75–9 and 125–8; see also Markus, n. 47 above, at pp. 132–44.

⁶⁰ See Majone, n. 6 above, at p. 19.

⁶¹ See text of Descriptor 1, Part B, Commission Decision, n. 4 above.

and coordination of the different assessments (which may be carried out by various scientists who may follow different scientific traditions and methodologies). Under the Commission Decision, for example, overlap seems particularly likely in the case of broad descriptors such as Descriptor 1 (biodiversity), Descriptor 3 (population of all commercially exploited fish stock), and Descriptor 4 (marine food webs). Their relationship must be clarified. While Descriptor 3 relates only to commercially exploited fish stocks, Descriptor 4 is more extensive and covers all fish communities. While Descriptors 1 and 3 share the criteria of ‘size and distribution of fish populations’, Descriptor 3 additionally considers their ‘conditions as to their demographic characteristics and genetic structure’. To avoid inconsistencies between the different assessments and to make use of all the available data, those assessments made under other descriptors must be recognized and aligned with each other, despite the fact that this might be extremely challenging with the use of different models and scientific methods. The same potential difficulty applies also to any assessments made under other EU legislation and regional seas conventions such as OSPAR⁶² and HELCOM.⁶³

Fourthly, different marine regions have distinct environmental features and therefore require different sets of assessment criteria. Some problems do not exist in some geographical areas and, therefore, it may not be useful to carry out full assessments in all marine waters. Accordingly, the Commission’s Draft Decision offers Member States alternative criteria as well as the possibility to ‘opt-out’ of using certain criteria where these are deemed inappropriate based on the initial assessment and provided that justification is given to the Commission.⁶⁴ Given the variation in ecosystems throughout the EU, as well as the complexity of some of the criteria (for example, Descriptor 9 – Contaminants in Fish and Other Seafood), this flexible approach seems appropriate. However, descriptors ought to be applied comprehensively in an effort to achieve GES in adjacent and interdependent marine ecosystems, as well as to provide a wide-ranging overview of the status of EU waters.

4.2. *Impacts on the EU’s Future Marine Policy under the MSFD*

In principle, the MSFD requires Member States to achieve GES in their marine environments by 2020. However, they have been left a wide margin of discretion regarding their individual levels of commitment. This applies, to some extent, to the choice of the criteria to be used for the initial assessment as well as to the definition of GES,⁶⁵ since Member States will design and implement their own environmental targets and programmes of measures.⁶⁶ In addition, the MSFD includes a number of broadly drafted exceptions which give Member States a lot of room to limit their

⁶² N. 18 above.

⁶³ N. 19 above.

⁶⁴ See text at Annex I, MSFD, and Annex, Part A, No. 8, Draft Commission Decision, n. 33 above.

⁶⁵ Art. 9(1) MSFD; Annex I MSFD and Annex Part A, No. 8 of the Draft Commission Decision, *ibid*.

⁶⁶ See Arts. 5(2), 10 and 13 MSFD.

commitment to take concrete measures for achieving GES.⁶⁷ For example, Member States are obliged to act only where a ‘significant risk’ to the marine environment exists. In a comparative perspective between Member States, however, the legal concept of ‘significant risk’ (*erhebliche Gefahr* or *risque important*) remains somewhat unclear at this stage.⁶⁸ Given such large discretion, the Member States’ commitment to GES will not be clear until they submit their initial assessments, their definitions of GES and their environmental targets by 15 July 2012.

Nevertheless, despite the implementation challenges and legal reservations under the MSFD and the Commission Decision, the latter is likely to have a significant long-term impact on the marine environmental policies of Member States and the EU. Member States are, under all circumstances, required to make the initial assessment under the terms of the MSFD.⁶⁹ This will certainly increase Member States’ understanding of their marine ecosystems and most likely will also enhance their desire to cooperate and coordinate their efforts in the areas of marine science and governance.⁷⁰ The Commission Decision can be seen as one important contribution to this process. Although the MSFD does not immediately improve existing secondary law or affect the competence order set out in the treaties, environmental policies and goals developed under the MSFD framework and based on the criteria and methodological standards within the Commission Decision must eventually be considered in other EU policies (the Common Fisheries Policy, for example).⁷¹

5. REPRESENTATIVENESS AND ACCEPTABILITY IN ESTABLISHING THE CONCEPTUAL FRAME OF WHAT CONSTITUTES GOOD ENVIRONMENTAL STATUS

It is argued here that the drafting and adoption of the Commission Decision should be seen as a significant exercise of authority. The Commission Decision lays down concepts which help to shape how scientists, policy-makers and lawyers will perceive and value the status of the EU marine environment in the future. Accordingly, the Decision will play an important role in the legal treatment of EU waters under EU law and in the further development of future EU marine policy and law. Such an exercise

⁶⁷ Ibid., Art. 14.

⁶⁸ Ibid., Art. 14(4). I thank Dr Harald Ginzky of the German Federal Environmental Agency for making me aware of this problem. On associated problems, see Markus et al., n. 22 above, at pp. 59–90.

⁶⁹ Arts. 5(1) and 8 MSFD.

⁷⁰ Member States are required to coordinate themselves regionally: see Recital 1 and Arts. 3(9), 5(2), 6 and 8(3) MSFD.

⁷¹ Art. 11 TFEU, n. 31 above. See Art. 12, European Commission, COM(2011)425 final, n. 46 above; see also the European Court of Justice (ECJ) ruling of 9 Sept. 2004 in Case C-127/02, *Landelijke Vereniging tot Behoud van de Waddenzee, Nederlandse Vereniging tot Bescherming van Vogels v. Staatssecretaris van Landbouw, Natuurbeheer en Visserij* (Waddenzee Case), [2004] ECR I-7405; such integration may also be promoted by the Member States under the procedures provided under Art. 15(1) MSFD.

of authority inevitably raises normative issues.⁷² Most notably, the fact that such an important epistemic decision was developed and adopted mainly by a relatively small network of scientific experts and bureaucrats raises the question of whether the Commission Decision sufficiently reflects, acknowledges, and takes into account the many different ideas and perspectives as to what exactly GES might be (representativeness). Given that one could argue that the Decision was arrived at by scientific or bureaucratic fiat, one might ask why such a fundamental decision should be considered valid and effective, and should be accepted by those affected by it (acceptability).⁷³

From a legal point of view, the power to adopt the Decision derives from Article 192 TFEU and was delegated by the European Parliament and the Council to the Commission in accordance with Article 290(1) TFEU.⁷⁴ Article 9(3) of the MSFD states:

Criteria and methodological standards to be used by the Member States, which are designed to amend *non-essential elements of this Directive* by supplementing it, shall be laid down, on the basis of Annexes I and III, ...[emphasis added].

Although the adoption of scientific criteria and methodological standards to assess and quantify the marine environment may be regarded as a *non-essential element* of the MSFD, the question remains as to whether or not the process leading up to the adoption of the Decision guaranteed sufficient representativeness and acceptability. Some traditional mechanisms that create or foster representativeness and acceptability are public participation, consensus, transparency, scientific expertise, explicit statements of reasons for laws and decisions, conformity with higher ranking law, and orientation at generally accepted values. However, it has been widely observed that promoting these features becomes increasingly difficult within highly complex and science-based governance processes, particularly when those processes are multi-layered.⁷⁵ The discourse on legitimacy in transnational administrative standard setting addresses how to develop traditional mechanisms that foster representativeness and acceptability, and how they can be supported in such increasingly complex processes.⁷⁶

Given the close connection between technical standard setting in such contexts and the establishment of assessment criteria and methodological standards under the

⁷² See generally on the normative aspects of the question of ‘whose knowledge is taken seriously’, M. Fricker, *Epistemic Injustice – Power & Ethics of Knowing* (Clarendon, 2007); see also contributions in L. Fortman (ed.), *Participatory Research in Conservation and Rural Livelihoods: Doing Science Together* (Wiley-Blackwell, 2008).

⁷³ For discussions regarding similar or related questions regarding legitimacy in the area of regulatory standard setting, see Jasanoff, n. 6 above, at p. 119; or in relation to the implementation of environmental objectives under the Water Framework Directive, Lee, n. 26 above, at pp. 50–5.

⁷⁴ See n. 31 above.

⁷⁵ F. Scharpf, ‘Legitimationsprobleme der Globalisierung – Regieren in Verhandlungssystemen’, in C. Böhre & G. Wewer (eds.), *Regieren im 21. Jahrhundert* (Leske+Budrich, 1993); U. Schliesky, *Souveränität und Legitimation von Herrschaftsgewalt: Die Weiterentwicklung von Begriffen der Staatslehre und des Staatsrechts im europäischen Mehrebenensystem* (Mohr Siebeck, 2004); M. Herberg, ‘Global Governance Networks in Action: The Development of Toxicological Test Methods at the OECD’, in O. Dilling, M. Herberg & G. Winter (eds.), *Transnational Administrative Rule-Making* (Hart Publishing, 2011), at pp. 79–87.

⁷⁶ See the many different contributions in Dilling, Herberg & Winter, *ibid.*

auspices of the Commission, it is worth looking at the analyses, conclusions and arguments developing within that specific research area in order to address the question of whether the Commission Decision was adopted in a way that sufficiently supports representativeness and acceptability.⁷⁷ A central argument that applies to transnational administrative standard setting is that decision-making by expert committees chronically lacks transparency, participation and parliamentary control. Warning, for example, lists several ‘proven and tested’ strategies that are intended to improve and strengthen legitimacy in the setting of highly technical standards in a supranational expert committee environment:⁷⁸

- accordance with law that lays down the purpose of the technical standards and the level of protection they aim to preserve;
- observation of values;
- outlining the decision rationale and the data used in the decision-making process;
- the disclosure of valuations and uncertainties;
- inclusion of acknowledged experts to guarantee that decisions are based on expertise;
- inclusion of representatives of different risk cultures and scientific backgrounds;
- permission granted to those affected by the decisions and those representing relevant interests to voice their interests;
- guarantee of transparent and predictable committee work;
- public availability of decisions;
- regular review and (if necessary) revision of decisions; and
- inclusion of parliamentarians (if possible).

It is argued here that these strategies to improve legitimacy in transnational administrative technical standard setting can also be of value for increasing representativeness and acceptability in the setting of scientific criteria and methodological standards to assess and value GES. With regard to the establishment of scientific criteria and methodological standards to determine GES, the situation is as follows.

The criteria and methodological standards laid down in the Commission Decision are (a) based on criteria already existing under EU legislation and under regional sea conventions, as well as (b) newly drafted by the Working Group on Good Environmental Status, based on scientific advice from groups of experts (Task Groups) set up and led by the JRC and ICES.⁷⁹ The Working Group followed clear ‘terms of reference’ and the ‘minutes’ have been made publicly available on the internet

⁷⁷ It should be noted here that the particular case of ‘criteria and methodological standard setting’ brings about slightly different challenges from the ‘regular’ regulatory process of technical standard setting: the degree of uncertainty is even higher and the immediate regulatory force is somewhat lower.

⁷⁸ M. Warning, *Transnational Public Governance: Networks, Law and Legitimacy* (Palgrave, 2009), pp. 225–6 and 236.

⁷⁹ DG Sanco (n. 33 above) was responsible for Descriptor 9 – Contaminants in Fish and Seafood for Human Consumption.

(although not by the Commission).⁸⁰ Formally, the Decision was delivered under the regulatory procedure required by Articles 9(3) and 25(3) of the MSFD – that is, the regulatory procedure with scrutiny.

In accordance with this procedure, the Commission drafted a proposal and submitted it for approval to a committee made up of national representatives.⁸¹ After it was approved, the proposal was referred to the Council and the Parliament for scrutiny. Either body could have opposed the adoption on the grounds that the proposal (i) exceeded the implementing power in the basic instrument, (ii) was not compatible with the aim or content of the basic instrument, or (iii) did not respect the principles of subsidiarity and proportionality. In this case, however, both institutions approved the proposal. The Decision was adopted by the Commission and made publicly available in the Official Journal of the EU. The Commission Decision also makes explicit that it is based on insufficient knowledge and is, therefore, preliminary.⁸² It indicates that it will be subject to revision ‘as soon as possible’ after the completion of the Commission’s assessment of the Member States’ notifications under Articles 9(2), 10(2) and 11(3) of the MSFD – that is, following the initial assessment, the determination of GES, and the establishment of environmental targets and monitoring programmes.⁸³

Considerations of acceptability and representativeness did play a role in the adoption of the Decision; it was obviously adopted in compliance with the law, and the procedural requirements under the terms of reference and comitology rules were met. The Commission also indicated many times that the results are preliminary, and are in some areas based on insufficient scientific knowledge. They must therefore be reviewed and, if necessary, revised on a regular basis. The Decision was widely based on scientific advice guaranteeing the inclusion of available knowledge. With regard to transparency, assessments of the scientific advisory groups (Technical Groups) set up and led by ICES are all available on the internet and the responsible scientists can be identified. The Working Group also included experts from non-governmental organizations who were entitled to submit their opinions. A major public conference was held in Brest (France), at least in part to ignite a widespread discourse on the development of criteria and methodological standards. Finally, the Decision was subject to scrutiny by the Council and Parliament. It should also be emphasized that

⁸⁰ The Commission was asked by stakeholder representatives whether they were allowed to further distribute the Working Group documents. The Working Group’s chairman responded that ‘participating organizations were allowed to further distribute internally Working Group meeting documents to facilitate and prepare their participation. However, in case of further document distribution, it may be helpful if participants can provide sufficient context to the information distributed so that any feedback can be sufficiently targeted’: European Commission, Directorate-General Environment, Working Group on Good Environmental Status of the Marine Strategy Framework Directive Common Implementation Strategy, Draft Minutes of Meeting, 14 May 2009.

⁸¹ Art. 5(a), Council Decision 468/1999/EC laying down the Procedures for the Exercise of Implementing Powers Conferred on the Commission [1999] OJ L184/23, as amended.

⁸² Recital 3, Commission Decision, n. 4 above.

⁸³ *Ibid.*, Recital 4.

of all the comitology procedures, the regulatory procedure with scrutiny includes Parliament to the largest extent.⁸⁴

However, some areas of concern remain. Firstly, the decision-making process regarding whom to appoint to the Task Groups lead by ICES and the JRC remains somewhat unclear (at least for the interested outside observer). The same applies to the non-publication of the work and proceedings of the Working Group by the Commission. Although the Commission did generally allow participants to distribute information to the public, it did not systematically provide such information itself. The non-publication makes it difficult to assess the degree of prevailing uncertainty, to trace who finally decided which criteria to include in the Commission Decision, and for what reason. Finally, even though it would be difficult at this stage to argue that specific values have not been observed, future amendments must ensure that environmental principles will be observed. This applies, particularly, to the precautionary principle, which is binding under EU law and applies in situations of uncertainty.⁸⁵ At this point in time, the Commission Decision does not indicate how the precautionary principle will be implemented for the establishment and application of criteria and methodological standards.

6. CONCLUSIONS

This article highlights the Commission Decision's importance from a basic epistemic and normative perspective and elucidates its legal, administrative and political implications in relation to the EU's marine environmental policies and laws. The consequences of the scientific criteria and methodological standards adopted in the Commission Decision have been discussed; those criteria and standards will contribute to the shaping of the conceptual frames used by those who develop and apply the EU's marine environmental policies and regulations in the future. To a large degree, these conceptual frames determine the way in which policy-makers and lawyers perceive and value the marine environment. For illustrative reasons, three of eleven descriptors have been examined in greater detail. It was found that criteria and methodological standards can only explain to a very limited extent the functioning of complex ecosystems and the causal effects of anthropogenic entries (such as energy entrances, including underwater noise). It has also been pointed out that criteria may be highly value-laden and politically motivated (especially with regard to fisheries, for example). Where 'reference states' are being used to define GES, adequate correspondents are hard to find or are difficult to model because of a lack of reliable information or data.

The Commission Decision's role with regard to the development of the EU's future marine policy and law was also highlighted. Practically speaking, criteria and methodological standards may be difficult to implement as a result of a lack of data, existing political structures, increasing complexities brought on by the advance of scientific

⁸⁴ B. de Witte et al., 'Legal Instruments, Decision-Making and EU Finances', in P.J.G. Kapteyn et al., *The Law of the European Union and the European Communities* (Wolters Kluwer, 2008), pp. 342–6.

⁸⁵ Art. 191 TFEU, n. 31 above.

knowledge, overlap of scopes, or the distinct qualities of marine waters which render a uniform application useless. Nevertheless, the requirement to make an initial assessment of marine waters based on common criteria and methodological standards will improve Member States' understanding of their marine ecosystems, and is also likely to enhance their cooperation and coordination regarding marine science governance and other related matters (including fisheries and even traffic regulation). Finally, the drafting and adoption of the Commission Decision was judged to be a significant use of authority which provoked normative questions of representativeness and acceptability. It was concluded that the adoption process of the Commission Decision could still be improved in the future. The Commission should consider making more transparent the criteria used as the basis for the appointment of scientists to the Technical Groups. Furthermore, it should systematically make available the documents it and the Working Group on Good Environmental Status use to make their recommendations, statements and decisions. Only a fully transparent procedure will allow outside observers to trace and comprehend the uncertainties and value judgments incorporated into highly sophisticated expert legislation like the Decision. Such a procedure would also empower outside observers to participate in future changes or reviews of the process.

Where the law defines methodological standards and scientific criteria, it conditions the minds of scientists, lawyers and policy-makers regarding how they think about nature. This article has investigated the complex relation between science, methodology, norms and values in the context of the EU's marine strategy and showed how newly established or modified legal concepts shape the way in which actors perceive and value the marine environment and, thus, how they develop and apply marine environmental law, now and in the future. As a consequence, the establishment of methodological standards and scientific criteria implements and, at the same time, alters scientific knowledge and normative values.