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Report of the JRC's Descriptor 1 workshop to support the review of the Commission Decision 2010/477/EU concerning MSFD criteria for assessing Good Environmental Status

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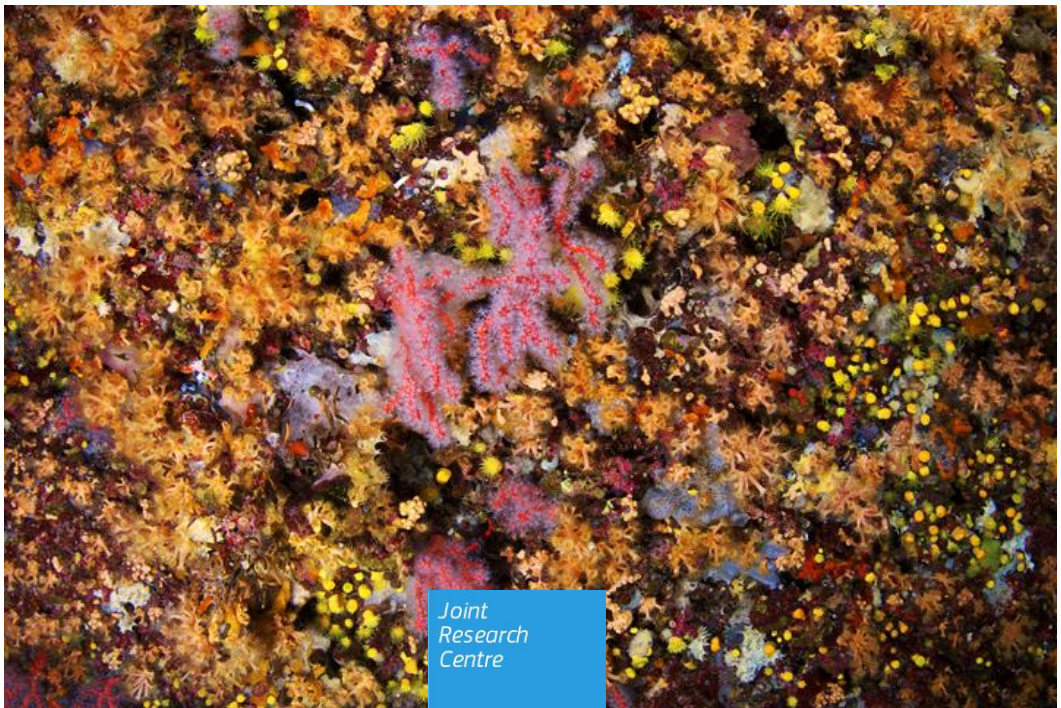

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Abstract

The MSFD workshop on biodiversity (MSFD D1), held in Ispra JRC (7th-9th of September 2015) aimed to provide clear proposals and conclusions on some of the outstanding issues identified in the D1 review process and included in the review manual (D1 review version, May 2015: https://circabc.europa.eu/w/browse/46d2b7ba-d2fd-4b3c-9eaf-18c7cb702b53) in support to the review of Commission Decision 2010/477/EU. This report is complementing the Commission Decision 2010/477/EU review manual (JRC96521) and presents the result of the scientific and technical review concluding phase 1 of the review of the Commission Decision 2010/477/EU in relation to Descriptor 1. The review has been carried out by the EC JRC together with experts nominated by EU Member States, and has considered contributions from the GES Working Group in accordance with the roadmap set out in the MSFD implementation strategy (agreed on at the 11th CIS MSCG meeting).

The main issues addressed and tackled in this workshop's report are:

- Common lists of elements for the biodiversity assessments (species & habitats)
    - Review of the "Biological Features" in Table 1 in the MSFD Annex III in relation to D1 requirements
    - Review of the "Habitat Types" entries in Table 1 in the MSFD Annex III in relation to D1 requirements
- Selection/deselection criteria for the inclusion of species and habitats in a group
- Updated criteria and indicators for D1
- Habitat/Bird Directives, WFD, Common Fisheries Policy and D1
    - Use of species and habitats for the MSFD needs that are already included in other legislation and agreements
    - Links between status classification approaches (FCS vs GES, GEcS vs GES)
- Streamlining of assessments, including scales of assessments
- Cross-cutting issues related to D1 implementation
    - Aggregation rules within D1 criteria/indicators
    - Final GES integration across descriptors assessments

Steps forward and technical needs for D1.

1. Introduction

The MSFD workshop on biological diversity (D1), held in Ispra JRC (7th-9th of September 2015) aimed to provide clear proposals and conclusions on some of the outstanding issues presented in the D1 review process and included in the review manual (D1 review version, May 2015: https://circabc.europa.eu/w/browse/46d2b7ba-d2fd-4b3c-9eaf-18c7cb702b53) in support to the review of Commission Decision 2010/477/EU. The issues discussed proved highly complex with many differing views on needs and suitable ways forward. Discussion was lively and informed, as the group was both small and very experienced. This report intends to complement the review manual for D1, further support the review process, feed the drafting of the revised Commission Decision on criteria and methodological standards on good environmental status of marine waters and define the way forward on further technical and scientific needs.

The outline of the report follows the workshop's agenda (Annex I), focusing on the following major issues:

- Common lists of elements for the biodiversity assessments
- Habitat/Bird Directives, WFD, Common Fisheries Policy and D1
- Cross-cutting issues related to D1 implementation
- Changes in D1 criteria

The participants of the workshop are listed in Annex II.

2. Common lists of elements for the biodiversity assessments

For a coherent and comparable implementation of D1, the assessment of biodiversity through a defined set of functional groups and predominant habitats was identified as a major issue. To that end, a revision of the SEC 2011/1255[1] related tables (3 and 7) was proposed in the review process and took part in the workshop. This task should be also reflected in the MSFD ANNEX III review and the revised text of the COM DEC 2010/477/EU.

The expert group suggested that the MSFD assessments should be reported at the level of functional group and predominant habitat type, which effectively cover the whole range of biodiversity. Their assessment should be made through selected representative sets of species and habitats that will, thereinafter, be aggregated up to these broader levels (cf. paragraph 5.1), according to a methodology and rules which are still to be defined. Predominant habitats should also be assessed via the footprint of impact from pressures (especially physical loss and damage, eutrophication and NIS). It was recommended that the term 'functional group' should be replaced by the term 'species group' as the actual groups variously reflected taxonomic groupings, feeding types and/or habitat preferences. In a same way, and to be clearer and coherent, predominant habitat was replaced by "habitat group".

The list of species (former functional) groups and habitats (former predominant) groups was reviewed and modified (simplified) to take account, *inter alia*, of recent advice (e.g. ICES working group on birds) and new proposals for the EUNIS 2015 habitat classification, and for fish (during the workshop). It was agreed that the EUNIS classification should be the operational typology used for MSFD purposes.

2.1 Review of the "Biological Features" in Table 1 in the MSFD Annex III in relation to D1 requirements

The revision of the SEC 2011/1255 Table 3 of functional groups concluded in the following table (Table 1), where the MSFD terminology was also revised. There is no change in the biodiversity components (Birds, Mammals, Reptiles, Fish and Cephalopods) of the highly mobile and dispersed species. Each one includes revised **biodiversity groups** (species/functional groups), that should be the main assessment unit for the D1 reporting, through representative **biodiversity elements** (species).

Representative species (biodiversity elements) within each group should be accounted for in sufficient number in order to ensure a robust representativeness of the Biological Diversity (D1) GES assessment, and for this a *de minimum* approach was discussed in terms of adequate numbers of species to consider within each group. The selection of species within those proposed groups (**Table 1: Biodiversity elements**) should respect the list of criteria specified in paragraph 2.3. Additionally, it is suggested to consider all species for which data/assessments are already available under the Habitats & Birds Directives (further discussed in a following section) and to be in line with latest changes/agreements with the RSCs.

[1] http://ec.europa.eu/environment/marine/pdf/SEC_2011_1255_F_DTS.pdf

Table 1. Biodiversity Components and elements (highly mobile species) to be considered within D1 assessment (modified from Table 3 of the SEC 2011/1255) as minimum requirement.

Biodiversity Components	Biodiversity groups (assessment units): Species group
Birds	1. Grazing feeders 2. Wading feeders 3. Surface feeders 4. Pelagic feeders 5. Benthic feeders
Mammals	1. Small toothed cetacean 2. Deep divers toothed cetacean 3. Baleen whales 4. Seals
Reptiles	1. Turtles
Fish	1. Coastal 2. Pelagic fish & elasmobranchs 3. Demersal fish & elasmobranchs 4. Demersal deep-sea fish & elasmobranchs
Cephalopods	1. Coastal/shelf pelagic cephalopods 2. Deep-sea pelagic cephalopods

Note: D1 Indicators and criteria (at species level) have to be assessed for each individual species selected; and then all species assessments have to be aggregated (cf. 5.1) under each of the species groups (assessment units) as a minimum requirement. Species assessed under the Habitat (92/43/CEE) and Bird (2009/147/CE) Directives can be used for the species to consider for the MSFD D1 assessment, but other species can be used/added, to fulfil selection criteria (cf. 3.2) and representativeness of each species groups. For the fish groups, commercial species assessed under CFP can be used, but have to be complemented by other species, to also reflect primary (de)selection criteria (cf. 2.3). Invertebrates, algae and other benthic and pelagic (less mobile) organisms are assessed at the community level, in habitats. Any relevant species not considered as minimum requirements and not covered by the above grouping, but which are considered important (sub-regionally) to be accounted for in D1 assessment should be included by the Member States/Regional Sea Conventions e.g. some Diadromous Fish at certain stages of their life cycle. The expert group concluded that more effort is needed to further define and clarify fish groups. The option of having sub-groups seemed helpful, without being able to end up with a final proposal. Coastal has to be specified (taking into account other legislations – WFD, CFP, etc.). Indicatively, pelagic species can constitute two sub-groups: i) Small pelagics (e.g. sprat, herring, mackerel) and ii) Large pelagics (e.g. blue shark, tuna, swordfish). The expert group also proposed to group teleosts and elasmobranchs in a single category, in contrary to the current grouping in the CSWD (2011), to enhance the statistical inference and facilitate the GES definition at that level.

2.2 Review of the "Habitat Types" entries in Table 1 in the MSFD Annex III in relation to D1 requirements

The EUNIS classification system is recommended as the basic common EU standard for MSFD habitat assessments. The expert group revised Table 7 (SEC 2011/1255) on the predominant habitat types concluding to Table 2 for the proposed updated list of biodiversity components and groups for habitats to be used for MSFD assessment (MSFD terminology is also updated accordingly). Table 3 illustrates the links across habitats groups (to be reported) and EUNIS level 2 typology. The group also concluded on the following:

a. According to experts and Berg *et al*. (2015)[2], the terms **'Benthic** habitats' and '**pelagic** habitats' should replace the terms 'seabed habitats' and 'water column habitats', and other relevant terms used in MSFD and GES EC Decision (notably in D1, D4 and D6) to improve coherence and clarity.
b. **Plankton** (phyto, zooplankton and other pelagic organisms) will be addressed as biological part of the pelagic (former water column) habitats, at community level;
c. **Benthos** (phyto, zoobenthos and other benthic organisms) will be addressed as biological part of the benthic (former seabed) habitats, at community level (following the EUNIS typology);
d. **Habitats** - the selection of representative habitats within those proposed habitat groups (see Table 2: **biodiversity habitat groups**) should respect the list of criteria specified in paragraph 2.3. Additionally, it is suggested to consider all habitats for which data/assessments are already available under the Habitats or Water Framework Directives (further discussed in a following section) and to be in line with latest changes/agreements with the RSCs. Besides, it was recognised than new objectives and monitoring is required for MSFD issues (not covered by other Directives), notably for habitats (both benthic & pelagic).

[2] Berg T., Fürhaupter K., Teixeira H., Uusitalo L., Zampoukas N., 2015. The Marine Strategy Framework Directive and the ecosystem-based approach – pitfalls and solutions. Marine Pollution Bulletin 96, pp. 18–28

Table 2. Revised list of biodiversity components and groups (former predominant) for habitats, as minimum requirement for MSFD reporting.

Biodiversity Components	**Biodiversity habitat groups**
Benthic (former seabed) **habitats**	Littoral rock and biogenic reef Littoral sediment Infralittoral rock and biogenic reef Infralittoral coarse sediment Infralittoral sand Infralittoral mud Infralittoral mixed sediment Circalittoral rock and biogenic reef Circalittoral coarse sediment Circalittoral sand Circalittoral mud Circalittoral mixed sediment Upper bathyal rock and biogenic reef Upper bathyal sediment Lower bathyal rock and biogenic reef Lower bathyal sediment Abyssal rock and biogenic reef Abyssal sediment
Pelagic (former water column) **habitats**	Coastal Shelf Oceanic

Note: D1 Indicators and criteria (at habitat level) of the MSFD D1 assessment have to be assessed for each representative habitat selected (EUNIS level 4/5); and then all representative habitat assessments have to be aggregated (cf. 5.1) under each of the habitat groups (assessment units) as a minimum requirement. Habitats assessed under the Habitat (92/43/CE) and Water Framework (2000/60/CE) Directives can be used for the representative habitats to consider for the MSFD D1 assessment, but other habitats have to be used/added, to fulfil selection criteria (cf. 3.2) and representativeness of each habitat group.

Table 3. Correspondence between biodiversity habitats groups (minimum requirements) and proposed EUNIS 2015 typology. Red lines delineate revised benthic habitats groups from Table 2 (minimum requirement for MSFD reporting) and their allocation to the new EUNIS classification level 2 (2015 EEA proposal); Black lines delineate further optional subdivision of these habitats groups, reflecting previously used classification in EUNIS, and (sub)regional specificities.

		Hard	Hard/sediment	Sediment				Other
	EUNIS Level 2	Rock*	Biogenic habitat (flora/ fauna)	Coarse	Mixed	Sand	Mud	e.g. non-oxygen-based habitats
Photic	Littoral							
	Infralittoral							
	Circalittoral							
Aphotic	Bathyal							
	Abyssal							

*Includes soft rock - marls, clays-, artificial hard substrata

The group proposed that:

1. the MSFD biodiversity habitats groups are aligned with the proposed 2015 EUNIS classification (level 2);

2. for MSFD reporting, some habitats groups are groupings of the new 2015 EUNIS level 2 classes, according to the red lines in table 3 (minimum reporting requirements).

Member States may optionally choose to subdivide these red categories according to the thick black lines (Table 3), particularly to ensure that specific pressure/impacts on these finer units are not unduly masked by the higher aggregation). This could be regionally specific, notably for the upper and lower circalittoral extents, or for those countries with larger sea areas. Consequently, further alignment are needed between MSFD minimum requirement level for habitats, and EUNIS corresponding level, since the distinction between upper and lower circalittoral zones is now defined at level 4 in the new EUNIS classification (EEA 2015 proposal). The upper and lower bathyal zone

split is retained because the lower bathyal and abyssal zones are typically subject to lower intensity of pressures, and fewer types of pressure, notably those due to fisheries. This split for bathyal habitats (benthic and pelagic) can also be related to specific representative communities, also indirectly linked with mammal's use of these habitats (e.g. deep diver cetaceans).

The expert group also concluded on the fact that a set of representative habitats (habitats selected according to the 2.3 criteria, most probably at EUNIS level 4/5 or drawn from special/listed habitats) will have to be assessed to represent habitats groups (EUNIS level 2). The exact aggregation process (method and rules) from the representative habitats (EUNIs level 4/5) to the habitat group (EUNIS level 2) needs to be further developed (work in progress as regional processes in RSCs), but the general principle is illustrated in Figure 1. Further work is also needed to clarify whether the representative habitats will be aggregated inclusively into a habitat group (circallittoral sand in Fig. 1), or primarily to:

i) special habitats defined by HD (H1 in Fig. 1)
ii) special habitats defined by the RSCs (H2 in Fig. 1) and
iii) representative habitats of MSFD interest

and secondary to the habitat group level.

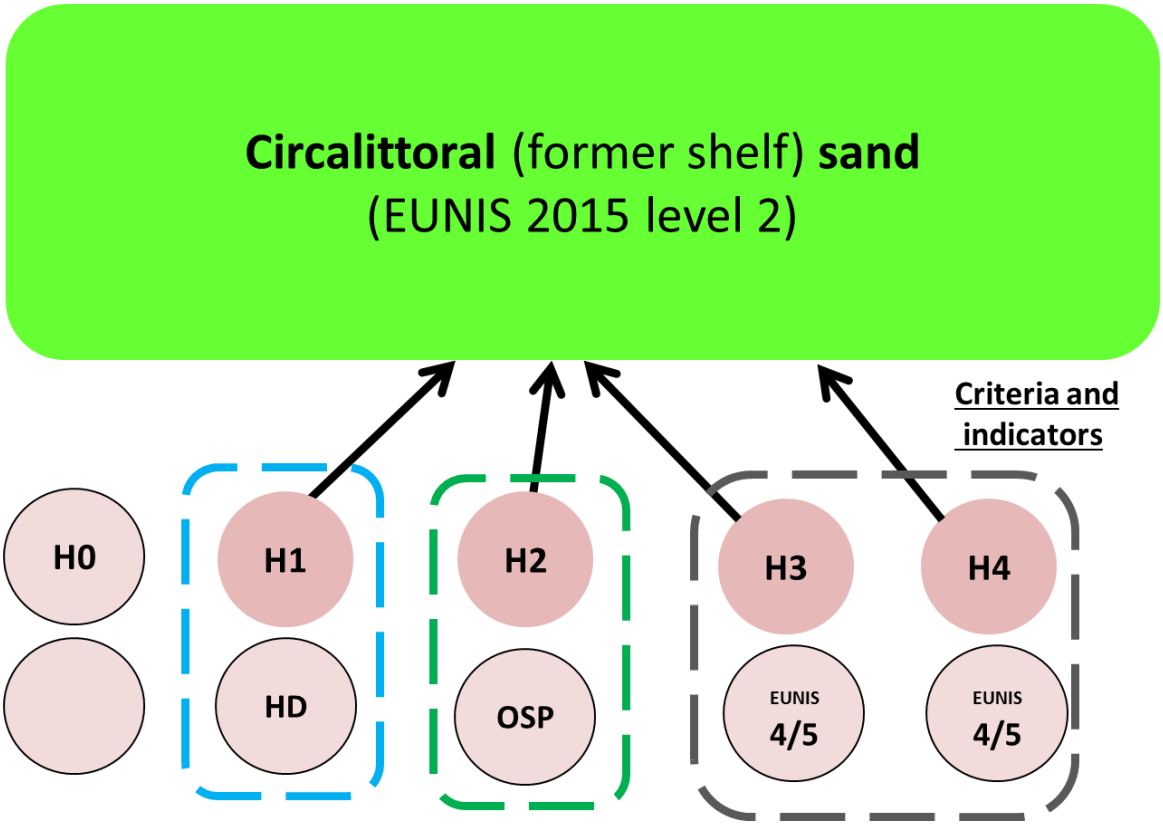

Figure 1. Illustration of the assessment of a habitat group showing the aggregation of representative habitats (circles H1, H2, H3 and H4) to a predominant habitat at EUNIS level 2 (e.g. circalittoral -former shelf- sand). HD = H1 listed in Habitat Directive; OSP = H2 listed in OSPAR (Regopnal Sea Convensions); H3 and H4 = not listed but representative habitats for MSFD; H0 = habitat community (EUNIS level 4/5) of this habitat group (e.g. circalittoral sand here),but not

selected as representative, according to selection criteria (cf. 2.3). Note: further work is needed to detail the aggregation process (method and rules) at this stage (work in progress in RSCs).

2.3 Selection/deselection criteria for the inclusion of species and habitats in a group

Proposed criteria for the selection of species and habitats to be assigned to the new species and habitats groups. The first set of criteria are scientific and based on ecological relevance. The second set of criteria take into account practicalities such as monitoring and and technical fesibility.

Primary scientific criteria – ecological relevance for D1:

- Representativeness of an ecosystem component (species or habitat group): i.e. relevance for assessment of state/impact and/or relevance for assessment of pressure/activity.
- Species/ habitats vulnerable (=exposed) to a pressure, to which it is sensitive;
- Key functional role of species/habitats (e.g. high or specific biodiversity, productivity, trophic link, specific resource or service, etc.)
- Sufficiently present across (sub)region: high proportion (extent or occurrence) of species/ habitat occurs within the specific region or sub-region (i.e. '*commonness'*)
- Present in sufficient numbers: to be able to construct the indicator

Secondary practical criteria: Practical consideration, but which cannot substitute to primary requirements:

- Monitoring/technical feasibility
- Monitoring costs
- Reliable time series

Regarding species selection, it has to be considered that species assignment to 'species group' will ensure that within each ecosystem component (e.g. birds), the full range of ecological functions performed by members of the component is represented within the group of species for which species-level indicators (e.g. population abundance) will be assessed. Furthermore, different species groups tend to be particularly sensitive, and therefore potentially at risk from, the pressures associated with specific human activities.

The representative set of species and habitats of biodiversity groups to be assessed for the MSFD minimum requirement can be (sub)regionally specific. These sets could include species and habitats from those on existing policies (Birds, Habitats Directive, Common Fishery Policy, Water Framework Directive) and international agreements (Regional Sea Convention) or other sources. It was recognized than new requirements (monitoring and assessment) will be needed for MSFD implementation issues (notably for fish, cephalopods and habitats). The set of criteria for their selection (and deselection) will ensure consistency across Europe. The more species/habitats that will be included, the stronger the assessment would be (i.e. greater confidence).

3. Updated criteria and indicators for D1

The following list includes the revised criteria and indicators for the MSFD D1 considering both the review manual for Descriptor 1[3] and the workshop's outcome.

Species Level

1.1 Species geographic distribution

- 1.1.1 distributional range
- 1.1.2 distributional pattern, where relevant
- 1.1.3 area covered by species, where relevant

1.2 Population size

- 1.2.1 population abundance and/or biomass, as appropriate

1.3 Population condition

- 1.3.1 Population demographic characteristics (e.g. body size or age class structure, sex ratio, fecundity rates, survival/ mortality rates)

1.4 Mobile species community composition

- 1.4.1 Relative abundance of community elements (e.g relative abundance of species; relative abundance of large/small individuals; relative abundance of sensitive/resilient individuals).

Habitat level

1.5 Habitat geographic distribution and extent

- 1.5.1 Distributional range
- 1.5.2 Distributional pattern
- 1.5.3 Habitat extent (area and volume)

1.6 Habitat condition

- 1.6.1 Condition of the typical species and communities
- 1.6.2 Relative abundance and/or biomass, as appropriate

3.1 Justification for omitting criterion 1.7 "Ecosystem structure" from D1:

Assessment of the overall status of the marine ecosystem, its ecological functionality and capacity to supply the appropriate range of ecosystem goods and services associated with sustainable levels of exploitation, is the overarching goal of the MSFD. As such this is difficult to adequately capture through the assessment of one, or a few, individual Indicators; those proposed under Descriptor 4 for food webs can be considered to partially address this aspect. Instead the assessment of ecosystem level status should emerge as an outcome of the overall assessment process: the integrated ecosystem assessment applied across all Indicators, Criteria and Descriptors listed in the Decision document.

[3] https://circabc.europa.eu/w/browse/46d2b7ba-d2fd-4b3c-9eaf-18c7cb702b53

The Article 12 reporting confirms that Member States were having considerable difficulty with proposing Indicators to address Criteria 1.7, and this is directly linked to the current state of the science in this regard. Currently few, if any individual indicators have been proposed that reflect variation in ecosystem level processes (i.e. across all aspects {e.g. distribution, abundance} of all ecosystem components {e.g. Birds; Mammals, Fish, Benthic Habitats, Pelagic Habitats}).

3.2 Justification of inclusion of 1.4 under "species level" in conjugation with the elimination of 1.7

Those indicators that were proposed by member states to fulfil indicator 1.7.1 role tended to be 'community-level' metrics (e.g. the Large Fish Indicator; Species Diversity metrics, etc.) applied to mobile species communities (e.g. fish species assemblages). A major reason for this is that, whilst the concept of the 'community of interacting species' is captured within the Habitat-Level Criteria (former 1.4-1.6), so that 'community-level' metrics (e.g. the multi-metric indicator) have been proposed by Member States to support these Criteria, this concept is not similarly captured within the three Species-Level Criteria (1.1-1.3). Criteria 1.1 (species population distribution), 1.2 (species population abundance) and 1.3 (species population condition) all require metrics that relate to individual species. Consequently, to fill the perceived gap in 'community-level' indicators, some Member States proposed 'community-level' metrics at the Ecosystem-Level Criterion (Indicator 1.7.1), in the implementation of MSFD Art. 8, 9 and 10 in 2012. However, this was not really appropriate, and as a result has led to inconsistency in the way that Member States have addressed Criterion 1.7. The elimination of Criterion 1.7, does not address this gap in the Species-Level Criteria/Indicators. Since describing variation in species diversity (the distribution of individuals between species) is widely perceived as an essential aspect of describing variation in overall biodiversity, there is still a need for community-level metrics that address the relative proportions of different elements (species/habitats) and the species diversity (e.g. species, functional units {e.g. length groups of fish}, etc) within communities of interacting mobile species. To address this gap, the addition of a fourth Criterion (1.4) to the current list of three Species-Level Criteria is proposed, along with its associated indicator function:

1.4 Mobile species community composition

Relative abundance of community elements (e.g. relative abundance of species; relative abundance of large/small individuals; relative abundance of sensitive/resilient individuals).

4. Habitat/Bird Directives, WFD, Common Fisheries Policy and D1

Under these issues the expert group discussed the following:

1. Use of species and habitats for MSFD needs which are already included in other legislation and agreements
2. Use of assessments at a criterion or species/habitat level for the MSFD needs
3. Links between status classification approaches (FCS vs GES, GEcS vs GES)
4. Streamlining of assessments, including scales of assessments

4.1 Use of species and habitats for the MSFD needs that are already included in other legislation and agreements

The selection of species to include in the MSFD D1 assessment could either a) take all species assessed under Bird[4] & Habitat Directives that occur in a MS Marine region, for which FCS assessments are available; or b) follow the criteria suggested in D1 workshop to select common subsets of species. In both cases, species are to be grouped within 'Species groups' as defined in Biodiversity Components (Table 1). As shown in the assessment schemes for species (Fig. 2, in paragraph 5.1) and habitats (Fig. 1), those components that are already included in lists of other pieces of legislation and agreements should be considered for the MSFD needs, if relevant (cf. selection criteria in 2.3), by feeding the lower level in the assessment schemes (representative species and habitats of respective biodiversity groups). In general it was recognized that the basic elements of the Habitat and Bird Directives could and should be used to contribute to D1 MSFD assessments in relation to specific criteria (Table 4), at least for the species for which data are available in those Directives. In this sense, considering the 'highly mobile species' referred to in the MSFD (birds; mammals; reptiles), the HD (FCS) assessments for each species could be used for the assessments of these highly mobile species in D1, particularly to inform on criteria 1.1 Species distribution and 1.2 Population size. 'Fish', however, are only marginally covered in the HD and some relevant species for contribution to D1 MSFD assessment, are more likely to be drawn from CFP assessments.

[4] FCS assessments are currently NOT done for individual birds under the Birds Directive. Species reports are produced that contain information such as pop size, trends, distribution. There are no targets but the trends coming out of the reporting under the Birds Directive can be used for the MSFD assessments.

Table 4. Correspondences of criteria used for assessment of species under various policies.

MSFD (D1, 3)	Birds & Habitats Directives[5]	HELCOM[6] (IUCN 2008 criteria)	OSPAR Texel-Faial criteria[7]	UNEP/MAP EcAp	IUCN Red List
Distribution (1.1)	**Range**	Geographic range size and fragmentation	Decline (occurrence in area/extent)	Species distributional range	Range (EOO, AOO)
Population size (1.2); reproductive capacity (3.2)	**Population**	Declining population, small or very small population size	Decline (numbers)	Population abundance	Population size Small population
Population condition (1.3); age & size distribution (3.3)			Decline (quality)	Population demographic characteristics	Mature individuals incl. above
	Habitat for species				Habitat quality incl. in Range
	Future prospects	Included above	Included above		Included above
		Quantitative analysis of extinction risk (e.g. population viability analysis)	Global proportion Regional importance Rarity Sensitivity Keystone species		

4.2 Use of overall assessments and assessments at a criterion level for the MSFD needs

The relevant data acquired under Habitats and Birds Directives (i.e. for common species and habitats of representative sets of biodiversity groups) should be re-used as much as possible (mostly at species level) to optimize monitoring requirement to be met for both policy needs. MSFD should use as far as possible the same data (in species level mostly) as in other policies, but the species level assessment and interpretation of these data could be different under the MSFD because HD additionally uses the criterion 'future perspectives' which can alter the final assessment (i.e. whether

[5] https://circabc.europa.eu/w/browse/0de47902-0a08-41dd-943c-520066a3c529

[6] HELCOM, 2013 HELCOM Red List of Baltic Sea species in danger of becoming extinct. Balt. Sea Environ. Proc. No. 140. http://helcom.fi/Lists/Publications/BSEP140.pdf

[7] OSPAR. 2003. Criteria for the Identification of Species and Habitats in need of Protection and their Method of Application (The Texel-Faial Criteria). Reference no. 2003-13

the species/habitat is at FCS). It was definitively expressed by several experts, before (D1 review manual and comments) and during the workshop, that all Directives have different aims and thus, even if common representative species or habitats can be used, the assessment results (answer to respective objectives) should be different, resulting from different aggregation rules and different integration of assessments.

4.3 Links between status classification approaches (FCS vs GES, GEcS vs GES)

Direct link between the status classification (FCS vs GES, GEcS vs GES; Figure 2) is not feasible due to the different objectives across the Directives and differences in the aggregation methods (e.g. “One Out All Out” rule not qualifies for all MSFD stages of aggregation) applied to the assessment components and groups. The MSFD D1 requires that additional criteria are assessed (i.e. 1.3 Population condition and the newly proposed & 1.4 Community structure) to assess GES. These are not present in the HD, BD, CFP and WFD assessments.

Reporting schedules differ between Directives. Splitting reporting periods, for specific elements within a Directive to meet other Directives needs, would cause practical problems and was not advised.

4.4 Streamlining of assessments, including scales of assessments

Scale of the assessments across directives was discussed. Although the HD & BD overall assessments coincide spatially with the MSFD Marine Regions, the smallest unit of assessment in the Nature Directives is the Marine biogeographical region of the Member State's marine waters. This could pose some issues for some elements. For habitats the assessments are also available at MS level for the different marine regions their waters may encompass. For birds, some assessments concern the species biogeographic distribution (flyways). The assessments should be undertaken at the most appropriate geographic scales (nested assessment scales within MSFD regions/subregions, as being developed by HELCOM and OSPAR). Assessments being done via RSCs (OSPAR, HELCOM) will lead to development of common methodologies, including threshold values for indicators/criteria, and consistent underlying data for the indicator.

5. Cross-cutting issues related to D1 implementation

5.1 Aggregation rules within D1 criteria/indicators

Aggregation rules were discussed at several levels of the assessment process in relation to the assessment groups and elements, the MSFD objectives, the assessment at a criterion level and across criteria.

GES in D1 is to be defined at the level of Species groups and Habitats groups (Tables 1 and 2). For this, the first step is, for each species (or habitat) considered, to take into account all proposed criteria as meaningful and adequate, for e.g. each species consider criteria 1.1 to 1.3. Then, the aggregation of species/habitats individual assessments is done within the above mentioned groups to end up with an assessment of the relevant species group (incorporating the new added criterion 1.4) or habitat group (Fig. 2 and Fig. 3).

As for the most adequate methods of aggregation at each level, it was discussed that:

- The weighted average could be a possible aggregation method at the level of the species, for example;
- The One-out-all-out principle (as applied in the WFD, for example) was not considered adequate for species aggregation to species group level under D1, considering the MSFD context and rationale, but could be considered at a lower level of aggregation (criteria for a species) within a group;

In any case it was acknowledge that the way forward to select aggregation rules should include some testing of the available and most adequate options with real data; analysing the implications, advantages and disadvantages of each method. It was also mentioned that recent scientific literature and R&D projects have provided a huge amount of guidance on this topic (e.g. Patricio *et al.*, 2014[8]).

[8] Patrício J, Teixeira H, Borja A, Elliott M, Berg T, Papadopoulou N, Smith C, Luisetti T, Uusitalo L, Wilson C, Mazik K, Niquil N, Cochrane S, Andersen JH, Boyes S, Burdon D, Carugati L, Danovaro R, Hoepffner N. 2014. DEVOTES recommendations for the implementation of the Marine Strategy Framework Directive. Deliverable 1.5, 71 pp. DEVOTES project. JRC92131

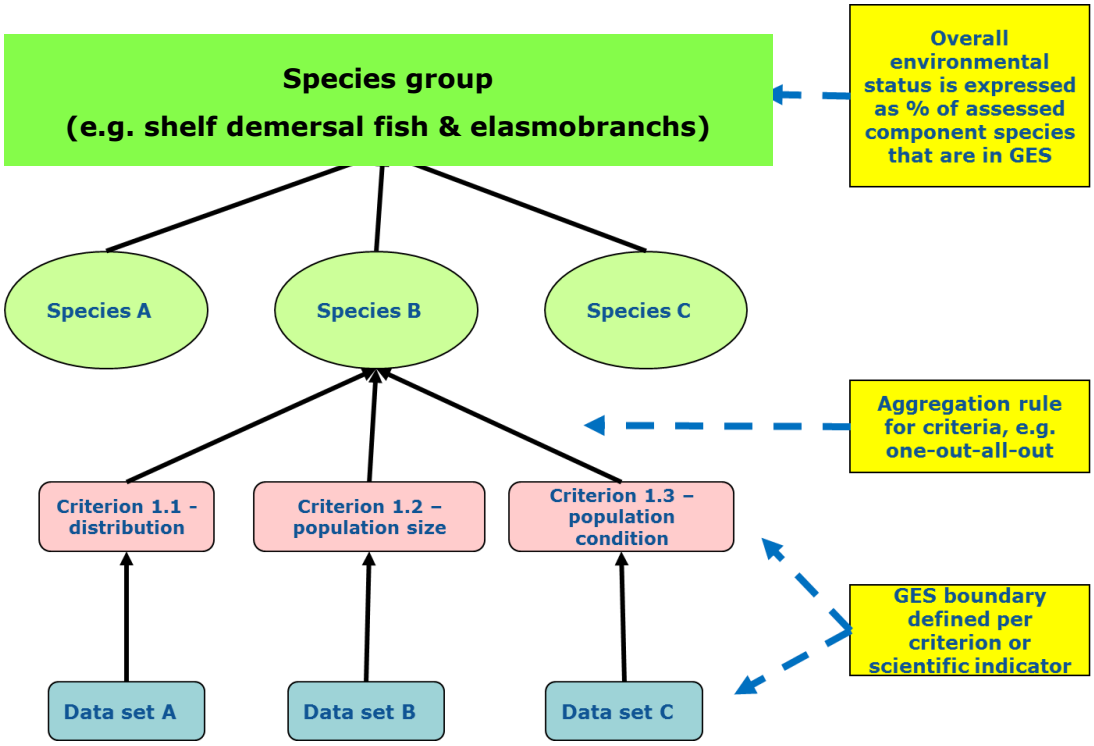

Figure 2. An example of how the assessment of a species group could be undertaken. For each one all releveant criteria and indicators have been applied (light red rectungulars) and aggregated accordingly.

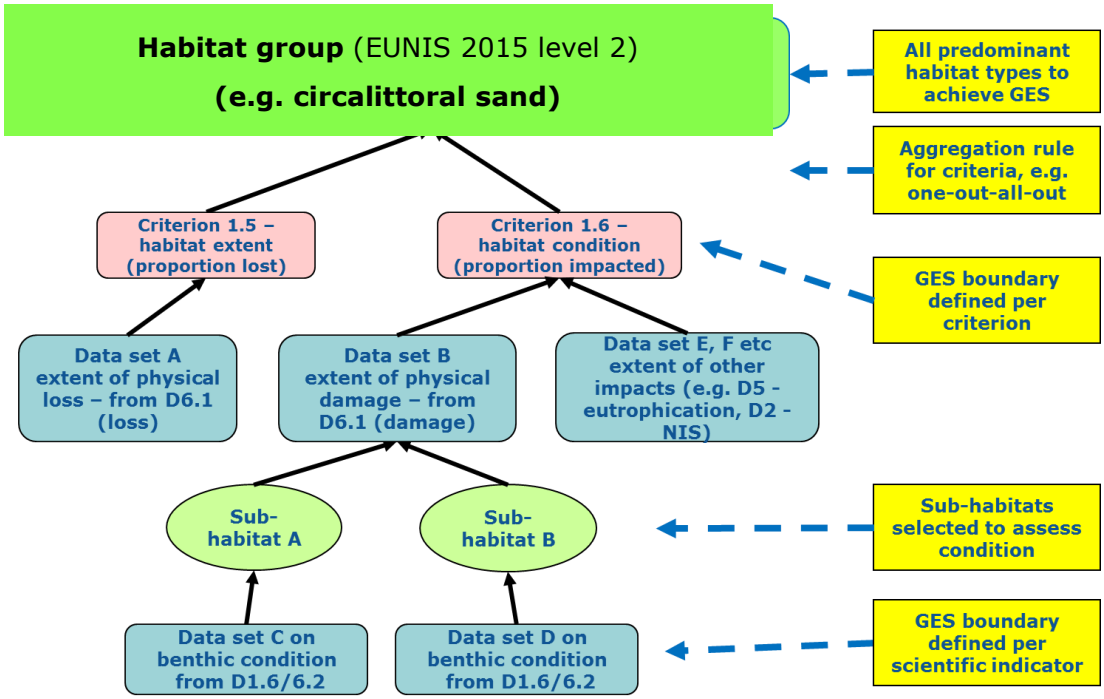

Figure 3. Assessment of an habitat group from the aggregation of representative habitats (EUNIS level 4/5) selected by the criteria in paragraph 2.3. For each one, all relevant criteria and indicators have been applied (light red rectungulars) and aggregated accordingly. Pressure descriptors' assessments feed the habitat assessments in terms of evaluating the anthropogenic impacts into the habitat physical aspects.

5.2 Final GES integration across descriptors assessments

The revised Commission Decision will probably be laid out in a different structure not driven by artificial descriptors boxes but the ecosystem components (species and habitats groups interpreted and translated into an 'ecosystem architecture'; Fig. 4), i.e. with indicators and criteria used in relation to ecosystem components and marine regions (and its subdivisions). This is expected to facilitate Member States understanding the rational for integration of assessments to inform on GES.

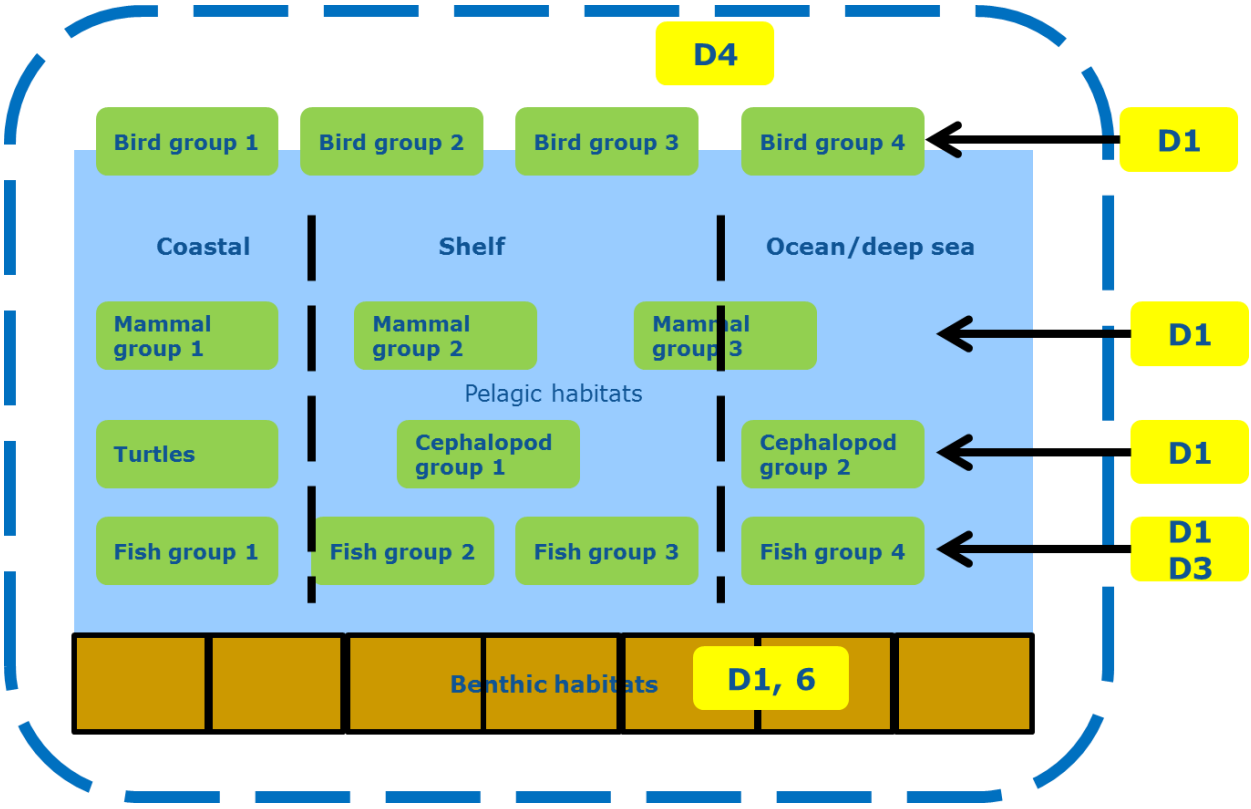

Figure 4. A pictorial version of the relationships between D1 and other descriptors were further defined, particularly for D3, D4 and D6 where the overall assessments correspond to the ecosystem-based approach for GES determination and assessment (blue dashed line).

The expert group welcomed this approach highlighting the need to use outcomes of pressure assessments (particularly physical loss and damage, eutrophication and NIS for benthic habitats) into the overall ecosystem assessment. This conceptual approach can be practically implemented as shown in Table 6, where the pressure-impact-state links are included. It was noted that all indicators are not yet available for all impact assessments; where such impacts are considered important for the assessment of a habitat type, it is advisable to develop in priority those appropriate indicators. Where the impacts are considered minor or negligible, use of expert judgement may be an alternative.

Table 5. Illustrative example assessment of a species for a specified assessment scale and area (e.g. a sub-division of a subregion), showing the assessment criteria and threshold (GES boundary) values for each (theoreticalvalues given for illustration only). Each criterion is assessed using scientific indicators (e.g. defined at regional or national level) which provide data on the extent of impact for particular pressures. The overall assessment per criterion is the cumulative impact against the threshold (GES boundary) value; the overall assessment of the species has used the one-out-all-out method at criterion level.

	State criterion	Threshold	Pressures		Impact/source of pressure	Assessment values	Criterion assessment	Overall
Listed species: Seal (e.g. *Monachus monachus*)	Species distribution (1.1, 1.1.1, 1.1.2)	<[10]% loss of range, or <[25]% loss of area occupied within range	Energy	Input of sound	Exclusion from areas	15%	GES (17% loss of area occupied)	GES
			Biological	Visual disturbance	Exclusion from areas by ecotourism & other human activities	2%		
	Population size (1.2, 1.2.1)	<[50]% change vs reference level	Biological	Removal of species (targeted, non-targeted)	By-catch (3.1)	5%	GES	
			Biological	Injury/death to species	Hunting			
	Population condition (1.3, 1.3.1)	Significant reduction in fecundity/ survival/ reproductive rates; significant change in age/size structure of population	Chemicals and other pollutants	Input of contaminants (synthetic substances, non-synthetic substances, radionuclides) - diffuse sources, point sources, acute events	Bioaccumulation (8.2, 8.2.1)	Not assessed	???	
	Habitat for species; Species distribution (1.1, 1.1.1, 1.1.2)	<[30]% loss/damage vs reference condition	Physical	Alteration of benthic or pelagic habitats morphology	Loss of haul-out sites	20%	GES	

6. Steps forward and technical needs for D1

Aggregation rules: Further work is needed to technically support the higher level components assessment i.e. aggregation rules for species groups. It was acknowledge that the way forward to select aggregation rules should include some testing of the available and most adequate options with real data; analysing the implications, advantages and disadvantages of each method. It was also mentioned that recent scientific literature and R&D projects have provided a huge amount of guidance on this topic, and that other related works are in progress (e.g. EcApRHA[9] project).

Habitat group assessments: Further consideration is needed on the inclusion of special (listed) habitats for the MSFD and how we can take stock of the HD, WFD and RSCs assessments. In addition, it has to be clarified whether habitat elements and special habitats could be merged or split at the habitat group level assessment. The following views are arguing for this issue:

- By doing an assessment of special and "'non-special" habitats separately we are getting a complete picture of our benthic environment.
- Special habitats are a sub-feature of MSFD habitats groups, so by doing an assessment of MSFD habitats groups only, including special habitats where relevant, you get a complete picture of our benthic environment.

More working examples are needed to be developed, based on Table 6, to facilitate the implementation of an integrated assessment for the biodiversity elements, including also the revised criteria and indicators for all MSFD descriptors.

[9] EcApRHA: Ecosystem Approach to (sub) Regional Habitat Assessments: EMFF EC funded project

Annex I: Agenda of the workshop

Day 1 – Monday 7th September		***Background doc***
13:30	Opening of the meeting by JRC, ENV/adoption of the agenda	
	Introduction: Scope and objectives of the workshop	
13:50	Issue 2 -introduction	BD_i2_lists_elements
14:00	Issue 2-***PARALLEL SESSIONS*** (a) Species; (b) Habitats	
15:30	***COFFEE BREAK***	
16:00	Issue 2 (Cont.)	
17:30	**Plenary** – wrap up of first day	
18:00	***CLOSURE OF DAY 1***	

Day 2 – Tuesday 8th September		
09:00	Issue 3	BD_i3_EUlegislation
10:30	***COFFEE BREAK***	
11:00	Issue 3 (cont.)	
12:30	***LUNCH BREAK***	
14:00	Issue 4	
15:30	***COFFEE BREAK***	
16:00	Issue 4 (cont.)	BD_i4_crossC
17:30	***CLOSURE OF DAY 2***	

Day 3 –	***Wednesday 9th September***	
09:00	Issue 4 (cont.)	
10:30	***COFFEE BREAK***	
11:00	Issue 5	BD_i5_criterion17
12:30	***LUNCH BREAK***	
14:00	AOB	
15:30	***COFFEE BREAK***	
16:00	Conclusions and steps forward	
17:00	***END OF THE WORKSHOP***	

Annex II: List of participants (experts & stakeholders)

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