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Guidance for analysis of sensitivity to pressures of water dependent habitats & species listed in the Habitats and Birds Directives (Milestone)

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Context:

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1 Background

1.1 Task Description

- In support of work on streamlining reporting under the Nature Directives, the water and marine related Directives (links to task 1.7.1.A), Ecologic was asked to prepare an analysis of sensitivity to various pressures of 'water-dependent ' habitats and species listed respectively in Annexes I and II of the Habitats Directive and I of the, Birds Directive.
- The work was to make use of information published in the 2008 Irish report on "Water Framework Directive, Annex IV Protected areas: water dependent habitats and species and high status sites", as well as previous work done by Ecologic Institute on making better use of data on pressures and threats reported by Member States under Article 12 (Birds Directive) and Article 17 (Habitats Directive).
- More specifically, taking as an example work done in Ireland (Mayes 2008), Ecologic Institute was asked to prepare a document which **lists Annex I habitats and Annex II species of the habitats Directive which are water-dependent** and present them in a table such as tables 5.1 and 5.3 of this publication with the aim of supporting efforts to prepare criteria for selecting sites that are water dependent. This work was to:
    - 1) Refine the data set on water dependent habitats and species
    - 2) Look at the pressure side, linking the work to that done under Task 171A
    - 3) Look at the work done under the ETC-ICM and see if there are overlaps
- This work is in support of ETCBD efforts towards preparing assessment products in support of the EU Biodiversity Strategy to 2020, the CBD Strategic plan, and the 7th EAP under Task 1.7.5.A.

1.2 2013 Analysis by AOPK

- Under the WFD, MS are requested to make an inventory of water dependent protected areas (mostly Natura 2000 sites - Article 6 and Annex IV[1]). These provide a reference list of water dependent Natura 2000 sites. Protected areas included into the WFD Register (referred to as 'registered sites') are to be taken into account when the environmental objectives are to be set. The WFD also asks Member States for regular update of the WFD Register information.
- Although there are guidelines on how to qualify water-dependent sites, we know, by experience from the last reporting round, that responses by countries are very heterogeneous and there were discrepancies' on further analysis. A report was prepared in 2013 by the ETCBD partner AOPK to test whether all relevant protected areas had been included by MS. To do so, the AOPK compared the area of Natura 2000 sites that should theoretically be expected to be reported based on a **reference list of water dependent habitats and species linked to 4 broad ecological groups** (Marine, Coastal, Wetlands, Rivers&Lakes) **and birds linked to 3 ecological groups** (Marine, Coastal, Wetlands), with the area of the protected

[1] Article 6 of the Water Framework Directive 2000/60/EC requires that "Member States shall ensure the establishment of a register or registers of all areas lying within each river basin district which have been designated as requiring special protection under specific community legislation for the protection of their surface water and ground water or for the conservation of habitats and species directly depending on water."
Annex IV of the Water Framework Directive defines protected areas for the conservation of habitats and species as follows:
1. (v) areas designated for the protection of habitats or species where the maintenance or improvement of the status of water is an important factor in their protection, including relevant Natura 2000 sites designated under Directive 92/43/EEC and Directive 79/409/EEC.

areas reported by Member States in RBMPs as being considered in management planning in accordance with WFD requirements.

- This study concluded that the approach of using a theoretical reference dataset of water-dependent Natura 2000 sites based on the identification of water dependent habitats and species under the Habitats Directive and bird species is suitable for broadly assessing the state of the WFD Register in relation to requirements concerning protected areas designated under the Nature Directives.
- At the same time, however, the study finds that Natura 2000 sites reported by MS under the WFD Register of protected areas have been selected quite differently between MS and no specific explanation is given on the approach taken to qualify water-dependent sites. Moreover, while the relation of species/habitats to broad ecological groups has been done according to the best scientific knowledge (best available information), not all the species/habitats linked to certain broad ecological groups are necessarily water dependent.
- In 2017, the ETC-BD aims to redo this analysis using new data reported by MS under the WFD. For this analysis a new "Reference European database" including Natura 2000 sites will need to be selected on the basis of their water dependency.
- Accordingly, the **ETC-BD believes that a closer assessment of the link of respective habitat/species to water-dependent ecosystems should be done and guidance describing "water dependency" should be provided in order to harmonize methodological approaches in MS**.

2 Guidance Table on Water Dependent Habitats & Species

2.1 What was done for the analysis in Ireland?

- In December 2008, Ireland released a report titled "Water Framework Directive Annex IV Protected Areas: Water Dependent Habitats and Species and High Status Sites" developed by an ecological consultant. The purpose of this guidance was to provide information on water dependent habitats and species that are of nature conservation importance, and on their occurrence in Protected Areas in Ireland.
- 62 European natural habitat types listed in Annex 1 of the Habitats Directive occur in Ireland. Forty four were defined as water dependent by Ó Riain (2005) and all of them were listed as qualifying interests within the Natura 2000 SAC network in Ireland. Of the 423 SAC and cSAC sites listed in Ireland, 367 had at least one water dependent Annex 1 listed habitat or Annex 2 listed species listed as a Qualifying Interest.
- Five primary sources/types of water were identified by Ó'Riain *et al* as applying to water dependent habitats:
    - c - coastal waters
    - t – transitional waters
    - s - surface waters (excluding transitional and coastal waters)
    - g - groundwater
    - p - precipitation
- Habitats were placed into broad groupings based on the source type of water dependency. They identify six groupings of Habitats Directive Annex 1 listed water dependent habitats:
    - Coastal marine habitats
    - Coastal transitional and intertidal habitats
    - Coastal onshore habitats
    - Surface water dependent habitats
    - Groundwater dependent habitats
    - Precipitation dependent habitats
- Section 5 considers the sensitivity of Habitats Directive Annex 1 and 2 listed water dependent habitats and species to water status management issues that arise under the Water Framework Directive. The guidance is referred to as an interim approach addressing the general sensitivities of water dependent habitats and species to direct impacts, hydrological impacts, and water pollution until more spatial information is available.
- Tables included in this Section indicate the relative sensitivities of habitats (Table 5.1) and species (Table 5.3) to hydrological impacts and water pollution aspects of water status, based on best expert opinion.
- The tables include comments on issues that should be considered by agencies involved in implementing the Water Framework Directive, when considering existing pressures and risk assessments, and preparing and implementing River Basin Management Plans. They provide some additional, more specific information.
- The habitats table identifies the type of water dependency of the habitat, referring to whether the habitat receives water from or is otherwise supported by **surface water (SW)**, **marine**

water (MW) or **groundwater (GW)**. The table also identifies hydrological and water pollution pressures likely to impact on each habitat, and for which measures may be required under the WFD. The likely sources or drivers are also indicated.

- The species table also identifies the type of water dependency and provides a less detailed classification of whether the species is sensitive to "direct impacts", "hydrological impacts, and "water pollution", based on the sensitivity categories, low, medium or high. Furthermore, there is an "Impact Potential" column indicating the likely impact given the sensitivity of the receptor and nature of the pathway.

2.2 Assessment of Data on Pressures Reported under the WFD

- As one starting point, Ecologic Institute was asked to assess the potential use of WFD data reported under River Basin Management Plans (RBMPs) in order to help inform the guidance table. In particular, it was asked that Ecologic Institute re-assess the results of a previous ETC-ICM Crosswalking exercise (Lyche et al. 2015)[2].
- As part of the ETC-ICM Crosswalking exercise in 2014 (Link) WFD ecological status and pressures of water bodies reported by Member States with their 1st RBMPs in the period 2010- 2011 have been aggregated to broad types based on the similarity of national types. Natural and heavily modified (HMWBs) and artificial water bodies (AWBs) were merged for this analysis, due to the intention to provide a simple overview of type-specific differences of all water bodies.
- Many national WFD types have high similarity and may be aggregated into 20 broad river types and 15 broad lake types based on altitude, size and geology (and mean depth for lakes). There is a reasonable match between these WFD broad types, the WFD Intercalibration common types and the HD freshwater habitat types, as well as EUNIS types for both rivers and lakes, with the exception of two very wide HD river habitats, the HD type 3260 rivers from plain to montane levels, and 3210 Fennoscandian rivers, as well as some very narrow HD and EUNIS types.
- However, there is one important limitation: The 20 broad river types include 575 national types and about 87% of river water bodies in Europe; 15 broad lake types include about 290 national types and 73% of lake water bodies in Europe (LINK). In other words the broad types don't cover 100 % of all water bodies.
- Another result of the ETC-ICM document was that the differences between WFD ecological status and pressures of rivers and lakes aggregated into the HD biogeographic regions show that water bodies in the Alpine and Boreal areas of Europe are in better status.
- Assessments of freshwater status and pressures reported under the WFD are mostly consistent with assessments of conservation status and threats reported under the Habitats Directive for WFD types that are comparable to HD freshwater habitats. Inconsistencies and mismatches are due to non-comparable types/habitats and/or to non-comparable assessment systems.
- As part of the ongoing ETC-BD work Ecologic Institute went one step further and analyzed how useful the broad type approach is to link WFD pressure data for specific HD habitats on MS level. This analysis goes beyond the cross-walking exercise that looked only at all HD water habitats at the same time (Rivers and Lakes levels). We choose the example of Germany. A summary of this analysis can be found in the Annex.

Conclusions:

- While the data reported under the WFD and the HD is consistent in many areas, a number of issues limit the usefulness of an analysis based on a comparison of the reported data. **As a**

[2] ETC-ICM Technical Report 2/2015

result, it was decided that the previous WFD reporting data should not be used to help inform the guidance document. One of the key issues identified is the inability to link all water bodies under the WFD to habit**at** types, and the different criteria for reporting pressures.

- Another difficulty in comparing WFD and HD data comes from differences in criteria for reporting pressures. According to WFD reporting guidelines: "A pressure or impact should only be reported if it is significant, alone or in combination with others, because it puts the Environmental Objectives at risk." Under the HD, on the other hand, MS report all activities impacting a species/habitat during the reporting period (HD-Pressure) or expected to impact it in the next reporting period (HD-Threat) and a separate assessment is made as to its relative importance by ranking it. As such, it is difficult at times to know whether a WFD pressure should be considered a pressure or threat in terms of the HD definition, and at what ranking level.
    - **Recommendation:** If data under the next reporting cycle is assessed this point should be further reviewed.
- The aggregated form of WFD data (Level 1) is not particularly useful for comparison with HD data. The WFD reported data as is currently publicly available is much less detailed than the data we have under the HD. Data collected in the 2nd reporting cycle will be more detailed (hopefully including data at Level 2). At the same time, it is not entirely evident why the more detailed WFD reported data from the previous round is not publicly available, as is the case for Article 12 and Article 17 data.
    - **Recommendation:** the EEA must ensure that all WFD data on pressures is made publicly available at all reporting levels.
    - **Recommendation:** Level 2 data and data reported on drivers of pressures should be assessed when the new data is available.
- While a comparison of water pollution pressures and hydro-morphological pressures between reporting streams is relatively straight forward (despite the before mentioned caveats), all 'other' types of WFD and HD pressures are difficult to compare and add little additional useful analysis. As such, a comparison of WFD and HD data for 'other' types of pressures should focus mainly on the categories H and J of the Article 17 P&T list.

2.3 Assessment of Water Dependent Species

2.3.1 Assessment of MAES reference dataset

- As a first step to creating a table with information for water dependent habitats and species in one synthesis table in an easily accessible way, Ecologic Institute prepared an overview of water dependent habitats and species.
- As a starting point for the assessment, Ecologic Institute used an existing reference dataset developed by the EEA-ETC/BD aimed at establishing a list where all habitats and species covered by the Birds and Habitats Directives are allocated to ecosystem types as defined by the MAES ('Mapping and Assessment of Ecosystems and their Services') typology. This work built on preliminary work done by the ETC/BD in 2010 in preparation for the biodiversity baseline report.
- This allocation of species and habitat per ecosystem was done for each of the nine terrestrial biogeographic regions (according to the Habitats Directive) and each marine region (according to the Marine Strategic Framework Directive).
- The three major ecosystem types are terrestrial, freshwater, and marine ecosystems (see Table 1).

Table 1: Classification of ecosystems (based on MAES - Mapping and Assessment of Ecosystems and their Services)[3]

Terrestrial ecosystems	Cropland, Grassland, Woodland and forest, Wetlands, Heathland and shrub, Sparsely or unvegetated land, Urban
Freshwater ecosystems	Rivers and lakes
Marine ecosystems	Marine inlets and transitional waters, Coastal Areas, The Shelf, Open Ocean

Source: European Commission, April 2013

- While linking habitat types to broad ecosystems is rather straightforward, it is more complex for species, as some of them use different ecosystems during their life cycle. In addition, their ecological requirements may differ depending on the biogeographical context.
- The allocation of each species and habitat to a specific biogeographical or marine region is based on the information extracted from the Natura 2000 database and from the Article 17 database from the first reporting round (2001-2006). For some species, the allocation to a given biogeographical or marine region was made by ETC/BD experts;
- The characteristics of the links between species and main ecosystem – Preferred, Suitable, or Occasional – are detailed for each species as follows:
    - **Preferred ecosystem**: which is the most important for the species; the species usually uses this ecosystem during most of its life cycle or its largest population is linked to it
    - **Suitable ecosystem:** where the species regularly occurs, but it is not the preferred one
    - **O occasional ecosystem**: where the species lives sometimes, but only marginally or a small part of the species population uses this ecosystem;
- The following rules were applied:

[3] See EC 2013

- A terrestrial or freshwater species can have a maximum of TWO preferred ecosystems (P)
- A marine species can have a maximum of THREE preferred ecosystems (P)
- All non-avian species can have several suitable ecosystems (S) and occasional ecosystems (O)
- An anadromous species can be listed in a terrestrial biogeographical region and in a marine region as well. But for the biogeographical region, the species will be only linked to "Lakes and Rivers" ecosystem
- A marine ecosystem can only be allocated to a species listed in a marine region
- Each habitat type will be attributed to only ONE preferred ecosystem. The allocation of marine habitats to the MAES typology is based on a previous ETC/BD work (Evans et al., 2013). Details about the MAES marine ecosystem typology are available on page 4 below.

Table 2 below provides an overview of the number of birds, non-bird species and habitats linked to each particular ecosystem based on the Birds and Habitats Directives.

Table 2: Number of Article 12 Annex birds and Article 17 annex non-bird species and habitats per ecosystem

MAES ecosystem type	Birds	Non-bird species	Habitats
Cropland	86	77	
Grassland	79	400	45
Woodland and forest	171	330	81
Wetlands	140	284	14
Sparsely or unvegetated land	185	498	26
Heathland and shrub	110	326	38
Urban	52	45	
Rivers and lakes	144	333	19
Marine inlets and transitional waters	51	37	13
Coastal Areas	41	41	8
The Shelf	16	42	3
Open Ocean	8	35	2

Note: No Annex 1 habitats have been linked to the cropland and urban ecosystems

- Based on the Irish Guidance Document and the previous AOPK analysis **4 MAES categories** were selected for further analysis (Wetlands, Rivers & Lakes, Marine inlets & Transitional Waters, Coastal Areas, Shelf, and Open Ocean).
- An overview of these MAES categories can be found in the Annex.

2.3.2 CIS Definition of Water Dependent Habitats & Species

- In a second step, Ecologic Institute aimed at providing a classification of water dependent habitats and species that went beyond the MAES categorisation.
- The Water Framework Directive requires that a Register of Protected Areas must list those sites designated under European legislation that contain water dependent habitats or species. The Directive does not provide definitions of water dependency itself, but within Common

Implementation Strategy document no. 12 (CIS 2003) a common definition is formulated. This definition was used for this analysis.

Table 3: Ecological criteria for identifying Natura Habitats and Species that are directly dependent on the status of water

Natura 2000 SPECIES	Natura 2000 HABITATS
1.a Aquatic species living in surface waters as defined in Article 2 of the WFD (e.g. bottle-nose dolphin, freshwater pearl mussel)	2.a Habitats which consist of surface water or occur entirely within surface water, as defined in Art. 2 of the WFD (e.g. oligotrophic waters; estuaries; eelgrass beds)
1.b Species with at least one aquatic life stage dependent on surface water (i.e. breeding; incubation, juvenile development; sexual maturation, feeding or roosting - including many Natura bird and invertebrate species)	2.b Habitats which depend on frequent inundation, or on the level of groundwater (e.g. alluvial alder wood, blanket bog, fens)
1.c Species that rely on the non-aquatic but water-dependent habitats relevant under 2.b and 2.c in the HABITATS column of this Table (e.g. Killarney fern)	2.c Non-aquatic habitats which depend on the influence of surface water - e.g. spray, humidity (bryophyte-rich gorges) should be considered

- Based on the CIS definition, an assessment was made for each HD listed habitat and a selection of Rivers & Lakes ecosystem species as to their water dependency.
- A more detailed differentiation as provided by Ó'Riain et al is not needed, when using the CIS definition. In this classification only one out of three criteria (1a/b; 2a/b; 3a/b) in the respective column needs to be fulfilled. It is important to notice that this classification only gives a general indication. There might be cases, were a sub-type of a habitat is not water dependent, whereas most other sub-types of the same habitat type are.
- In the column section marked CIS, an assessment is provided for each habitat or species indicating whether the habitat or species receives water from or is otherwise supported by surface water (SW), marine water (MW) or groundwater (GW). If a classification is unclear the assigned value was marked with brackets (e.g (GW)).
- In addition, information on precipitation dependent (ombrotropic) habitats is given. In this category, including wet heath and raised bog habitats, habitats are also to a certain extent supported by groundwater or include ground water dependent habitats and species.
- The assessment is based, wherever possible, on Mayes (2008) in the first place. However, in some cases the categorization from this author had to be revised. Missing habitats and most species are amended via expert judgment, and additional scientific literature. The following additional literature was used:

Habitats

- HELCOM (2013): Red List of biotopes . Red List Biotope Expert Group, www. helcom.fi
- DG ENV (2008): MANAGEMENT of Natura 2000 habitats factsheets, http://ec.europa.eu/environment/nature/natura2000/management/habitats/models_en.htm

Species:

- *www.iucnredlist.org/*

2.3.3 Comparison of Reference Dataset with Own Assessment

Habitats

- In a next step, we compared the habitats found in the 4 WFD related MAES ecosystem categories in the reference dataset with our own assessment of water dependent habitats based on the CIS definition.

- This assessment revealed that a number of habitats were found that can be considered water dependent based on the CIS definition that are not, however, classified as belonging to one of the 4 MAES ecosystem categories selected. At the same time, no habitats classified as belonging to the 4 MAES ecosystem categories selected were not considered water dependent based on the CIS definition.
- A complete overview of the habitats identified as not falling within the MAES categories can be seen below.

Table 4: Overview of the habitats identified as water dependent and not falling within the relevant MAES categories

HD Code	HD Name	Habitat Group	MAES Category	CIS Definition		
				2a	2b	2c
1210	Annual vegetation of drift lines	Coastal habitats	Sparsely vegetated land	MW		
1220	Perennial vegetation of stony banks	Coastal habitats	Sparsely vegetated land		MW	
1230	Vegetated sea cliffs of the Atlantic and Baltic Coasts	Coastal habitats	Sparsely vegetated land			MW
1240	Vegetated sea cliffs of the Mediterranean coasts with endemic Limonium spp.	Coastal habitats	Sparsely vegetated land			MW
1250	Vegetated sea cliffs with endemic flora of the Macaronesian coasts	Coastal habitats	Sparsely vegetated land			MW
1340	Inland salt meadows	Coastal habitats	Grassland		GW	
1410	Mediterranean salt meadows (Juncetalia maritimi)	Coastal habitats	Grassland; Sparsely vegetated land		MW, GW	
1420	Mediterranean and thermo-Atlantic halophilous scrubs (Sarcocornetea fruticosi)	Coastal habitats	Heathland and shrub			MW
1510	Mediterranean salt steppes (Limonietalia)	Coastal habitats	Grassland			MW
1530	Pannonic salt steppes and salt marshes	Coastal habitats	Grassland		SW, GW	
1610	Baltic esker islands with sandy, rocky and shingle beach vegetation and sublittoral vegetation	Coastal habitats	Sparsely vegetated land	MW, GW	MW, GW	
1620	Boreal Baltic islets and small islands	Coastal habitats	Sparsely vegetated land	MW, GW	MW, GW	
1640	Boreal Baltic sandy beaches with perennial vegetation	Coastal habitats	Sparsely vegetated land		MW, GW	
2110	Embryonic shifting dunes	Dunes habitats	Sparsely vegetated land		MW	
2120	Shifting dunes along the shoreline with Ammophila arenaria ('white dunes')	Dunes habitats	Grassland; Sparsely vegetated land		MW	
2130	Fixed coastal dunes with herbaceous vegetation ("grey dunes')	Dunes habitats	Grassland			(MW)
2140	Decalcified fixed dunes with Empetrum nigrum	Dunes habitats	Heathland and shrub			(MW)
2150	Atlantic decalcified fixed dunes (Calluno-Ulicetea)	Dunes habitats	Heathland and shrub			(MW)
2160	Dunes with Hippophaë rhamnoides	Dunes habitats	Heathland and shrub			(MW)

21A0	Machairs (* in Ireland)	Dunes habitats	Grassland		GW, MW, SW	
4010	Northern Atlantic wet heaths with Erica tetralix	Heath & scrub	Heathland and shrub		GW	
4020	Temperate Atlantic wet heaths with Erica ciliaris and Erica tetralix	Heath & scrub	Heathland and shrub		GW	
6410	Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)	Grasslands	Grassland		GW	
6430	Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels	Grasslands	Grassland		GW, SW	
6440	Alluvial meadows of river valleys of the Cnidion dubii	Grasslands	Grassland		GW, SW	
6450	Northern boreal alluvial meadows	Grasslands	Grassland		GW, SW	
6460	Peat grasslands of Troodos	Grasslands	Grassland		GW	
8310	Caves not open to the public	Rocky habitats	Sparserly vegetated land			GW
8340	Permanent glaciers	Rocky habitats	Sparserly vegetated land	SW		
91D0	Bog woodland	Forests	Woodland and forest		GW	
91E0	Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)	Forests	Woodland and forest		GW, SW	
91F0	Riparian mixed forests of Quercus robur, Ulmus laevis and Ulmus minor, Fraxinus excelsior or Fraxinus angustifolia, along the great rivers (Ulmenion minoris)	Forests	Woodland and forest		GW, SW	
Total: 32				Total: 4	Total: 20	Total: 10

Species

So far the approach as for the habitats was tested for 10 common fish species and one other species from each taxonomic group. The focus was limited to the MAES category "Rivers and lakes" only.

Table 5: Classification of HD species according to water dependency using the CIS definition (extract)

							CIS Definition				MAES		
	HD Name	Taxonomic Group	Annex Priorit	Annex II	Annex IV	Annex V	Type	1a	1b	1c	Category	REG	Association Code
1095	Petromyzon marinus	Fish	N	Y-EXCP	N	N		SW, MW			Rivers and lakes	ATL, CON, MED, BOR	P - Preferred
1096	Lampetra planeri	Fish	N	Y-EXCP	N	N		SW			Rivers and lakes	ALP, ATL, BOR, CON, MED	P - Preferred

Conclusions:

Habitats

- All in all, the CIS definition can be successfully applied for all habitat types. However, the classification can only give an overall evaluation, since in some cases sub-types of habitats differ from the main habitat type (e.g. the habitat 2180 Wooded dunes of the Atlantic, Continental and Boreal region" includes both salt spray influenced and not salt spray influenced sub-types)
- The MAES classification ("Wetlands"; "Coastal"; "Marine inlets and transitional waters", "Rivers and lakes", "Open ocean", and "Shelf") cannot deliver a full overview of water dependent habitats. Especially the MAES habitat groups "dunes", "Heathland and shrubs", "Sparserly vegetated land" contain further water dependent habitats.

Species

- First results indicate that the CIS definition of water dependent species can be successfully applied for species as well. By analogy with the habitats results , it can be assumed that the MAES classification ("Wetlands"; "Coastal"; "Marine inlets and transitional waters", "Rivers and lakes", "Open ocean", and "Shelf") cannot deliver a full overview of water dependent species. By applying the CIS definition a more comprehensive list of water dependent species can be expected.

2.4 Sensitivity of water-dependent habitats & species

- In the original Irish guidance document the sensitivity of habitats/species was understood as existing pressures as well to potential future developments. Furthermore, the pressures likely to impact on each habitat, and for which measures may be required under the WFD, are listed. Pressures under the habitats table are generally reported in 1- 2 broad categories. The driver is only referred to as a *likely driver*, leaving some flexibility in interpreting data.

- For the assessment for this task, the general sensitivities of water dependent habitats and species to hydrological impacts, water pollution, and direct impacts (only for species), were evaluated based on a combination of the resistance of a habitat/species to the pressure category and its ability to recover from environmental stress or damage.

- The sensitivity of a species or habitat was determined by the autecological optimum of that species/habitat. This autecological optimum defines the physiologically optimal existence range to abiotic environmental factors. For the sake of practicality it is assumed that all species and habitats have the same autecological optimum in the different biogeographically regions. This simplification is permissible given the pan-European perspective of this analysis.

- The sensitivity of the habitats (receptor sensitivity) to these pressures is listed as low, medium or high. If a classification was not expedient, this is stated as "N/A" in the list. Theoretically, it would be even possible to further specify the pressures according to ones listed in the Pressures and Threats database (e.g. hydrological pressures into 2D03 - Shipping lanes and ports2 and "J02 Changes in water bodies conditions"). This would allow for a more detailed analysis, but would also make the table overly complex.

- For the habitats other pressures stemming from the Pressures and Threats database the such as invasive species (I01), fishing & harvesting (F02), and direct impact (G05/G01/D01/G02/E01/C01) are marked without giving a sensitivity evaluation. If a classification or evaluation is unclear this was marked with a question mark (e.g "?", "M?")

- The assessment is based, wherever possible, on Mayes (2008) in the first place. However, in some cases the categorization from this author had to be revised. Missing habitats and most species are amended via expert judgment, and with help of additional literature. The following additional literature was used:

Habitats

- HELCOM (2013): Red List of biotopes. Red List Biotope Expert Group, www. helcom.fi
- DG ENV (2008): MANAGEMENT of Natura 2000 habitats factsheets, http://ec.europa.eu/environment/nature/natura2000/management/habitats/models_en.htm

Species:

- www.iucnredlist.org/
- http://www.pivi.de (fishes only)
- The taxa and autecology database for freshwater organisms, http://www.freshwaterecology.info/

2.5 Article 17 Reporting Data on Pressures & threats

Pressures & Threats Database

- In order to attempt to make better use of the data on pressures and threats (P&T) reported by Member State (MS) during Article 12 and 17 reporting under the Habitats Directive, a new database was created by Ecologic Institute in 2015 and 2016 under Task 175A.
- After initial analysis of the reported data, it was decided to focus data collection for the database on pressures and threats
    - Ranked as of being of "high importance", and
    - Reported by several MS.
- This decision was taken due to the different reporting practices of the MS and the nature of the methodology used to collect P&T, which limits reporting of high-ranked P&T to 5. This decision allows for the analysis to focus on those P&T, which:
    - Are recognized by the MS as being of particular importance to the habitat in question;
    - Have been identified by several MS (>1) as being of high importance. It is important to note, that this does not necessarily indicate that the P&T is cross-border in nature, but does rule out that the P&T is specific to one MS[4].

[4] P&T reported by MS that are specific to one particular locality can still be assessed based on the raw reporting data. The results from this raw data were taken into account in the assessment of the impact potential for habitats and species.

- To ensure robust results for habitats, species and birds found in a large number of MS, a minimum threshold was set for the number of MS from the checklists that needed to report P&T to be counted. This threshold was (arbitrarily) set at 25% of the MS, but was implemented in such a way that it can be subsequently raised or lowered. Moreover, while MS had the opportunity to report at Level 3 and Level 4 during the reporting process, the data was prepared so that each P&T reported was counted at Level 2 and no more than once. Focusing on Level 2 allows for a harmonization of the reported data, as well as a broader assessment of pressures or threats.
- While it may have advantages to look at Level 03 and Level 04 reporting data to find detailed examples of pressures and threats reported by MS, the differences in reporting by MS make it necessary to do the overall assessment at Level 02 as, among other things, several key MS are only reporting at Level 02. This makes Level 02 the only consistent level at which we can compare data reported by MS at the European level. At the MS level, more detailed reporting can be helpful.
- Certain weaknesses to the existing methodology have been identified. In particular, certain habitats, species, birds and even biogeographical regions are lost due to the methodology used. As the methodology only looks at P&T reported in several MS, all habitats only found in one MS for a biogeographical region are not covered. This also implies that certain biogeographical regions covering a limited number of MS are underrepresented, especially BLS, MAC, MBLS, MMAC. Furthermore, as the Steppic biogeographical region is only reported by one MS (Romania), no P&T are assessed for this biogeographical region at all.
- However, the methodology provides a robust framework for interpreting the heterogeneous data reported by Member States, by harmonizing data and focusing on those pressures and threats that are most commonly reported.
- As a result, the database results were used to help provide information on relevant pressures and threats for habitats and species included in the table. All hydraulic impact, water pollution and 'other' pressure & threat categories meeting the filter criteria set out in the database methodology were included in the table for both habitats and species. This database helps to identify habitats and species facing pressures & threats that are both high ranking in nature and faced/reported by multiple Member States within the same biogeographical region.
- For the assessment of pressures & threats data, the following association of Article 12/17 pressures & threats categories with the three impact categories in the Irish guidance document (hydraulic impacts, water pollution impact and 'other' impacts) was made:

Table 6: P&T categories linked to hydraulic and water pollution impacts

Level 2 P&T		Level 1 P&T	
Hydraulic Impacts			
D03	Shipping lanes and ports	D	Transportation and service corridors
J02	Changes in water bodies conditions	J	Natural System modifications
Water Pollution Impacts			
A08	Fertilisation in agriculture	A	Agriculture
B05	Use of fertilizers (forestry)	B	Sylviculture, forestry
E03	Discharges (household/industrial)	E	Urbanisation, residential and commercial development
H01	Pollution to surface waters	H	Pollution
H02	Pollution to groundwater	H	Pollution
H03	Pollution to marine waters	H	Pollution
H04[5]	Air pollution, air-borne pollutants	H	Pollution
H05	Soil pollution and solid waste (excl. discharges)	H	Pollution
H06	Excess energy (noise, light, heating, electromagnetic)	H	Pollution
H07	Other forms of pollution	H	Pollution
Other = Everything Else			

- For each pressure from the database listed in the table, the biogeographical regions for which this pressure was included in the database is mentioned. It should be noted that for species, the table at times includes pressures & threats reported for species in biogeographical regions that were not considered associated with the Rivers & Lakes ecosystem within the MAES reference database prepared by the ETC-BD.

Use of raw dataset

- The raw pressures & threats data reported by MS under Article 17 reporting can be used to complement the P&T database, as it allows for an assessment of P&T ranked by Member States as medium and low, as well as data reported at Levels 03 or 04 of the P&T categorisation, which provide greater specificity. As a result, an evaluation of the pressures & threats data was made for each habitat and species assessed for hydraulic impacts and water pollution impacts, largely based on the frequency with which the relevant pressure & threat categories were reported at high, medium and low level by Member States. In general, the following rules were used to make this assessment:

  - Where a relevant level of hydraulic impact or water pollution pressures were reported for a habitat or species, generally understood as more than 10% of high pressures or more than 10% of overall pressures & threats reported, this was marked.
  - Habitats and species for which the 10% threshold was not met were instead indicated as 'low relevance' or 'no P&T' depending on whether a small share of pressures & threats is reported or none at all.

[5] For a few select habitats, an expert judgement was made to exclude H04 'air pollution' under the water pollution impact category and list it under the category 'other' as the pathway through which this pressure category would act as a water pollution impact was not considered adequately strong.

- Where possible the raw data was also used to provide additional context on potential drivers of water pollution impacts reported in the pressures & threats database.

2.6 Impact potential for water dependent habitats & species

- In the original Irish guidance document, the **"Impact Potential" column** is understood as "an attempt to indicate the likely impact given the sensitivity of the receptor and nature of the pathway". For the assessment for this task Ecologic Institute made an expert judgement as to the "Impact Potential" facing each habitat and species assessed. The values 'High', 'Medium', and 'Low' and 'N/A' were used for this assessment.
- Ecologic Institute used the following datasets for the evaluation of the impact potential:
    - The results from the sensitivity analysis
    - The pressures & threats database
    - The raw pressures & threats data reported by Member States under Article 17 reporting.
    - The impact potential values reported in the Irish guidance document (where available)
- In general, the following rules were used to make this assessment:
    - Where a pressure & threat category from the pressure & threat database was reported, the 'impact potential' was generally considered 'High' unless other mitigating factors gave reason to change this assessment.
    - Where no pressure & threat category from the pressure & threat database was reported, but the Article 17 raw data indicated a relevant or low relevance level of pressures & threats reported, an expert judgement of the 'impact potential' was made based on the receptor sensitivity assessment, the Irish guidance document value (where available) and the frequency of relevant pressures & threats reported by MS.
    - Where no P&T for hydraulic impacts or water pollution impacts were reported, the impact potential was automatically defined as 'N/A'.

Conclusion

- Both an assessment of the receptor sensitivity and impact potential for water dependent habitats and species, as provided under the Irish guidance document, can be performed on European level. A methodology for the assessment of the sensitivity of water dependent habitats and species (Section 2.4) and the use of Article 17 reporting data on pressures & threats (Section 2.5) has been provided and tested for both habitats and a selection of species.
- The pressures & threats database provides a particularly useful tool to help to identify habitats and species that are reported as being under particular pressure across multiple MS, while the raw data from Article 17 reporting on pressures & threats can be used to provide additional context, especially for habitats and species that are not covered by the pressures & threats database.
- A comparison of the results from the EU assessment performed for this task and the Irish guidance document reveal that while they are generally in line, they also occasionally diverge. Reasons for these differences may include:
    - Incorrect assessment of receptor sensitivity or impact potential for the Irish Guidance Document or the EU assessment
    - Differences in methodology
    - Divergences in the sensitivity and impact potential on Irish and EU level

- Furthermore, the impact potential assessments (based largely on Article 17 data) are occasionally higher than the receptor sensitivity assessments (based on the autecological optimum of the habitat or species) would indicate as possible. As such, further assessment is needed to conclude whether these differences are generally due to improper assessment, differences in the source data, or geographically concentrated impacts that are not representative for the habitat or species as a whole.
- In a next step, the results of both receptor sensitivity and the impact potential assessments should be evaluated by external experts and complemented by a review of additional literature, in order to validate the conclusions.

3 CONCLUSIONS

3.1 Next Steps

- We recommend that the existing results of the analysis of water dependent habitats and species be validated and completed in 2017 before being used to support AOPK analysis. In a next step we suggest to do a quality control on the basis of scientific literature. This would include adding a "used literature" column and a "furthers comments" column for each water dependent habitat and species. Afterwards, the table could be validated by an expert panel. This expert panel could consist of ETC-BD staff in a first place,
- There is a large potential to use the WFD data reported in 2016. However, it will not be clear to what extent this data can be used until the final data and its quality has been reviewed. We recommend that this data be assessed in 2017 to evaluate whether further analysis would be worth pursing in 2018. When the first MS have delivered their WFD data, we would like to assess to what extent geodata in WISE can be used to assess the pressures and status of individual habitats and species. More specifically, the article 17 GIS data on habitats and species can be used to analyse ecological status, protected areas, pressures that are reported under the ongoing RBMP assessment. We recommend the assignment of ETC-BD resources for developing a methodology in 2017. It should be noted, however, that the performance of this task is subject to the access to and availability of the necessary data.
- Furthermore, when the new data from WISE are there we recommend developing a methodology for using the Level 2 data for analysis of individual habitats and species.

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Annex A: Summary of 2013 Analysis by AOPK

- The results of the overall assessment can be seen in the figures below. Each column represents the total area of Natura 2000 sites under each of the 4 (SCIs/SACs) and 3 (SPAs) ecological groups as calculated from the 'reference dataset on water-dependent Natura 2000 sites'. The blue part of the column represents the actual proportion of Natura 2000 sites which have been reported by MS as water-dependent in the WFD register. The last column represents sites identified as water dependent (with at least one feature dependent on water without distinguishing specific ecological group).
- The bigger the overlap existing between sites included into the WFD Register and sites listed in the reference dataset, the higher the level of linkage between the WFD and the Nature Directives in MS implementation. A lower level of overlap, on the other hand, could indicate a lower linkage, issues with data or differences in the sophistication of the approach used by a MS[6].
- In comparison with total area of water dependent Natura 2000 sites (reference dataset) there is a quite large spatial overlap (82 %) both for SCI/SAC sites and SPA sites[7]. The smallest area of water dependent sites was found to be related to marine habitats. The biggest area was identified with sites designated for wetland features.

Figure 1: Proportion of SCI/SAC Sites Included into the WFD Register

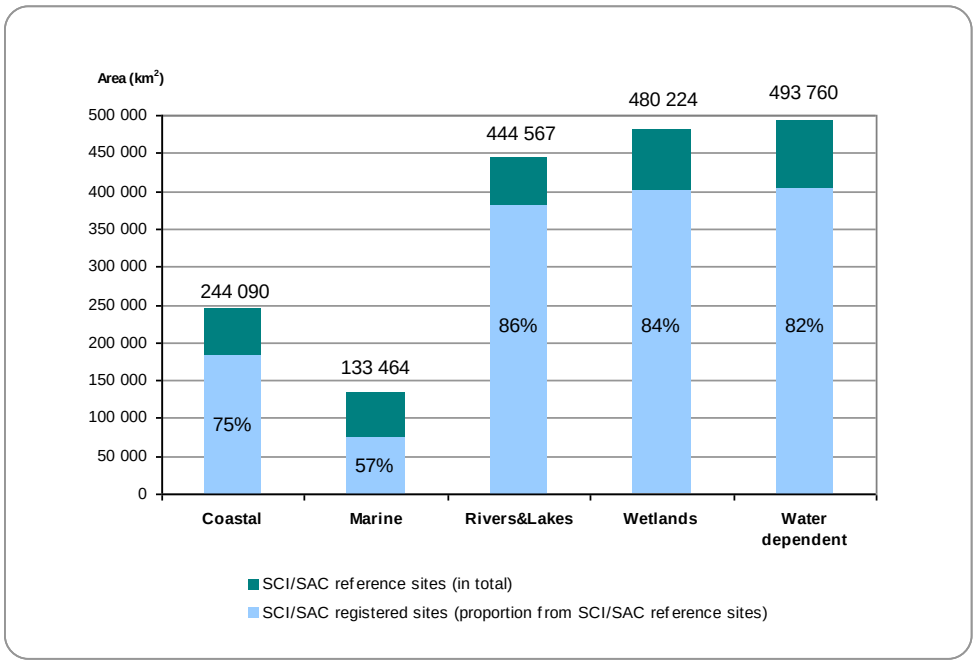
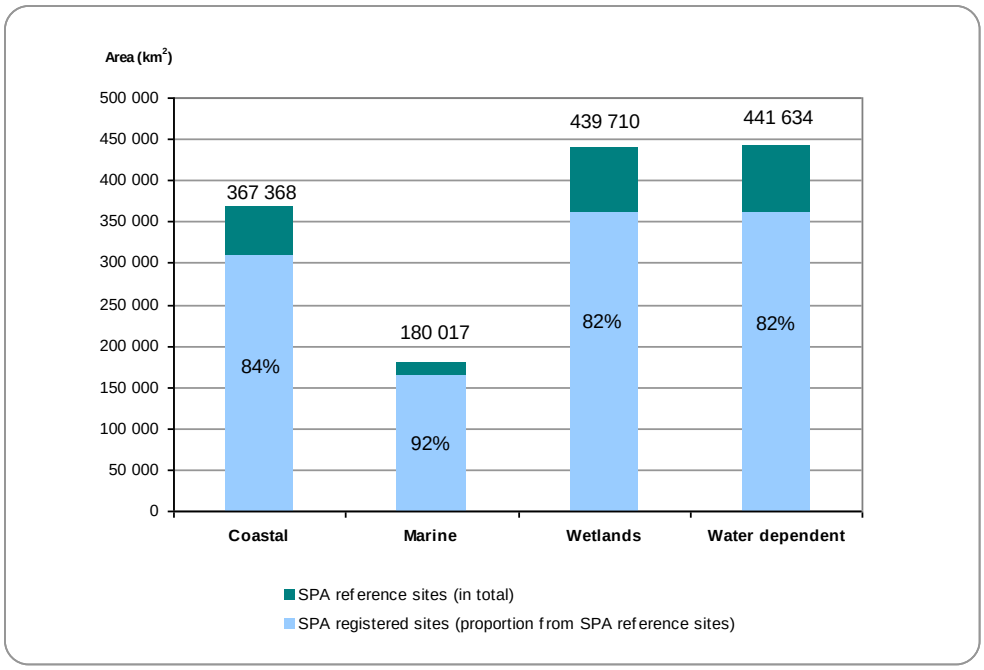


Figure 2: Proportion of SPA Sites Included into the WFD Register

[6] More specifically, MS could applying stricter selection criteria in order to eliminate sites where the occurrence of water-dependent component is less important or where the type of water dependency could be described as "weak" or "indirect" (e.g. non-aquatic habitats dependent on the influence of surface water or on the level of groundwater, species that use surface water for feeding, etc.).

[7] The score of total coverage is incomplete due to missing data for some MS or some RBDs in the WFD Register database, but reflects the real situation as the methodology used adjusts for these data gaps.



- At the same time, the relative percentage of sites designated for at least one water dependent feature included into the WFD Register highly differs between MS (see Figure X and Figure X below). The most complete WFD Register is recognized for Lithuania, Sweden, Slovakia and Hungary, reaching the area proportion from 90 to 100 % for both SCIs/SACs and SPAs. In contrast, the worst score is recognized for Austria, Czech Republic and United Kingdom. In case of some MS there was also a significant difference between the proportion of SCIs/SACs as compared to SPAs (e.g. NL: 33.7 % / 97 %; GR: 94 % / 54 % or EE: 61 % / 97 %).
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Figure 3: Proportion of SCI/SAC Sites in the WFD Register (compared to the Reference dataset of water-dependent Natura 2000 sites)

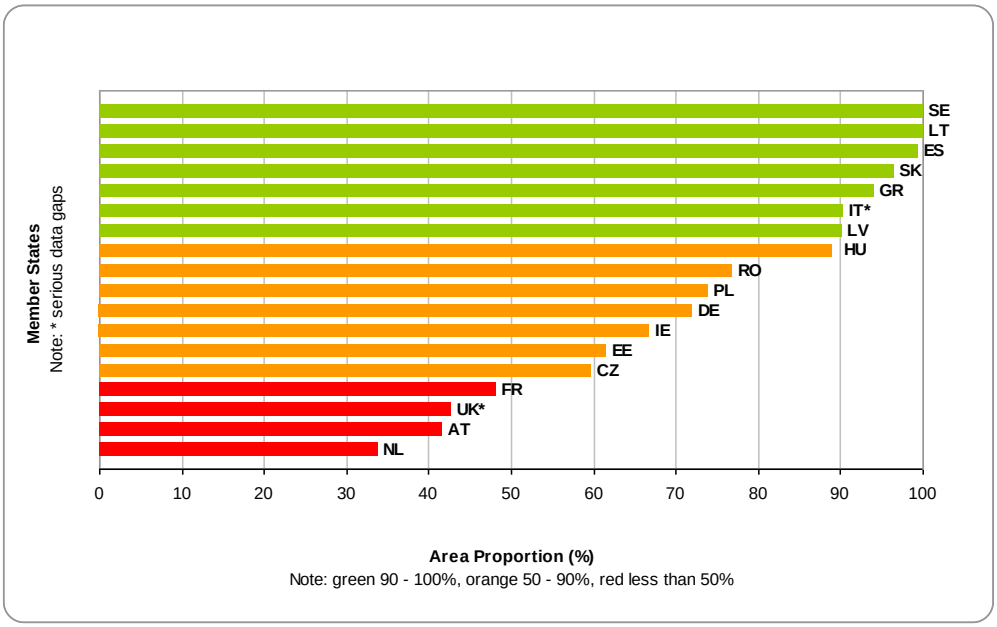
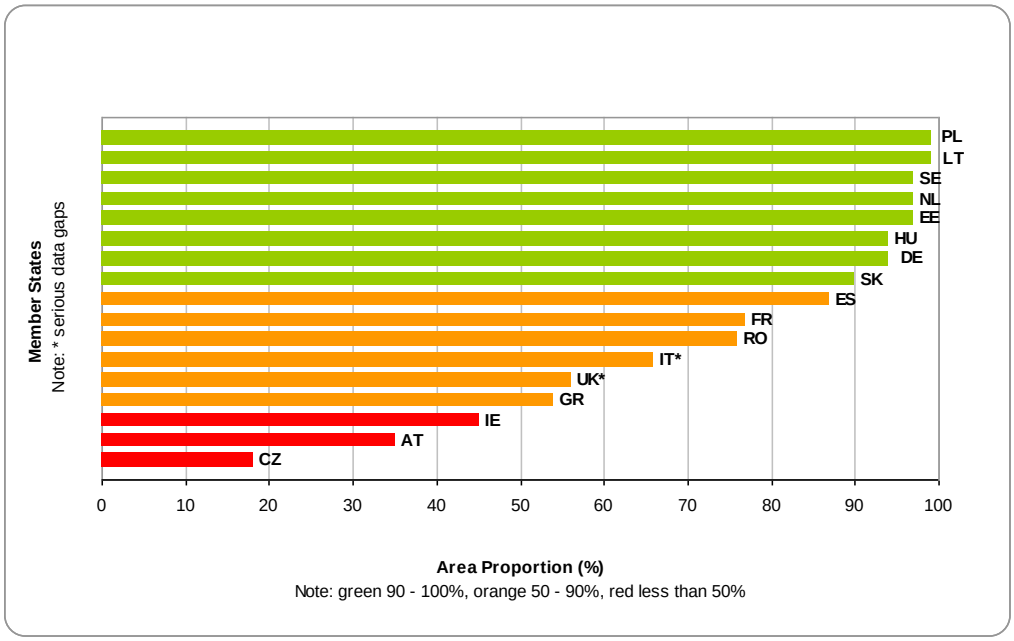


Figure 4: Proportion of SPA Sites in the WFD Register (compared to the Reference dataset of water-dependent Natura 2000 sites)



- These findings can be partly explained by the methodological approach used for sites selection by individual MS and partly by real data gaps. Important factors explaining the proportion of water dependent Natura 2000 sites actually reported by MS as compared to the theoretical reference dataset include:
    - The update of the WFD Register is not always in line with the current status of national Natura 2000 database (designation of new Natura 2000 sites has not been reflected);
    - The approach taken by MS in selecting Natura 2000 sites for inclusion into the WFD Register is variable (less strict or no selection criteria);
    - Consistency of both databases (the WFD Register database and the Natura 2000 database) is not kept in many cases – there are differences in species codes and names, areas of sites, site codes, etc. and also inconsistency between spatial and tabular data.

Annex B: Overview of WFD related MAES Categories

Table 7: Overview of WFD Relevant MAES Categories

Wetlands

Wetlands are predominantly water-logged specific plant and animal communities supporting water regulation and peat-related processes. This ecosystem type includes natural or modified mires, bogs and fens, as well as peat extraction sites (European Commission 2013, 24). Wetlands comprise about 2% of the EU land area (ETC-BD 2011). Wetland ecosystems are important providers of water-related ecosystems services, such as water quality regulation and - depending on their management - can either be significant sources of or sinks for greenhouse gas emissions.

Rivers and lakes

This ecosystem type consists of inland freshwater systems and covers approximately 1% of the EU land area (ETC-BD 2011). Rivers and lakes ecosystems are not only important for providing drinking water, but also for other ecosystems services such as recreation, food, industrial use, and mediation of wastes, and are fundamentally interconnected with many other ecosystems (European Commission 2014). The Habitats Directive includes 19 types of protected freshwater habitats.

Marine inlets and transitional waters

The marine inlets and transitional water ecosystem form the land-sea interface, it is under the influence of tides (where present), and has a salinity level higher than 0.5 ‰. This ecosystem type includes coastal wetlands, lagoons, estuaries and other transitional waters, fjords and sea lochs and bays (European Commission 2013, 24). These ecosystems together with coastal areas make up less than 1% of the EU's land area (ETC-BD 2011). Annex I of the Habitats Directive includes 13 marine inlet and transitional water habitats.

Coastal Areas

Coastal areas are classified as a coastal, shallow, marine ecosystem which is significantly influenced by processes and activities on land. This ecosystem is subject to diurnal fluctuations in temperature, salinity and turbidity, and wave disturbance (European Commission 2013, 24). Annex I of the Habitats Directive includes 8 types of coastal area habitats.

The Shelf

The shelf describes a marine ecosystem that is removed from coastal influence, often known as the Continental shelf which extends down to the break of slope between the shelf and the abyssal plain. This ecosystem type experiences more stable temperature and salinity regimes than coastal systems, as the seabed is below the zone of wave disturbance (European Commission 2013, 24). There are only three Annex I habitats in this ecosystem.

Open Ocean

The open ocean ecosystem is a marine system that is located beyond the shelf break and which has depths beyond 200 m, very stable temperatures and salinity regimes; the deep seabed is particularly considered within the open ocean ecosystem. The marine ecosystem typology is generally applicable across European waters (and globally) and also relates to the use of the marine environment by different sectors, which helps support the assessment of ecosystem services delivered by marine ecosystems (European Commission 2013, 25). There are only two Annex I habitats in this ecosystem.

Source: EEA (2015): State of Nature in the EU

Table 8: Water Dependent Ecosystems under MAES Typology

Major ecosystem category (level 1)	Ecosystem type (level 2)	Representation of habitats (functional dimension by EUNIS)/MSFD for marine ecosystems)	Representation of land cover (spatial dimension)
Terrestrial	**Wetlands**	Mires, bogs and fens	Inland wetlands (marshes and peatbogs)
Fresh water	**Rivers and lakes**	Inland surface waters (freshwater ecosystems)	Water courses and bodies incl. coastal lakes (without permanent connection to the sea)
Marine	**Marine inlets and transitional waters**	Pelagic habitats: Low/reduced salinity water (of lagoons) Variable salinity water (of coastal wetlands, estuaries and other transitional waters) Marine salinity water (of other inlets) Benthic habitats: Littoral rock and biogenic reef Littoral sediment Shallow sublittoral rock and biogenic reef Shallow sublittoral sediment	Coastal wetlands: Saltmarshes, salines and intertidal flats Lagoons: Highly restricted connection to open sea, reduced, often relatively stable, salinity regime Estuaries and other transitional waters: Link rivers to open sea, variable, highly dynamic salinity regime. All WFD transitional waters included Fjords/sea lochs: Glacially derived, typically elongated and deep; marine salinity regime Embayments: Non-glacial origin, typically shallow, marine salinity system Pelagic habitats in this type include the photic zone, benthic habitats can include it or not
	Coastal	Pelagic habitats: Coastal waters Benthic habitats: Littoral rock and biogenic reef Littoral sediment Shallow sublittoral rock and biogenic reef Shallow sublittoral sediment	Coastal, shallow-depth marine systems that experience significant land-based influences. These systems undergo diurnal fluctuations in temperature, salinity and turbidity, and are subject to wave disturbance. Depth is up to 50-70 meters. Pelagic habitats in this type include the photic zone, benthic habitats can include it or not.

Source: EC (2013)

Annex C: Assessment of WFD Data for use in Guidance Document

As a starting point Ecologic Institute assessed previous work by the ETC-ICM on a crosswalk between the WFD and the HD. This draft note summarizes potential linkages between data reported under the RBMPs of the Water Framework Directive (WFD) and Article 17 reporting of the Habitat Directive (HD) under Task 175A. The note covers the following issues:

1. Overview analysis on the usefulness of the broad types approach (ETC-ICM report 2/2015) to be used for harvesting additional information on pressures related to water depended Habitats Directive habitats and species
2. Next steps of comparing WFD pressure data with HD Habitat or species for related freshwater habitats with help of HD broad types

Using broad types to assess comparable data reported under the WFD and HD

As part of the ETC-ICM Crosswalking exercise in 2014 (Link) WFD ecological status and pressures of water bodies reported by Member States with their 1st RBMPs in the period 2010- 2011 have been aggregated to the broad types based on the similarity of national types. Natural and heavily modified (HMWBs) and artificial water bodies (AWBs) were merged for this analysis, due to the intention to provide a simple overview of type-specific differences of all water bodies.
Many national WFD types have high similarity and may be aggregated into 20 broad river types and 15 broad lake types based on altitude, size and geology (and mean depth for lakes). There is a reasonable match between these WFD broad types, the WFD Intercalibration common types and the HD freshwater habitat types, as well as EUNIS types for both rivers and lakes, with the exception of two very wide HD river habitats, the HD type 3260 rivers from plain to montane levels, and 3210 Fennoscandian rivers, as well as some very narrow HD and EUNIS types.
However, there is one important limitation: The 20 broad river types include 575 national types and about 87% of river water bodies in Europe; 15 broad lake types include about 290 national types and 73% of lake water bodies in Europe (LINK). In other words the broad types don't cover 100 % of all water bodies.
Another result of the ETC-ICM document was that the differences between WFD ecological status and pressures of rivers and lakes aggregated into the HD biogeographic regions show that water bodies in the Alpine and Boreal areas of Europe are in better status. Assessments of freshwater status and pressures reported under the WFD are mostly consistent with assessments of conservation status and threats reported under the Habitats Directive for WFD types that are comparable to HD freshwater habitats. Inconsistencies and mismatches are due to non-comparable types/habitats and/or to non-comparable assessment systems.

Objective

As part of the ongoing ETC-BD work we tried to analyse, how useful the broad type approach is to link WFD pressure data for specific HD habitats on MS level. This analysis goes beyond the cross-walking exercise that looked only at all HD water habitats at the same time (Rivers and Lakes levels). We choose the example of Germany.

Results related to the linkage of broad types to habitat types

Rivers

For Germany only one habitat type, 3270 Rivers with muddy banks with Chenopodion rubri p.p. and Bidention p.p. vegetation, could be linked directly to the broad type system. WFD pressure data in the figures below show the main pressure categories (Level 1) used in the WISE reporting system.

Figure 5: Links between WFD broad river types with HD and EUNIS river habitat types used for analysis (based on EEA ETC-ICM Report 2/2015)

	Broad River types	HD Habitat types	EUNIS Habitat types
Lowland	**4.** Lowland, Calcareous or Mixed, Medium-Large **5.** Lowland, Calcareous or Mixed, Very small-Small **6**. Lowland, Organic and Siliceous **7. Lowland, Organic and Calcareous/Mixed**	**3270** Rivers with muddy banks with Chenopodion rubri p.p. and Bidention p.p. vegetation	**C2.3** Permanent non-tidal, smooth-flowing watercourses

This habitat type is bound to near-natural watercourses with annual nitrophilous vegetation on muddy banks. Theoretically, also HD water habitat 3220, 3230, 3240 could have been linked. However, the respective alpine rivers are not mapped for Germany.

Lakes

For Lakes the habitat types 3110, 3150, 3160 and 3130/3140 could be linked via the broad types.

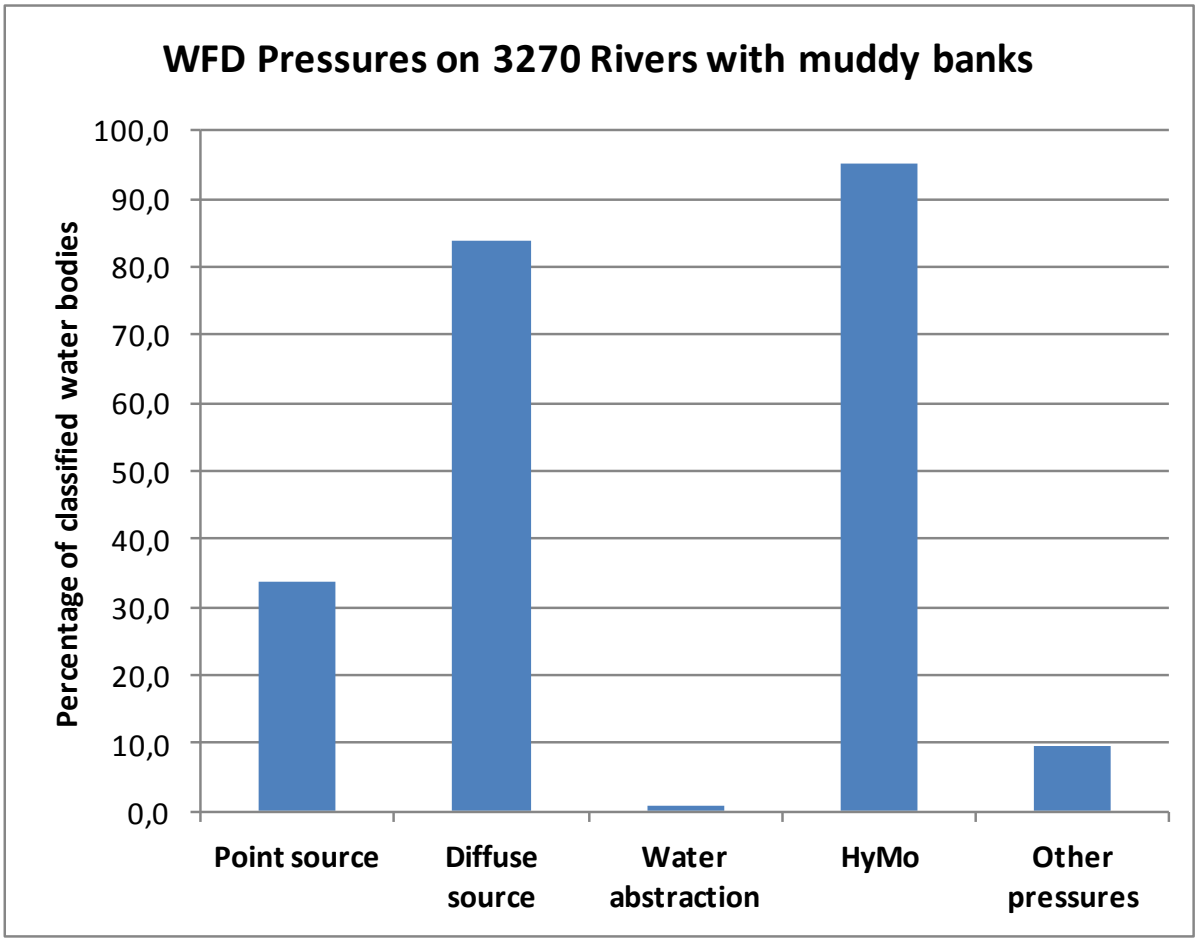
Figure 6: Links between WFD broad lake types with HD and EUNIS lake habitat types used for analysis (based on EEA ETC-ICM Report 2/2015)

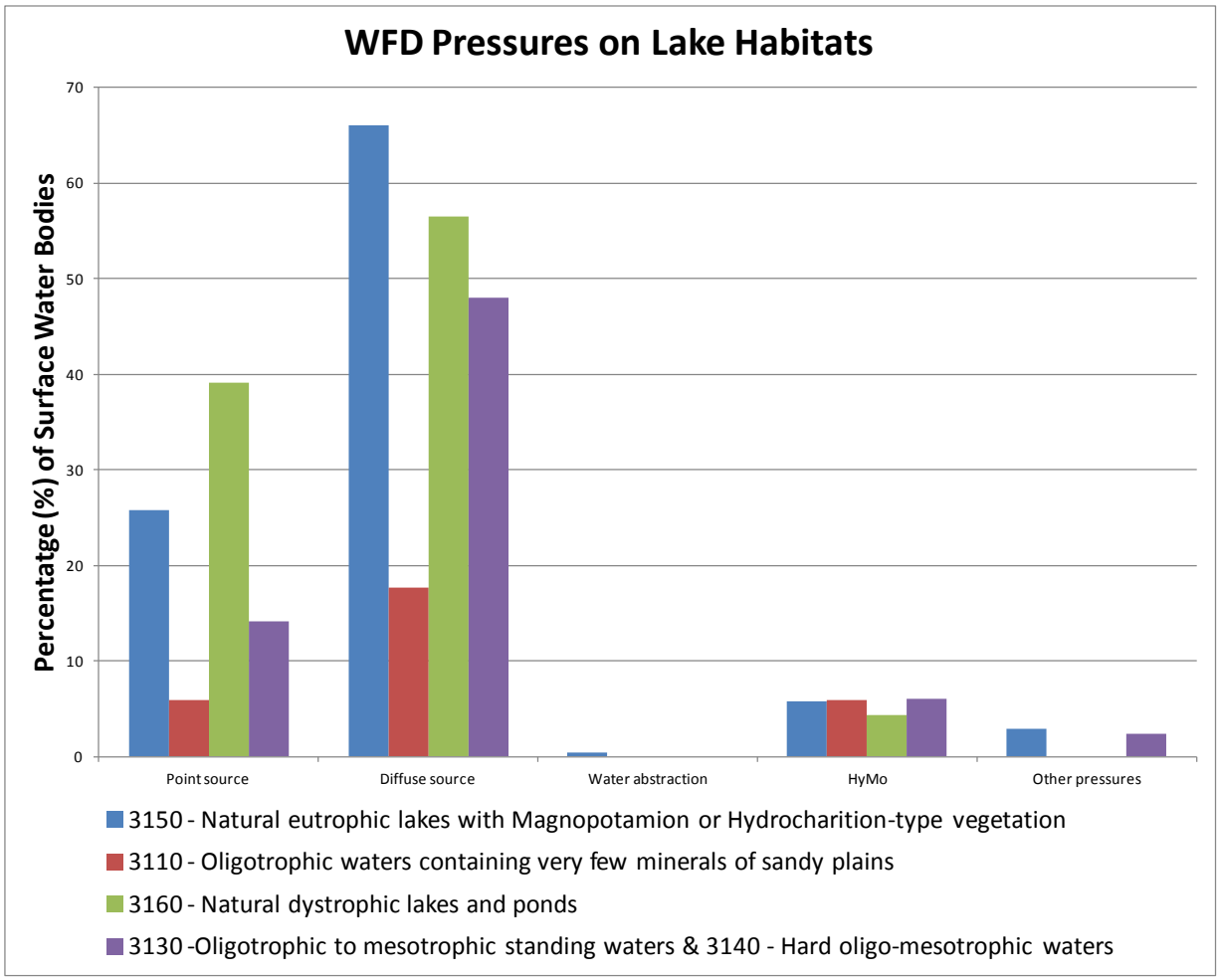
Broad Lake types		HD Habitat types	EUNIS Habitat types
Lowland	**2.** Lowland, Siliceous	***3110*** *Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae)*	**C1.1** Permanent oligotrophic lakes, ponds and pools
		3130 Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojuncetea	
	3. Lowland, Shallow, Calcareous/Mixed	***3130*** *Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojuncetea* ***3140*** *Hard oligo-mesotrophic waters with benthic vegetation of Chara spp.*	**C1.2** Permanent mesotrophic lakes, ponds and pools
	4. Lowland, Calcareous/Mixed, Very shallow/unstratified	***3150*** *Natural eutrophic lakes with Magnopotamion or Hydrocharition — type vegetation*	**C1.3** Permanent eutrophic lakes, ponds and pools
	5. Lowland Organic (humic) and Siliceous	***3160*** *Natural dystrophic lakes and ponds*	**C1.4** Permanent dystrophic lakes, ponds and pools
	6. Lowland Organic (humic) and Calcareous/Mixed		
Mid-altitude	**6.** Mid altitude, Siliceous	***3110*** *Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae)*	**C1.1** Permanent oligotrophic lakes, ponds and pools
	8. Mid-altitude, Calcareous/ Mixed	***3130*** *Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojuncetea*	**C1.2** Permanent mesotrophic lakes, ponds and pools
		3140 *Hard oligo-mesotrophic waters with benthic vegetation of Chara spp.*	
	9. Organic	***3160*** *Natural dystrophic lakes and ponds*	**C1.4** Permanent dystrophic lakes, ponds and pools
	10. Mid altitude, Calcareous/Mixed		
Highland	**11**. Highland, Siliceous	***3110*** *Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae)*	**C1.1** Permanent oligotrophic lakes, ponds and pools

Results on pressures reported under the WFD

For surface waters the WFD requires the identification of significant pressures from point sources of pollution, diffuse sources of pollution, modifications of flow regimes through abstractions or regulation and morphological alterations, as well as any other pressures. 'Significant' is interpreted as meaning that the pressure contributes to an impact that may result in the failing of Article 4(1) Environmental Objectives of the WFD.

Data on pressures reported under the WFD were assessed for surface water bodies linked with a national river or lake type that could be associated with a habitat type under the Habitat Directive (see above). A graphic depiction of the results for rivers and lakes can be seen below.





Preliminary conclusions on WFD data:

- For rivers the approach used is somewhat limited; no additional information regarding pressures has been identified.
- For lakes the situation is lightly better in terms of additional information (?), but the MS scope is not really helpful.
- For lakes a European wide assessment for a few selected habitats could be carried out. However, this exercise would take some time, because the data needs to be prepared.
- The broad type system can be used to derive pressure related information for selected habitats, whereas it may be more difficult to derive useful information on species. For example, it is hardly applicable for species in the case of Germany, as many water dependent species listed under the HD live in different river (e.g. Salmo salar) or lake types.
- In some cases the EU common intercalibration types could be more useful to directly link to the HD habitat types

Comparison of data reported under WFD with HD data on pressures and threats

In order to take a more thorough look at comparable data on pressures (& threats) reported under the WFD and HD, a more detailed analysis was made in the form of a table. The result can be found in the excel workbook entitled "WFDHD_PressuresThreats_DE_Final.xlsx", which accompanies this document, under the sheet entitled "WFDHD_DE_Table".

The table features:

- The broad type (WFD)/habitat type (HD) linkage from the ETC-ICM Cross-walk exercise.
- Information on the water-dependency from the table in the Irish guidance document which initially triggered the assessment of water-dependent habitats and species.
- The results from the assessment of the pressures reported for surface water bodies under the WFD (see above) presented per habitat type.
- Separate results on pressures and threats from Member State reporting for each biogeographical region and each habitat type. Furthermore, these pressures and threats are divided into three separate categories to make them more easily comparable with the WFD data and largely correspond with the Irish guidance document: water pollution, hydrological pressures and 'other'. Where pressures and/or threats were reported differently for the same habitat type, biogeographical region, and P&T category, these differences were marked in bold. The importance of each pressure or threat is also represented by a range summarizing the level of importance at which the P&T for each category were ranked/reported by the MS.
- Finally, a notes section summarizes the key findings from the data on pressures (and threats) reported for each habitat type and compares the WFD and HD results. Findings relating to the comparison of the two data sets are marked in bold.

A summary of the key findings from this analysis can be seen below:

Observations:

- There are large differences in the number of surface water bodies (SWB) linked to a habitat type. The largest number of SWB are linked to the habitat type 3270 "Rivers with muddy banks with Chenopodion rubri p.p. and Bidention p.p. vegetation" with more than 2000, whereas the number for lakes ranged from less than 50 to more than 200.
- The conservation status of the Alpine Region is reported as favourable for all of the habitat types assessed. Furthermore, frequently no pollution or hydro-morphological pressures are reported in the Alpine Region. This observation corresponds with the finding of the ETC-ICM document on cross-walks that water bodies in the Alpine and Boreal areas of Europe are in better status.
- It can broadly be stated that the share of SWB reporting point and diffuse pollution pressures under the WFD seems to conform with the reporting and ranking of pollution pressures under the HD for the Atlantic and Continental Regions. Pollution P&T for lake and river habitats under the HD were generally ranked medium or high, with slight regional differences (High ranked P&T might be said to be slightly more prevalent in the CON region than the ATL region). In addition to pollution to surface waters more broadly, diffuse pollution from agriculture more specifically, and pressures linked to agriculture (ex. Nitrogen-input: fertilisation) are commonly reported and highly ranked as P&T.
- It can broadly be stated that the share of SWB reporting hydro-morphological pressures under the WFD is low or zero for lakes, while it is high or significant for rivers. At the same time, hydro-morphological impacts are commonly reported as P&T under the HD for both lakes and river habitats. As such, the share of SWB reporting hydro-morphological pressures under the WFD does not seem to correspond with the significance of these pressures indicated under HD reporting for lakes, while it can be said to correspond with their significance for rivers.
- Hydro-morphological changes are most commonly reported under the HD as the Level 02 category 'human induced changes in hydraulic conditions' or the Level 03 category 'modification of hydrographic functioning, general', which are not very revealing. As such the specific P&T and drivers are often difficult to determine. Additional P&T categories reported may give additional insights, but are frequently ranked as being of low or medium importance.
- 'Water abstraction' is rarely reported under the WFD and the HD. More importantly, there is no conformity between reporting. Where it is reported under the WFD it is not reported under

the HD and vice versa. It can also be mentioned that it is only reported as a P&T in the ATL biogeographical region under HD reporting.

- 'Other pressures' are also rarely reported under the WFD in Germany. It is also not possible, based on the aggregated data, to determine the driver or category of these pressures. In contrast, several low to high ranked P&T were reported in all regions under the HD, even when no pressures were reported for the WFD. Natural biotic and abiotic processes, fishing and harvesting aquatic resources, marine and freshwater aquaculture and human intrusions and disturbances (ex. recreational activities) are most commonly reported. Of these pressure types fishing and harvesting aquatic resources, marine and freshwater aquaculture and to some extent human intrusions and disturbances can be said to reflect in the WFD reporting, whereas natural biotic and abiotic processes, among others, do not correspond to a pressure category under the WFD. These differences in reporting can be said to make it possible to use HD data to supplement WFD data, a direct comparison should focus on P&T categories that correspond with one another. Such a cross-walk of pressure & threat categories was carried out for the ETC-ICM crosswalk exercise and should be used as a basis for comparing future WFD data with HD data.
- In filling in the table, it is generally much easier to make an assessment on pollution and hydro-morphological pressures as they are summarized based on data from the same Level 2 category. Summarizing 'other' pressures, on the other hand, is inherently more time consuming, while seemingly yielding little added value in the context of comparing WFD and HD data.
- Some differences can be observed when comparing pressures & threats reported by Germany, both between biogeographical regions and within a specific habitat. For many habitats slight differences in the P&T reported can be seen between biogeographical regions. For example, water abstraction from groundwater is reported under HD reporting only for some habitat types and only reported for the Atlantic biogeographical region. These differences may help indicate which regions and habitat types are most impacted by this pressure. At the same time, Germany has sometimes reported pressures and threats slightly differently, most commonly with additional categories reported as threats. These differences in reporting of pressures and threats may help to indicate which impact categories are likely to grow in insignificance compared to the status quo. It, however, also highlights that P&T categories are interpreted differently by experts in charge of reporting. For example, while the broad Level 02 categories 'Pollution to surface waters (limnic & terrestrial, marine & brackish)' and 'Human induced changes in hydraulic conditions' are commonly reported as both pressures AND threats, some Level 03 categories, such as 'diffuse pollution to surface waters due to agricultural and forestry activities,' are commonly reported as only a threat.

Future developments and next steps

What is new under the 2nd reporting cycle of the WFD?

In the new reporting cycle GIS information will be reported in GML file format for all river water bodies, not just the main rivers as was the case in the 1st round (2010-2011).
Furthermore, the new WFD reporting guidelines (LINK) concerning pressures, impacts and drivers have been much improved, compared to the last reporting round. Specifically, more detailed data on pressures will be available and this will allow better matching of many of the HD pressures related to hydro-morphology, e.g. matching the WFD pressures "Abstraction/Flow diversion" and "Physical alteration of channel/bed/riparian area" with the HD pressure "J02.03 Canalisation and water deviation". Furthermore, the HD pressures related to reduction of habitat connectivity is listed as an impact of morphological changes rather than as a pressure in the new WFD reporting guidance, and climate change is listed as a driver. Together the improvement of GIS and pressure data will allow for a more detailed matching and comparison of water bodies with HD habitat and, especially, HD species information, including through the use of GIS spatial analysis.

When to expect new data from the 2nd reporting cycle of the WFD?

Member States were required to report to the Commission on their second RBMPs by end of March 2016, and the Commission will produce another implementation report by December 2018 at the latest. As of now, only a few countries reported their RBMPs to the Commission. Only a part those MSs who have reported their RBMPs also delivered the respective GIS data. There are already now some data in the WISE-WFD database (ca. 4-5 countries). By February 2017, there could be ca 15-20 countries with reported raw data, it is unlikely that the full database will be ready. It is unclear when all MS will complete their electronic reporting. Nonetheless, **at that time an assessment of the quality of the data and the usefulness of further GIS analyses may be possible and should be pursued**. The results of the ETC-ICM analysis of the complete database cannot be expected until much later in the year.

Annex D:

Pressures and Threats under Nature Directives Reporting

For Article 12 and 17 reporting, pressures are considered to be factors which are acting now or have been acting during the reporting period, while threats are factors expected to be acting in the future. It is possible for the same impact to be both a pressure and a threat if it is having an impact now and this impact is likely to continue.
A recommendation is made to the MS that the time span for pressure is the reporting period, i.e. 6 years. For threat the recommended time span is 2 reporting periods (i.e. 12 years) into the future. The threats should not include theoretical threats, but rather those issues judged to be reasonably likely to occur.
A list of pressures and threats is used for the assessment, which can be found on the Article 12 and 17 reference portals. The same list is used for the Standard Data Form for Natura 2000 reporting. Following new additions and changes, the most recently updated version of the list groups threats and pressures into several hierarchical levels, containing 17 headings on the 1st hierarchical level, 75 categories at the 2nd hierarchical level (ex. C.01 – Mining and Quarrying), 209 categories at the 3rd hierarchical level (, and 112 categories at the 4th hierarchical level. These levels represent increasingly narrow categorization. For example:

- Level 1: C – Mining, extraction of materials and energy production
- Level 2: C01 – Mining and Quarrying
- Level 3: C01.04 – Mines
- Level 4: C01.04.01 – Open cast mining

Member States are asked to use the lowest number of possible data entries to adequately describe the situation and at least the 2nd hierarchical level of the list e.g. A01 – Cultivation. However, Member States or users who need more precision can use 3rd level and 4th level categories.

In addition to the type of pressure and threat for each habitat and species, Member States also ranked the relative importance of the pressure or threat into one of three categories:

Table 9: Categories for Ranking Pressures and Threats

Code	Meaning	Comment
H	High importance/impact	Important direct or immediate influence and/or acting over large areas.
M	Medium importance/impact	Medium direct or immediate influence, mainly indirect influence and/or acting over moderate part of the area/acting only regionally.
L	Low importance/impact	Low direct or immediate influence, indirect influence and/or acting over small part of the area/acting only regionally.

As the intention is not to report every existing threat or pressure the total number of data entries is strictly limited to a **maximum of 20** (to avoid very long lists of threats and pressures of minor importance). Moreover, the number of entries with the **highest rank** is limited to a **maximum of 5** data entries. This makes it possible to identify the most important factors at a European scale[8].

[8] As pollution can have varying effects depending on the substances involved and have quite different sources, an additional qualifier for the specific kind of pollutants can be used (ex. N – Nitrogen input or P – Phosphor/Phosphate input). This qualifier is optional, but can be used for the whole pollution section referring to the main ecologically important component of the pollution, and may also be applied for other

Under Article 12 reporting, pressures and threats were only required to be reported for birds triggering SPA classifications, i.e. species and subspecies listed in Annex I of the Birds Directive, and a selection of regularly occurring migratory species not listed in Annex I. The list of relevant taxa can be found in the 'Checklist of SPA trigger species' in the Article 12 Reference Portal[9]. Moreover, under Article 12 reporting, no distinction was made between pressures and threats, whereas under Article 17 reporting pressures and threats were assessed separately. Finally, it should be noted that the Birds data is not associated with biogeographical data.

Reporting practices and peculiarities

Member States report pressures and threats in the context of individual habitat and species reports under Article 17 and bird species reports under Article 12. In each report, pressures and threats are reported separately for each biogeographical region. Therefore, in general the share a Member State contributes to the total pressures and threats data reported is proportional to the number of non-bird species, habitats, birds and biogeographical regions for which they were required to report (See Table 1). Accordingly, France, Spain, Romania, Bulgaria, Portugal and Italy have reported a relatively high share of pressures and threats as they have a submitted a relatively high number of reports. By contrast, Cyprus and Malta submitted a lower number of reports and had lower share of the total pressures and threats data collected.

When reporting for a specific non-bird species, habitat or bird, Member States typically reported a specific activity or impact as both a pressure and a threat. As a result, reported pressures and reported threats each make up nearly exactly half of the overall number of pressures and threats reported. One notable exception to this general occurrence is climate change, which was much more frequently reported as a threat than a pressure.

Next to these broader factors influencing the data, the nature of the code list sets the framework in which Member States report pressures and threats and also strongly influenced the data reported. Some differences in the reporting of pressures and threats are, therefore, due to the structure of the code list of pressures and threats. For example, while there were a large number of reporting options at Level 3 for the overarching Level 1 category J (*Natural System modifications*), there were few for I (*Invasive, other problematic species and genes*) and none at all for the category L (*Geological events, natural catastrophes*).

The share of pressures and threats reported at level 2 and 3 and the average number of pressures and threats reported per species or habitat also varied considerably between Member States. For example, while FR and UK both reported nearly 100% at Level 2, NL and SE are examples of Member States that had higher shares of pressures and threats reported at Level 3.

Moreover, while some Member States such as AT, LT, NL and SK generally reported a relatively low number of pressures and threats per species or habitat, others, such as ES, FR and the UK generally reported a relatively high number of pressures and threats. Similarly, LT, RO and SI had a relatively high share of pressures and threats ranked as being of 'high importance', whereas SK and DK had a relatively low share.

It should be noted that some differences in reporting at level 2 or level 3 are to be expected due to differing conditions for habitats and species within individual Member States. However, the data indicate that there are differences in reporting approaches that go beyond what can be explained through on-the-ground conditions. These peculiarities should be taken into account when assessing the Member State data.

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categories which have an indirect pollution effect. However, due to the optional nature of the pollution qualifier it was infrequently reported by Member States, preventing its use for Europe wide analysis.

[9] http://bd.eionet.europa.eu/activities/Reporting/Article_12/reference_portal

It should also be born in mind that while largely comprehensive, the list of pressures and threats was by necessity developed in a delicate balance between complexity/specificity and simplicity/ease-of-use and is not able to capture all pressures and threats equally well. In particular, cross-cutting pressures and threats are particularly difficult to associate with individual pressures and threats. For example, eutrophication was noted as a cross-cutting issue of particular importance during data analysis following the 2001-2006 reports. However, direct nutrient input is coded under different threats and pressures as for example 'H03.02 air borne nitrogen input' and several other threats such as lowering of the groundwater table can have indirect effects resulting in eutrophication. As a result, Member States are unlikely to report all pressures and threats in a similar manner.