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European Freshwater Ecosystem Assessment: Cross-walk between the Water Framework Directive and Habitats Directive types, status and pressures

ETC/ICM Technical Report 2/2015

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Executive summary

The EU policies on the freshwater environment and nature and biodiversity are closely linked. The aims of the Water Framework Directive (WFD) and the Habitat Directive (HD) are to achieve good status for water bodies (WFD) and for habitats and species (HD) respectively. The types of rivers and lakes and their ecological status and pressures under the WFD are not directly comparable to the conservation status and threats for freshwater habitats and species under the HD (EC 2011a).

The objective of this study has been to explore the possibilities of linking WFD and HD information on types of water bodies and habitats, and their status, pressures and measures, using WISE WFD information on types, ecological status, pressures and measures (EEA 2012, ETC-ICM 2012) and HD information on habitat types, conservation status and threats (EC 2007). The results may be used as input to the EEA Freshwater Ecosystem Assessment in 2015, and also for future European assessments of specific objectives, status and trends for various types of rivers and lakes after the reporting of the WFD 2nd RBMPs and the next HD article 17 reporting. The outcome may also be used as a basis for discussions of the potential and limitations for WFD and HD synergies in terms of monitoring programmes, assessment systems and measures to improve status.

The general methodology used in this report is to analyse data and information reported by Member States on WFD types, ecological status and pressures in river and lake water bodies and on Habitats Directive freshwater habitats and their conservation status and threats. The major data sources used are the WISE-WFD database and the HD Article 17 database.

Type comparisons across the Water Framework Directive and the Habitats Directive

To allow comparisons of WFD types with HD types, a common denominator in terms of broad types were needed. The WFD Intercalibration (IC) common types could not be used directly for this purpose due to the fact that only 22% of national WFD types were reported to be linked to these IC common types in the reporting of the first river basin management plans (RBMPs). A new set of broad types were therefore needed. A combination of cluster analysis combined with an iterative dialogue with Member States, through the WFD-CIS WG ECOSTAT, was applied to assess the national type similarity based on the most commonly used typology factors altitude, geology and catchment area for rivers, and altitude, geology (alkalinity and colour), surface area and mean depth for lakes. 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), including most EU countries and Norway. These broad types include 87% of WFD river water bodies and close to 600 national WFD river types and 74% of WFD lake water bodies and close to 300 national WFD lake types in the countries included. These broad types were found to match most of the WFD Intercalibration common types and are well suited to aggregate WFD status and pressure information.

Similarities between the broad types and the freshwater habitat types of the HD and EUNIS systems were based on the type descriptions and on assumptions of links between geology/alkalinity and natural trophic status and/or key plant species. A reasonable match was found between the WFD broad 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.

There is no formal connection between these broad types and the WFD reporting obligations, but they can be used as a tool to aggregate WFD data reported by Member States for national types, e.g. nutrient boundaries (standards) and the 2nd cycle RBMPs status and pressure data.

Water Framework Directive ecological status and pressures on water bodies aggregated to broad types of rivers and lakes and to Habitats Directive biogeographic regions

The WFD ecological status of rivers and lakes aggregated to broad types show best status for water bodies in highland or mid-altitude areas with siliceous geology and worst status for small water bodies in lowland areas with calcareous geology, which is consistent with the different pressure intensities. The large and deep lakes are mostly in good ecological status, while the large rivers are mostly in moderate or worse status.

WFD water bodies were linked to the HD biogeographic regions through GIS analysis to aggregate WFD status and pressure information for rivers and lakes within each region. The results show that water bodies in the Alpine and Boreal areas of Europe are in better status and have lower pressures than those in other parts of Europe.

The ecological status of both river and lake water bodies associated with the Natura 2000 sites is slightly better than for all water bodies in most Member States. This is consistent with the expectation that there should be fewer pressures in the Natura 2000 sites than elsewhere. At the EU level for rivers, 57% of the water bodies within the Natura 2000 sites are in a good or better status, while only 44% are in a good or better status for all river water bodies. For lakes the difference at the EU level is even larger, with 71% of the water bodies within the Natura 2000 sites in a good or better status, while only 58% are in a good or better status for all lake water bodies.

There are deviations from this general pattern for several calcareous lake types in the lowlands where better status is reported for all the water bodies than for those within the Natura 2000 sites. These are nutrient rich lakes which are often protected due to their value for aquatic birds, but do not always have good ecological status in WFD terms.

Comparisons of status and pressures/threats of Water Framework Directive and Habitats Directive

The WFD ecological status is reported for each water body as one of five classes: high, good, moderate, poor and bad, based on a combination of biological quality elements and supporting abiotic quality elements. The HD conservation status is reported for each freshwater habitat and species in each of the HD biogeographic regions as one of four classes: favourable, inadequate, inadequate (deteriorating) and bad. The criteria for status classification are different in the two directives, so no direct translation is possible between the status classes of the two directives. Another difference between the two directives are that the national assessment systems for WFD ecological status have been intercalibrated among countries sharing similar types of rivers and lakes, while this has not been done for the national assessment systems for the HD conservation status. Countries have applied different methods for assessing the conservation status, which may cause the same habitat type in the same region to have radically different statuses in neighbouring countries. Therefore, status assessments of the two directives can presently only be done for single countries.

Single country comparison of WFD and HD status done for Sweden, Germany, Ireland and Hungary revealed that there is a reasonably good match between the status and the most commonly reported pressures for single countries in broad WFD types and in the corresponding habitat types/biogeographic regions for the same countries.

The main categories of pressures/threats used in the WFD and HD are relatively comparable for pollution, water abstraction and hydromorphological modifications, while the sub-categories differ between the two directives. The WFD list of pressures can be improved for the next reporting cycle to match the revised pressures under the HD, especially for some items in the category “FlowMorph”, “RiverManagement”, “Fishing”, “Introduced species” and “Climate change”.

Thus, in summary, these results suggest that the status and pressures/threats assessment systems of the two directives seems to match for most of the countries and most of the broad WFD types that can be related to freshwater habitats, although there are particular types and habitats that do not match. The reasons for mismatching need further exploration.

Measures with mutual benefit for water management and nature protection

Key categories of measures targeting freshwater habitat pressures have joint benefits for water management (WFD and other water directives) and nature protection with relevance for the conservation of a selection of freshwater species, e.g. WFD measures that aim at removing barriers for fish migration, such as the salmon and the sturgeon, or restoration of floodplains. Several case studies are included that illustrate measures with beneficial effects both in terms of water management (river restoration, flood protection etc.) and nature protection (e.g. establishment or conservation of protected areas) of rivers.

1 Introduction and objective

The EU policies on the freshwater environment and nature and biodiversity are closely linked. The aims of the Water Framework Directive (WFD) and the Habitats Directive (HD) are to achieve good status for water bodies (WFD) and for habitats and species (HD) respectively. Together they form the backbone of Europe's environmental protection of ecosystems and their services.

The two directives use different systems to assess the status of the environment. The HD requires assessment of conservation status for pre-defined habitats and species. The HD Natura 2000 sites represent a selection of areas that are of special conservational interest, “that contributes significantly to the maintenance and restoration of favourable conservation status of a natural habitat type in Annex I or of a species in Annex II”. In the HD, the protection of certain species or habitats are central in defining the areas of interest, including the freshwater habitat types and species listed in those two annexes under the main habitat categories of running waters and standing waters.

On the other hand, the WFD requires assessment of good ecological status of all water bodies in rivers, lakes and coastal waters based on biological quality elements defined as different groups of aquatic organisms (phytoplankton, phytobenthos, macrophytes, macroinvertebrates, fish) and supporting physico-chemical quality elements (e.g. nutrients, organic matter, oxygen). The composition and abundance of species within each of the biological quality elements that are sensitive or tolerant to major pressures on water bodies (e.g. nutrients and organic matter coming from point or diffuse sources, or hydromorphological pressures causing habitat alterations), should be used to indicate the ecological status of each water body (WFD Annex V). The WFD assessment defines good ecological status as slight deviations from reference conditions for different types of water bodies. These types are not predefined, but should be based on natural abiotic environmental factors, e.g. altitude, geology, size etc. (WFD Annex II). The reference conditions are defined as the status of a water body with minimal human pressures, where the biological quality elements and the supporting physic-chemical quality elements are in their natural or pristine state.

Due to these differences in assessment systems of the WFD and HD, the ecological status of water bodies under the WFD is not directly comparable to the conservation status of freshwater habitats and species under the HD (EC 2011a).

The objective of this study has been to explore the possibilities of linking WFD and HD information on types of water bodies and habitats, and their status, pressures and measures, using WISE WFD information on types, ecological status, pressures and measures (EEA 2012, ETC-ICM 2012) and HD information on habitat types, conservation status and threats (EC 2007). The results may be used as input to the EEA Freshwater Ecosystem Assessment in 2015, and also for future European assessments of specific objectives, status and trends for various types of rivers and lakes after the reporting of the WFD 2nd RBMPs and the next HD article 17 reporting. The outcome may also be used as a basis for discussions of the potential and limitations for WFD and HD synergies in terms of monitoring programmes, assessment systems and measures to improve status.

2 Methodology and approaches

The general methodology used in this report is to analyse data and information reported by Member States on WFD types, ecological status and pressures in river and lake water bodies and on Habitats Directive freshwater habitats and their conservation status and threats. The major data sources used are the WISE-WFD Article 13 database from 2010 and the HD Article 17 database from 2006. More recent updates of the two databases have also been used whenever needed.

The ETC-ICM 2012 and ETC-BD 2008, 2011, 2013 reports have been used as a basis for analysis.

To allow comparisons of WFD types with HD types, new broad types were established and used to aggregate national WFD types in dialogue with Member States, through the WFD-CIS WG Ecostat. Expert judgement was used to identify the broad types based on assessment of similarities between national types and broad types. These broad types were also used to aggregate WFD status and pressure information. The WFD Intercalibration common types (EC 2013) were also compared to these new broad types. Similarities between the broad types and the freshwater habitat types of the HD and EUNIS systems were based on the type descriptions and on assumptions on links between geology/alkalinity and natural trophic status and/or key plant species.

WFD water bodies were linked to the HD biogeographic regions through GIS analysis to aggregate status and pressure information for rivers and lakes within each region.

More details on the methodology and approaches used are given in each of the main chapters below.

3 Comparison of freshwater types of the Water Framework Directive and the Habitats Directive

3.1 Existing typology systems

3.1.1 WFD national types of rivers and lakes

National types of rivers and lakes have been defined in each Member State (MS) and Norway according to the WFD Annex II Systems A or B, including a variety of typology factors, e.g. altitude, size and geology. The typology factors have been used to establish national types that have different reference conditions for one or more of the quality elements that should be used to assess ecological status according to the WFD Annex V. The analysis of the first WFD-River Basin Management Plans (RBMPs) reported in 2010 showed that Member States have reported altogether 1599 river types and 673 lake types (Lyche Solheim et al. 2012, Nixon et al. 2012). The typology factors most often used are catchment size, altitude and geology for rivers (Table 3.1), and surface area, altitude, mean depth and geology for lakes (Table 3.2), often using alkalinity and colour as proxies for the geology and humic substances in the lake catchment.

Table 3.1 River typology factors used by Member States for definition of national types.

Country	Catchment area	Altitude	Geology	Region	Slope	Ecoregion (#)	Width	Flow/discharge	Alkalinity	Coordinates (LAt_Long)	Fauna type	Colour	Conductivity	pH	Substratum	Length /source distance	Morphology	Precipitation	Temperature	Hardness	Energy	Mean depth	Solids
AT	x	x	x	x		x	x	x			x			x									
BE (Fl)	x	x	x	x									x										
BE (W)	x			x	x																		
BG	x	x	x	x	x	x	x								x	x	x				x		
CY								x										x					
CZ	x	x	x	x		x					x												
DE	x	x	x	x			x								x	x							
DK	x						x									x							
EE	x											x											
EL		x		x	x			x															
ES	x	x			x				x	x			x	x					x				
FI	x	x	x	x								x											
FR	x	x	x	x			x		x	x													
HR*	x	x	x																				
HU	x	x	x		x	x																	x
IE			x		x						x												
IT	x	x	x	x	x					x							x						
LT	x	x	x	x	x																		
LU	x	x	x	x	x	x	x		x	x	x		x	x	x		x			x			
LV	x				x																		
NL	x	x	x		x	x	x	x															
NO*		x							x			x											
PL	x	x			x	x							x	x						x			
PT	x	x	x	x				x		x								x	x				
RO	x	x	x	x	x	x		x			x				x			x	x			x	
SE	x	x		x		x			x			x											
SI	x		x			x																	
SK	x	x		x		x	x																
UK	x	x	x			x																	
Count	25	22	18	16	13	12	8	6	5	5	5	4	4	4	4	3	3	3	3	2	1	1	1

Note: Country abbreviations are explained in the glossary (Annex 1). The numbers at the bottom shows the total number of countries reporting that specific factor. The typology factors are sorted from left to right according to the most frequently used factors.

Source: WISE-WFD database 2012 (for EU Member States). * Information provided by Croatia (national WFD authorities through ECOSTAT contact) and by Norway (Norwegian classification guidance 2013)

Table 3.2 Lake typology factors used by Member States in their reporting of RBMPs in 2010.

Country	Mean depth	Altitude	Lake area	Geology	Alkalinity	Region	Residence time	Catchment area	Colour	Depth	Mixing	Conductitivy	Salinity	Ca2+	Coordinates	Hardness	Cl-	Ecoregion (#)	Lake shape	Substratum	Surface temperature	Air temperature	Moisture index	pH	Precipitation
AT	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x				
BE (Fl)					x					x			x							x				x	
BG	x	x	x	x		x	x			x	x		x												
CY	x												x												
DE	x	x	x	x	x	x	x	x			x			x											
DK	x				x				x				x												
EE			x	x					x			x	x			x									
EL	x	x	x	x	x			x			x										x				
ES		x	x		x			x		x		x									x		x		
FI	x	x	x	x	x	x	x		x																
FR	x	x	x		x	x	x	x		x		x		x	x	x	x		x						
HR*	x	x	x	x																					
HU	x	x	x	x																					
IE	x	x	x		x																				
IT	x	x	x	x							x	x			x										
LT	x	x	x	x		x																			
LV	x		x						x			x													
NL		x	x	x	x		x			x							x	x							
NO*	x	x			x				x					x											
PL	x					x					x							x							
PT	x	x	x	x			x	x			x				x	x			x			x			x
RO	x	x	x			x														x					
SE	x	x	x		x	x			x	x								x							
SI	x	x	x	x		x	x																		
UK	x	x		x	x			x																	
Count	21	19	19	14	13	10	8	7	7	7	7	6	6	4	4	4	3	3	3	3	3	1	1	1	1

Note: Country abbreviations are explained in the glossary (Annex 1). The numbers at the bottom shows the total number of countries reporting that specific factor. The typology factors are sorted from left to right according to the most frequently used factors. Norwegian typology factors are based on the national classification guidance from 2013.

Source: WISE-WFD database 2012 (for EU Member States).* Information provided by Croatia (national WFD authorities through ECOSTAT contact) and by Norway (Norwegian classification guidance 2013)

3.1.2 WFD intercalibration common types (IC types) (EC 2013)

To intercalibrate the good ecological status class boundaries for the different biological quality elements in each water category, the Member States were grouped into Geographical Intercalibration Groups (GIGs) where they agreed on a limited number of common types of water bodies (IC types). The typology factors used for the common IC type definition are based on the abiotic characteristics of the water bodies and their environment (Table 3.3). Each of the IC types represent several national WFD types from countries within each GIG, having related typology factors and comparable ranges or categories for each factor, e.g. lowland, low alkalinity, shallow lakes. The intercalibration process is now completed for most of the biological quality elements in rivers and lakes (EC, 2013 and EC-JRC, 2014).

The common IC types are listed for each geographical intercalibration region (GIG) and water category in the IC Official Intercalibration Decision document (EC, 2013).

Table 3.3 Typology factors used to define the common intercalibration (IC) types for each of the geographical intercalibration groups (GIGs).

Lakes	GIGs				
Typology factors	Alpine	Central Baltic	Eastern continental*	Mediterranean	Northern
Alkalinity	x	x		x	x
Altitude	x	x		x	x
Annual precipitation				x	
Catchment area				x	
Lake area	x			x	
Mean depth	x	x		x	x
Organic material (Colour)					x
Residence time		x			

Rivers	GIGs					
Typology factors	Alpine	Central Baltic	Eastern continental	Mediterranean	Northern	All - very large rivers
Alkalinity	x	x			x	x
Altitude			x			
Altitude and geomorphology	x	x			x	
Catchment area	x	x	x	x	x	x
Ecoregion			x			
Flow regime	x			x		
Geology			x	x		
Organic material (colour)					x	
Substrate			x			

Notes: For lakes, the Eastern Continental GIG did not complete intercalibration, so no information is available on typology factors for IC types.

Source: EC, 2013.

In 2012 the reporting of the links between the national WFD types and the IC types were analysed, using the WISE WFD database. Only 22% of the national WFD types were reported by Member States to be linked to any of the IC types for both rivers and lakes (table 3.4). Many Member States did not report any links to IC types at all.

The consequences of the large number of national types not being linked to the IC types should be further considered in dialogue with Member States, the EC and EEA, especially concerning the implications for the translation of IC results on good ecological status class boundaries for the IC common types to national types and for the comparability of assessments of ecological status between Member States.

Table 3.4 Number of national WFD types with links to Intercalibration (IC) types.

Rivers	
IC type	number of national types
R-A1	49
R-A2	57
R-C1	15
R-C2	5
R-C3	70
R-C4	47
R-C5	29
R-C6	10
R-E1	4
R-E3	5
R-E4	3
R-M1	15
R-M2	15
R-M3	2
R-M4	15
R-M5	7
R-N1	1
R-N3	3
R-N4	2
Sum	354
Total	1599
% linked	22 %

Lakes	
IC type	number of national types
L-A1/2	4
L-AL3	10
L-AL4	7
L-CB1	35
L-CB2	41
L-CB3	15
L-M5/7	8
L-M8	12
L-N1	3
L-N2a	3
L-N2b	1
L-N3a	4
L-N5a	1
L-N6a	1
L-N8a	4
Sum	149
Total	673
% linked	22 %

Source: WISE-WFD database 2012 (extract from the SWB_SCHEMA).

3.1.3 Freshwater Habitat types from the Habitats Directive

The aim of the Habitats Directive (HD) is to protect certain habitats and species (identified in HD). The habitats listed in the HD related to freshwater are divided into standing water habitats and running water habitats corresponding to the WFD lakes and rivers water categories respectively (Table 3.5). There are also other habitat types in the HD related to wetlands, riparian forest or flood plains. Those habitat types are important to consider in river basin management plans under the WFD, as well as for flood risk management plans under the Floods Directive, due to their capacity to retain water and pollutants, and to protect biodiversity (Natural Water Retention Measures web-site, European Commission web-site for the Blueprint to safeguard Europe's water resources). However, those types are not included in this cross-walk of types between the HD and the WFD, because there is no corresponding water category for wetlands or floodplains and thus no corresponding types of water bodies defined in the WFD.

Many of the freshwater HD habitats related to standing and running waters are defined by the vegetation associated with the water bodies, as evident by their titles (Table 3.5). A longer list of typically associated vegetation can be found in EC 2007. Some abiotic information regarding altitude and/or natural trophic status can be extracted from the names of the HD habitat type names. Botanical expertise (Marit Mjelde, researcher at NIVA) has provided additional information regarding the environmental requirements of the indicator plants that are used to characterize the different freshwater habitats, especially their calcium or alkalinity requirements. Such information was needed to consider similarities of the freshwater habitats with the WFD common Intercalibration types and with the broad types identified in the chapter above.

The HD includes some very broadly defined habitat types, e.g. “3260 Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation” and “3210 Fennoscandian natural rivers”. But the HD also uses very narrowly defined habitat types that refers to a single or a few lakes, e.g. “31A0 Transylvanian hot-springs lotus beds” (mainly Petea lake in Romania). Evans (2006) discusses the habitat type definitions of the EU Habitats Directive and identifies several problems, particularly with identifying the habitats in the field, and the absence of information on habitat distribution, but also poorly defined and sometimes overlapping habitat types. “The ‘Standing waters’ group of habitat types is particularly complex, with both priority subtypes of wider habitats and similar vegetation in two or more habitat types, but separated by substrate and/or water quality” – Evans (2006).

Table 3.5 Natural freshwater habitat types of the Habitats Directive.

31. Standing water	
3110	Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*)
3120	Oligotrophic waters containing very few minerals generally on sandy soils of the West Mediterranean, with *Isoetes* spp.
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.
3150	Natural eutrophic lakes with *Magnopotamion* or *Hydrocharition* — type vegetation
3160	Natural dystrophic lakes and ponds
3170 *	Mediterranean temporary ponds
3180 *	Turloughs
3190	Lakes of gypsum karst
31A0 *	Transylvanian hot-spring lotus beds

32. Running water — sections of water courses with natural or semi-natural dynamics (minor, average and major beds) where the water quality shows no significant deterioration	
3210	Fennoscandian natural rivers
3220	Alpine rivers and the herbaceous vegetation along their banks
3230	Alpine rivers and their ligneous vegetation with *Myricaria germanica*
3240	Alpine rivers and their ligneous vegetation with *Salix elaeagnos*
3250	Constantly flowing Mediterranean rivers with *Glaucium flavum*
3260	Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation
3270	Rivers with muddy banks with *Chenopodion rubri* p.p. and *Bidention* p.p. vegetation
3280	Constantly flowing Mediterranean rivers with *Paspalo-Agrostidion* species and hanging curtains of *Salix* and *Populus alba*
3290	Intermittently flowing Mediterranean rivers of the *Paspalo-Agrostidion*
32A0	Tufa cascades of karstic rivers of the Dinaric Alps

Note: The numbers correspond to the NATURA 2000 code. * indicates priority habitat types.
Source: Habitats Directive

EU Member States have reported information for Natura 2000 sites on approximately 6600 river habitats (running waters) and 9200 lake habitats (standing waters) to the Natura 2000 database (Table 3.6). More than half of the river habitats belong to the type 3260 Water courses of plain to montane levels, making it difficult to represent the variety of different river types by this very broad river habitat type. For standing waters (lakes and ponds) the most common habitats are the natural eutrophic lakes (3150), two types of oligo-mesotrophic lakes (3130 soft-water lakes and 3140 hardwater lakes) and the Natural dystrophic lakes and ponds (3160). These four habitat types represent almost 90% of all the standing water habitats reported.

Table 3.6 River and lake habitats reported by the EU Member States.

Rivers – running waters	**6564 habitats**
Water courses of plain to montane levels	3860 (59 %)
Three Alpine river habitat types	1060 (16 %)
Three Mediterranean river habitat types	772 (12 %)
Rivers with muddy banks	691 (11%)
Fennoscandian natural rivers	181 (3 %)

Lakes – standing waters	**9186 habitats**
Natural eutrophic lakes	3481 (38 %)
Two oligotrophic to mesotrophic lake habitat types	2449 (27 %)
Natural dystrophic lakes and ponds	2144 (23 %)
Two oligotrophic lake habitat types	528 (6 %)
Mediterranean temporary ponds	495 (5 %)
Turloughs	73 (1 %)
Lakes of gypsum karst	15 (0.2 %)

Source: Natura 2000 database 2012, available at: http://www.eea.europa.eu/data-and-maps/data/natura-4

Also within countries the distribution of habitat types are very uneven, e.g. in Denmark, where all of the river habitats reported in both the Continental and Atlantic biogeographic regions are defined as type 3260 Water courses of plain to montane levels (ETC-BD, 2013).

3.1.4 Freshwater habitat types of the EUNIS habitats classification

The European Nature Information System (EUNIS) classification is a comprehensive hierarchical classification of European habitats. In contrast, HD habitat types are only a selection of a few habitat-types which are considered of major European interest. The EUNIS habitat classification includes several freshwater habitat types (table 3.7).

Table 3.7 EUNIS river and lake habitats at levels 1, 2 & 3

C: Inland surface waters		
C1: Surface standing waters		
	C1.1	Permanent oligotrophic lakes, ponds and pools
	C1.2	Permanent mesotrophic lakes, ponds and pools
	C1.3	Permanent eutrophic lakes, ponds and pools
	C1.4	Permanent dystrophic lakes, ponds and pools
	C1.5	Permanent inland saline and brackish lakes, ponds and pools
	C1.6	Temporary lakes, ponds and pools
	C1.7	Permanent lake ice
C2: Surface running waters		
	C2.1	Springs, spring brooks and geysirs
	C2.2	Permanent, non-tidal fast, turbulent watercourses
	C2.3	Permanent, non-tidal, smooth-flowing watercourses
	C2.4	Tidal rivers, upstream from estuary
	C2.5	Temporary running waters
	C2.6	Films of water flowing over rocky watercourse margins

Source: EUNIS habitat type hierarchical view available at: http://eunis.eea.europa.eu/habitats-code-browser.jsp?expand=C,C2,C1,C1.1#level_C1.1

3.2 Broad types of rivers and lakes for comparison of WFD and HD types

The first step needed in the cross-walk between the WFD and the HD is to define broad types that can allow comparison of national WFD types of lakes and rivers with HD habitat types for standing and running waters. The broad types can then be used to aggregate information on status and pressures/threats reported by Member States under the two directives for water bodies in national WFD types or for freshwater habitat types respectively.

Various approaches have been used to identify these broad types, including a conceptual preliminary identification, a top-down approach using the European catchments and rivers network system (ECRINS) and GIS-related information and a bottom-up approach using similarity between national types and the links to the WFD Intercalibration common types (IC types). These are presented below.

Additional aspects of the type comparisons include heavily modified and artificial water bodies and small water bodies. These aspects are briefly presented in the last part of this chapter.

3.2.1 Conceptual preliminary identification of broad types

For the conceptual preliminary identification of broad types of rivers, the starting point was the main natural factors known to affect the structure of freshwater biological communities (e.g. climate, altitude, size, geology). These typology factors are also used by the majority of EU Member States and Norway to identify their national types (see section 3.1.1. in this report) and the common intercalibration types (see section 3.1.2 in this report), as well as being fundamental for the definition of the biogeographic regions and many of the HD freshwater habitat types (see section 3.1.3 in this report and also EC, 2007). These considerations resulted in three major climatic/altitude regions for Northern/Central Europe: lowland, mid-altitude, highland and a fourth region for the Mediterranean (regardless of altitude) (Table 3.8). The links of these four main regions to the biogeographical regions used in the HD are indicated in the left column of Table 3.8. Within each of these, the broad types differ by size and geology, and also by river flow for Mediterranean rivers.

Although theoretically all pressure and impact types could occur in each of the four climatic/biogeographic regions, there are differences among the dominant pressures in the different regions (EEA, 2012). The Mediterranean region is the region that is most affected by water abstraction and water storage, due to the much warmer and drier climate than in the rest of Europe. This does not mean that the Mediterranean region is not affected by other pressures, e.g. pollution from agriculture and urban waste water and hydromorphological modifications. The highland or Alpine biogeographic region generally has less pressures, but hydromorphological pressures from hydropower production can be a significant pressure in that region (see also chapter 4). The lowland regions of Europe, in particular within the Continental, Atlantic and Pannonian biogeographical regions, but also the Southern part of the Boreal regions, are most affected by pressures from agriculture and urban areas, causing both enrichment of nutrients and organic matter, but also a range of hydromorphological pressures.

Table 3.8 Conceptual preliminary identification of broad types of a) rivers and b) lakes and their main pressures and impacts.

a) Rivers

Climatic/ Biogeographical regions	Size and Geology	Main pressures/impacts
Lowland (Biogeographic regions: Continental, Atlantic, Pannonian, parts of Boreal, Steppic)	Large-very large, mixed geology	Diffuse pollution – (Agricultural), point pollution – urban / eutrophication and organic enrichment, HyMo / altered habitats (flood defense dams, locks, weirs, barriers, channelization), Water abstraction (water supply and irrigation) Other Pressures: (land drainage, introduced species, climate change)
	Small-medium, siliceous geology	
	Small-medium, calcareous or mixed geology	
	Small-medium, organic (peat) geology	
Mid-altitude (Biogeographic regions: parts of Boreal, Atlantic, Continental, Pannonian)	Small-medium, siliceous geology	HyMo / altered habitats (hydroelectric dam, water supply reservoir, flood defense dams, water flow regulations, hydropeaking, diversions /interbasin flow transfer, barriers) Diffuse pollution – (Agricultural), point pollution – urban / eutrophication and organic enrichment,
	Small-medium, calcareous or mixed geology	
	Small-medium, organic (peat) geology geology	
Highland (Upland) (Biogeographical region: Alpine)	Small-medium, siliceous geology	HyMo / altered habitats (hydroelectric dam, weirs, water flow regulations, hydropeaking, diversions /interbasin flow transfer, barriers) Acidification (Northern mainly)
	Small, calcareous or mixed geology	
Mediterranean (Biogeographic region: Mediterranean)	Lowland, perennial flow, small-large, mostly calcareous/mixed geology	Water abstraction /WS&D, (water supply and irrigation), HyMo / altered habitats (hydroelectric dam, water supply reservoir, flood defense dams, water flow regulations, diversions, barriers, weirs, channelisation) Point and diffuse pollution / eutrophication and organic enrichment Other Pressures: (introduced species, climate change)
	Mid-altitude, perennial flow, small-large, mixed geology	
	Very small-small, temporary/intermittent flow, mixed geology	

b) Lakes

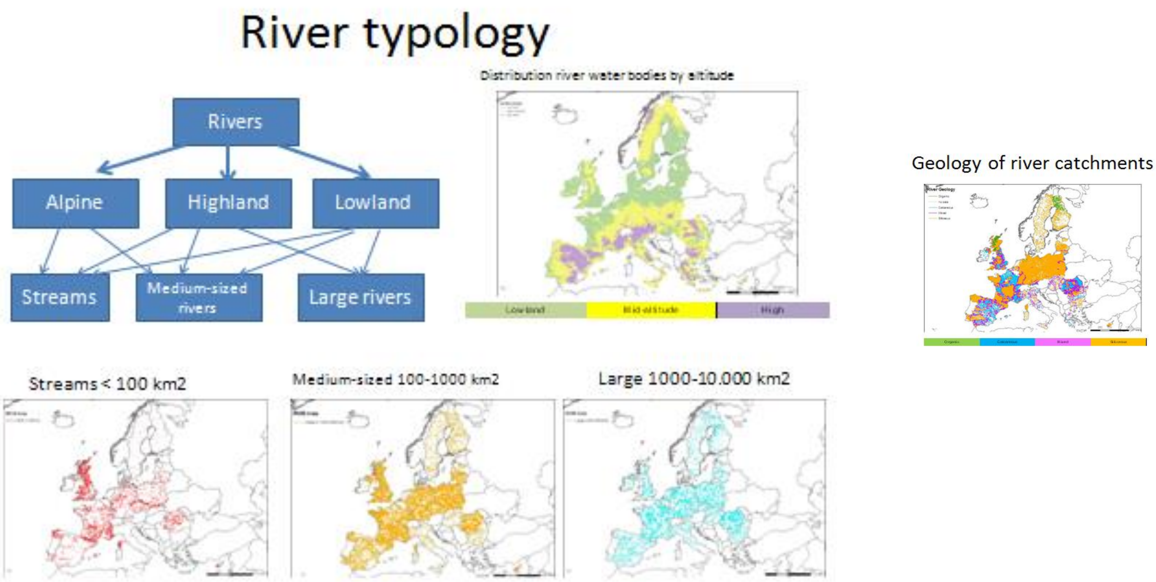
Climatic/ Biogeographical regions	Size and Geology	Main pressures/impacts
Lowland (Biogeographic regions: Continental, Atlantic, Pannonian, parts of Boreal, Steppic)	Large-very large, mixed geology	Diffuse pollution – (Agricultural), point pollution – urban / eutrophication and organic enrichment, HyMo / altered habitats (flood defense dams, locks, weirs, barriers, channelization), Water abstraction (water supply and irrigation) Other Pressures: (land drainage, introduced species, climate change)
	Small-medium, siliceous geology	
	Small-medium, calcareous or mixed geology	
	Small-medium, organic (peat) geology	
Mid-altitude (Biogeographic regions: parts of Boreal, Atlantic, Continental, Pannonian)	Small-medium, siliceous geology	HyMo / altered habitats (hydroelectric dam, water supply reservoir, flood defense dams, water flow regulations, hydropeaking, diversions /interbasin flow transfer, barriers) Diffuse pollution – (Agricultural), point pollution – urban / eutrophication and organic enrichment,
	Small-medium, calcareous or mixed geology	
	Small-medium, organic (peat) geology geology	
Highland (Upland) (Biogeographical region: Alpine)	Small-medium, siliceous geology	HyMo / altered habitats (hydroelectric dam, weirs, water flow regulations, hydropeaking, diversions /interbasin flow transfer, barriers) Acidification (Northern mainly)
	Small, calcareous or mixed geology	
Mediterranean (Biogeographic region: Mediterranean)	Lowland, perennial flow, small-large, mostly calcareous/mixed geology	Water abstraction /WS&D, (water supply and irrigation), HyMo / altered habitats (hydroelectric dam, water supply reservoir, flood defense dams, water flow regulations, diversions, barriers, weirs, channelisation) Point and diffuse pollution / eutrophication and organic enrichment Other Pressures: (introduced species, climate change)
	Mid-altitude, perennial flow, small-large, mixed geology	
	Very small-small, temporary/intermittent flow, mixed geology	

Notes: Broad types are based on the WFD most commonly used typology factors and pressure categories. The pressures are sorted from the most important to least important within each main region. HyMo: Hydromorphology; WS&D: Water Scarcity and drought. See text for further explanation.

3.2.2 Top-down identification of broad river types using ECRINS

By using the European Catchments and Rivers Network System (ECRINS) as a geospatial reference, information on altitude, size of catchment, geology and ecoregion was attached to each river water body. The rivers of Europe could then be aggregated into 25 broad types (Nixon et al. 2012). The 15 most common of these broad river types are tabulated in table 3.9 and shown on maps (see the small maps in Figure 3.1). A similar top-down approach for lakes was not feasible.

Figure 3.1 Top-down approach to characterize the WFD river water bodies according to altitude, size of catchment and geology of catchment.



Source: Nixon et al. 2012.

Table 3.9 The 15 most common river types identified by the ECRINS approach, including size, altitude and geology

Broad type	Broad type description (from ECRINS approach)
1	Small, lowland, siliceous
2	Medium, lowland, siliceous
3	Large, lowland, siliceous
25	Small, lowland, calcareous
26	Medium, lowland, calcareous
5	Small, mid-altitude, siliceous
6	Medium, mid-altitude, siliceous
7	Large, mid-altitude, siliceous
29	Small, mid-altitude, calcareous
30	Medium, mid-altitude, calcareous
18	Medium, mid-altitude, mixed
9	Small, upland, siliceous
10	Medium, upland, siliceous
11	Large, upland, siliceous
33	Small, upland, calcareous

Note: The numbers on the left are type numbers for 15 of the 25 broad river types reported by Nixon et al. 2012.

Source: Nixon et al. 2012, Kristensen 2013.

3.2.3 Broad types identification using groups of related national WFD types

Approach

To link the national WFD types of lakes and rivers to a limited number of broad types, there was a need to request more information from the EU Member States (and Norway) on the actual categories applied for each typology factor. This information was requested and provided from the Member States and Norway to the ETC-ICM through an iterative process linked to the WFD-CIS WG ECOSTAT and facilitated by JRC and DG Environment. The countries have also influenced the definition of broad types by requesting modifications of the first set of broad types proposed by the ETC-ICM. This process is important for acceptance of the broad types in the countries and to allow a high proportion of all national types and water bodies to be aggregated to a broad type. The dialogue with the countries during the past two years has provided sufficient information to include almost all countries in the analysis and to capture the large majority of water bodies and national types and aggregate them into a limited number of broad types.

The national types were grouped into broad types based on similarity between the type ranges for the most commonly used typology factors (Lyche-Solheim et al. 2012). The links given by Member States to the Intercalibration (IC) common types were also used to sort some of the national types into the broad types. Many Member States use the typology System B in the WFD Annex II for their national typologies, selecting various typology factors and defining their own ranges for each factor. In spite of these highly variable national typologies, a large part of the numeric information reported by the countries to the ETC-ICM upon the WFD-CIS WG ECOSTAT request could be translated to the categories of size, altitude and geology defined in the typology System A in the WFD Annex II. To translate the geology categories to the alkalinity ranges we used the following rules: alkalinity < 1 mekv/l (or Calcium < 20 mg/l) represents siliceous geology, alkalinity > 1 mekv/l (or Calcium > 20 mg/l) represents calcareous geology, national types with alkalinities ranging from <1 to > 1 mekv/l represents mixed geology. Colour > 30 mg Pt/l are humic lakes or rivers representing organic or peaty geology. Sometimes the geology was only described in words, e.g. sedimentary rocks (assumed to be calcareous) or granite dominated catchment (assumed to be siliceous). In such cases geological expert knowledge was consulted to assess the “correct” geological category.

Altitude and geology are important to distinguish both pressures, status and reference conditions. However, for both rivers and lakes, the calcareous and mixed geology categories were merged, assuming comparable biology and vulnerability to eutrophication. National types with very large rivers or lakes were included even if the proportion of water bodies was quite small. Mediterranean national types for very small lakes and temporary streams were included, even if information on other key typology factors was missing, because they are more vulnerable to pressures than larger water bodies. Highland rivers were not split by size as they have smaller ranges of catchment size than what is found for lowland and mid-altitude rivers. A broad type for glacial rivers was introduced, as this was requested by the Alpine countries, allowing aggregation of all national types for glacial rivers.

For lakes depth, the most important ecological distinction is whether the lake is stratified or not. This is especially relevant for lowland lakes responding to eutrophication. This is why the lowland calcareous or mixed lakes are split into very shallow (non-stratified or polymictic) and shallow lakes (stratified or dimictic), matching the intercalibration (IC) types L-CB2 and L-CB1 respectively (EC, 2013). For lakes in mid-altitude or highland areas, most of the national types are stratified, so there is less need to split these types into depth categories.

For some of the national types, the link to a broad type is considered by the Member State to be valid for the majority of water bodies belonging to that national type, but not for all the water bodies of that type. These national types are primarily river types indicated at the end of Annex 3a.

The overview of the typology factors and categories for each factor applied in the definition of broad types is given in table 3.10.

Table 3.10 Numeric ranges applied for each of the most commonly used typology factors used to define the broad types.

RIVERS

Type factor	Categories	Codes	Range
Altitude	lowland	1	< 200 masl
	mid-altitude	2	200-800 masl
	highland	3	> 800 masl

Type factor	Categories	Codes	Range
Catchment size	very small	1	< 10 km^2
	small	2	10-100 km^2
	medium	3	100-1000 km^2
	large	4	1000-10000 km^2
	very large	5	>10000 km^2

Type factor	Categories	Codes	Alkalinity	Ca	Colour	Bedrock or deposits
Geology	Siliceous	1	< 1 mEq/L	< 20 mg/L	< 30 mg Pt/L	crystalline, granite, gneiss
	Calcareous	2	> 1 mEq/L	> 20 mg/L	< 30 mg Pt/L	sedimentary, calcite, carbonaceous
	Organic /Humic	3	any	any	> 30 mg Pt/L	peat
	Mixed	4	any	any	any	any mixture

LAKES

Type factor	Categories	Codes	Range
Altitude	lowland	1	< 200 masl
	mid-altitude	2	200-800 masl
	highland	3	> 800 masl

Type factor	Categories	Codes	Range
Surface area	very small	1	< 0,5 km^2
	small	2	0,5-1 km^2
	medium	3	1-10 km^2
	large	4	10-100 km^2
	very large	5	>100 km^2

Type factor	Categories	Codes	Alkalinity	Ca	Colour	Bedrock or deposits
Geology	Siliceous	1	< 1 mEq/L	< 20 mg/L	< 30 mg Pt/L	crystalline, granite, gneiss
	Calcareous	2	> 1 mEq/L	> 20 mg/L	< 30 mg Pt/L	sedimentary, calcite, carbonaceous
	Organic /Humic	3	any	any	> 30 mg Pt/L	peat
	Mixed	4	any	any	any	any mixture

Type factor	Categories	Codes	Range	Stratification	Mixing
Mean depth	very shallow	1	< 3 m	non-stratified	polymictic
	shallow	2	3-15 m	stratified	dimictic
	deep	3	> 15 m	stratified	dimictic

Notes: The codes for each of the numeric ranges and each typology factor (altitude, size, geology and depth) are used to describe and link each national type to a broad type (see Annexes 2and 3).

Denmark has been excluded from the analysis due to their withdrawal of the 1st RBMP's. The revised adopted RBMPs were resubmitted in late October 2014, but this happened too late to re-include Denmark in the analysis. Spain was also excluded from the analysis after a request from Spanish WFD authorities, due to their use of typology factors in the WFD, Annex II, System B that did not match the System A factors and ranges used to define the broad types. This mismatch caused a large overlap between many of the Spanish national types with several broad types, in particular for rivers. Further discussions are needed with Denmark and Spain to allow integration of at least some of their national types into the broad types for future assessments.

Mediterranean types were separated from the rest of Europe due to a different climate and more pressures from water scarcity and droughts. However, several Mediterranean countries requested that their highland rivers were merged with other highland river types from the rest of Europe, as they are very different from other Mediterranean types. Most of the Mediterranean countries also requested the broad river types for that region to be split into perennial/continuous flow rivers and temporary/intermittent rivers, as river flow is fundamental both for reference conditions, as well as for ecological response to pressures.

Heavily modified and artificial water bodies are usually not distinguished as separate types, but are integrated with natural water bodies having comparable typology factors and ranges for each factor. Some countries have reported reservoirs as rivers, thus these may appear among the river types, although they have probably been classified as lakes.

In many cases the numeric ranges given by a country deviated from these general categories. If the actual range for a typology factor given by the Member State was predominantly within the range given for one of the categories in table 3.10, then that type was linked to that category. On the contrary, national types were excluded from further analysis if the actual range for a typology factor was overlapping several of the categories given in table 3.10, e.g. if the altitude for a national river type is spanning the range 0-2500 masl. The same basic approach was used to translate the catchment size information or lake depth information to one of the different type factor categories, or to exclude a national type from further analysis due to major overlap with several of the broad types.

To link as many national types to the broad types as possible, the altitude ranges given in table 3.10 were used with flexibility, taking into account the change in tree line with latitude in Europe. For example if a national type from a Mediterranean country ranges from 500-1000 masl, this was assessed as mid-altitude and not as highland, due to the higher tree line in Mediterranean countries than in Central and Northern Europe.

Broad types for Rivers

The ecologically most relevant combinations of these typology factors gave 20 broad river types. The justification for defining these broad types is based on a combination of ecological considerations, feedback from the countries and the pragmatic need to limit the number of broad types to be used for meaningful EU-level assessments of status and pressures.

The links between the national river types and the broad river types are given in Annexes 2a and 3a.

Altogether 575 national river types from 26 countries could be linked to one of the 20 broad types (Tables 3.11, 3.12 and Annexes 2 and 3). The proportion of river water bodies included in these national types comprises 87% of all river water bodies in the countries that could be included in the analysis, including natural rivers, as well as heavily modified and artificial water bodies (HMWBs and AWBs). Notes with special issues for some countries are given at the end of the river types in Annex 3a.

Table 3.11 Broad river types based on the most commonly used typology factors for WFD national types.

Broad river type name	Broad river type code	Altitude (masl)	Lake area (km^2)	Geology	Number of national types	Number of WBs	% of WBs
Very large rivers (all Europe)	1	any	>10 000	any (usually mixed)	54	827	1.0 %
Lowland, Siliceous, Medium-Large	2	<200	100 - 10 000	Siliceous	24	1139	1.4 %
Lowland, Siliceous, Very small-Small	3	<200	<100	Siliceous	29	7285	8.8 %
Lowland, Calcareous or Mixed, Medium-Large	4	<200	100 - 10 000	Calcareous/Mixed	68	2873	3.5 %
Lowland, Calcareous or Mixed, Very small-Small	5	<200	<100	Calcareous/Mixed	47	14137	17.1 %
Lowland, Organic and Siliceous	6	<200	<10 000	Organic and Siliceous	18	6193	7.5 %
Lowland, Organic and Calcareous/Mixed	7	<200	<10 000	Organic and Calcareous/Mixed	10	353	0.4 %
Mid altitude, Siliceous, Medium-Large	8	200 - 800	100 - 10 000	Siliceous	41	3051	3.7 %
Mid altitude, Siliceous, Very small-Small	9	200 - 800	<100	Siliceous	37	8627	10.5 %
Mid altitude, Calcareous or Mixed, Medium-Large	10	200 - 800	100 - 10 000	Calcareous/Mixed	60	1796	2.2 %
Mid altitude, Calcareous or Mixed, Very small-Small	11	200 - 800	<100	Calcareous/Mixed	48	7663	9.3 %
Mid-altitude, Organic and siliceous	12	200 - 800	<10 000	Organic and Siliceous	8	3290	4.0 %
Mid-altitude, Organic and Calcareous/Mixed	13	200 - 800	<10 000	Organic and Calcareous/Mixed	6	154	0.2 %
Highland (all Europe), Siliceous, incl. Organic (humic)	14	>800	<10 000	Siliceous	16	1525	1.8 %
Highland (all Europe), Calcareous/Mixed	15	>800	<10 000	Calcareous/Mixed	17	2227	2.7 %
Glacial rivers (all Europe)	16	> 200	<10 000	any	16	3251	3.9 %
Mediterranean, Lowland, Medium-Large, perennial	17	<200	100 - 10 000	any	16	941	1.1 %
Mediterranean, Mid altitude, Medium-Large, perennial	18	200 - 800	100 - 10 000	any	13	615	0.7 %
Mediterranean, Very small-Small, perennial	19	< 800	<100	any	21	1942	2.4 %
Mediterranean, Temporary/Intermittent streams	20	any	<1 000	any	26	3549	4.3 %
				Total	**575**	**71438**	**86.6 %**

Note: WBs is waterbodies, "% of WBs" is % of WBs in all Member States included in the analysis of national WFD types.

Table 3.12 Number of river water bodies from each Member State (and Norway) allocated to each of the broad River types.

Country	1 - Very large rivers (all Europe)	2 - Lowland, Siliceous, Medium-Large	3 - Lowland, Siliceous, Very small-Small	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	8 - Mid altitude, Siliceous, Medium-Large	9 - Mid altitude, Siliceous, Very small-Small	10 - Mid altitude, Calcareous or Mixed, Medium-Large	11 - Mid altitude, Calcareous or Mixed, Very small-Small	12 - Mid-altitude, Organic and siliceous	13 - Mid-altitude, Organic and Calcareous/Mixed	14 - Highland (all Europe), Siliceous, incl. Organic (humic)	15 - Highland (all Europe), Calcareous/Mixed	16 - Glacial rivers (all Europe)	17 - Mediterranean, Lowland, Medium-Large, perennial	18 - Mediterranean, Mid altitude, Medium-Large, perennial	19 - Mediterranean, Very small-Small, perennial	20 - Mediterranean, Temporary/Intermittent streams	∑
AT	472			25				424	448	852	1454				863	2248					**6786**
BE (Fl)	1	60	91																		**152**
BE (W)	2			18	66			16	89	24	104	8									**327**
BG		8		73																	**81**
CY															17					199	**216**
CZ	16	39	20	17	20			301	435	46	140			9							**1043**
DE	95			393	2472			240	1616	258	863				71						**6008**
EE	4			127	513																**644**
EL																	433	365	53		**851**
FI	23	275	151			813				9			1								**1272**
FR	74	259	768	580	2265			354	490	42	729			577	576	673	16	71	840		**8314**
HR	9		6	70	595					22	167						11	8	107		**995**
HU	21			99	135				28	147	209										**639**
IE			1815		2708																**4523**
IT				64	267			32	571		1021			29		330	122	171	436	1838	**4881**
LT				243	589																**832**
LU				13	47			11	36												**107**
LV				200	4																**204**
NL	11				210																**221**
NO																					
PL	75		2091	271	295	314		35	424	46	376		98	4	2						**4031**
PT	8																359		506	455	**1328**
RO	7			85	156					58	1259									1056	**2621**
SE		393	858	56	106	4920	353	1367	3064	104	77	3282	55	901	11						**15547**
SI	4																			1	**5**
SK	5			47	259					76	652				687						**1726**
UK		105	1485	492	3430	146		271	1426	112	612			5							**8084**
∑	**827**	**1139**	**7285**	**2873**	**14137**	**6193**	**353**	**3051**	**8627**	**1796**	**7663**	**3290**	**154**	**1525**	**2227**	**3251**	**941**	**615**	**1942**	**3549**	**71438**

Note: Country abbreviations are explained in the glossary (Annex 1).

Broad types for Lakes

The ecologically most relevant combinations of these typology factors gave 15 broad lake types. The justification for defining these broad types is based on a combination of ecological considerations, feedback from the countries and the pragmatic need to limit the number of broad types to be used for meaningful EU-level assessments of status and pressures.

Altogether 295 national lake types from 24 countries could be linked to one of the 15 broad lake types (Tables 3.13, 3.14 and Annexes 2b and 3b). The proportion of lake water bodies included in these national types comprises 74% of all lake water bodies in the countries that could be included in the analysis, including natural lakes, as well as reservoirs (heavily modified water bodies (HMWBs) and artificial water bodies (AWBs)).

Table 3.13 Broad lake types based on the most commonly used typology factors for WFD national types.

Broad lake type name	Broad Lake type code	Altitude (masl)	Lake area (km^2)	Geology	Mean depth (m)	Stratification	Number of national types	Number of WBs	% of WBs
Very large lakes, shallow or deep and stratified (all Europe)	1	any	>100	any	> 3	stratified	6	126	0.7 %
Lowland, Siliceous	2	<200	<100	Siliceous	>3	stratified	34	2059	12.0 %
Lowland, Stratified, Calcareous/Mixed	3	<200	<100	Calcareous/Mixed	>3	stratified	41	1721	10.1 %
Lowland, Calcareous/Mixed, Very shallow/unstratified	4	<200	<100	Calcareous/Mixed	≤3	unstratified	39	1045	6.1 %
Lowland Organic (humic) and Siliceous	5	<200	<100	Organic (humic) and Siliceous	> 3	stratified	23	2275	13.3 %
Lowland Organic (humic) and Calcareous/Mixed	6	<200	<100	Organic (humic) and Calcareous/Mixed	>3	stratified	13	130	0.8 %
Mid altitude, Siliceous	7	200 - 800	<100	Siliceous	>3	stratified	43	2673	15.6 %
Mid altitude, Calcareous/Mixed	8	200 - 800	<100	Calcareous/Mixed	>3	stratified	27	281	1.6 %
Mid-altitude, Organic (humic) and Siliceous	9	200 - 800	<100	Organic (humic) and Siliceous	>3	stratified	11	1381	8.1 %
Mid-altitude, Organic (humic) and Calcareous/Mixed	10	200 - 800	<100	Organic (humic) and Calcareous/Mixed	>3	stratified	4	24	0.1 %
Highland, Siliceous (all Europe), incl. Organic (humic)	11	>800	<100	Siliceous	>3	stratified	15	539	3.1 %
Highland, Calcareous/Mixed (all Europe), incl. Organic (humic)	12	>800	<100	Calcareous/Mixed	>3	stratified	10	48	0.3 %
Mediterranean, small-large, siliceous	13	< 800	0.5-100	Siliceous	any	any	11	129	0.8 %
Mediterranean, small-large, Calcareous/Mixed	14	< 800	0.5-100	Calcareous/Mixed	any	any	13	121	0.7 %
Mediterranean, Very small	15	< 800	<0.5	any	<15	any	0	0	0.0 %
					Total		**290**	**12552**	**73.3 %**

Notes: WBs is waterbodies, "% of WBs" is % of WBs in all Member States included in the analysis of national WFD types. Many large lakes are split into smaller water bodies, and thus do not appear as large lakes

Table 3.14 Number of lake water bodies from each Member State (and Norway) allocated to each of the broad Lake types.

Country	1 - Very large lakes, shallow or deep and stratified (all Europe)	2 - Lowland, Siliceous	3 - Lowland, Stratified, Calcareous/Mixed	4 - Lowland, Calcareous/Mixed, Very shallow/unstratified	5 - Lowland Organic (humic) and Siliceous	6 - Lowland Organic (humic) and Calcareous/Mixed	7 - Mid altitude, Siliceous	8 - Mid altitude, Calcareous/Mixed	9 - Mid-altitude, Organic (humic) and Siliceous	10 - Mid-altitude, Organic (humic) and Calcareous/Mixed	11 - Highland, Siliceous (all Europe), incl. Organic (humic)	12 - Highland, Calcareous/Mixed (all Europe), incl. Organic (humic)	13 - Mediterranean, small-large, siliceous	14 - Mediterranean, small-large, Calcareous/Mixed	15 - Mediterranean, Very small	∑
AT	1			1			2	24				11				**39**
BE (Fl)			8	6												**14**
BG																
CY														11		**11**
CZ		1		3			62	5								**71**
DE			248				17	17								**282**
EE		1	26	33		6										**66**
EL												3	10	5		**18**
FI	112	618			578											**1308**
FR	1		79				14	158			20			14		**286**
HR								2						4		**6**
HU			36	1		8										**45**
IE		88	62	86			2									**238**
IT	12		26	12			4				48	21	12	87		**222**
LT			215	130												**345**
LV			161	60	11	13										**245**
NL			31	51		25										**107**
NO																
PL			498	296												**794**
PT													107			**107**
RO			5	43		52										**100**
SE		902	130	67	1669	26	2480	69	1379	23	471	13				**7229**
SI								2								**2**
UK		449	196	256	17		92	4	2	1						**1017**
∑	**126**	**2059**	**1721**	**1045**	**2275**	**130**	**2673**	**281**	**1381**	**24**	**539**	**48**	**129**	**121**		**12552**

Notes: Country abbreviations are explained in the glossary (Annex 1).

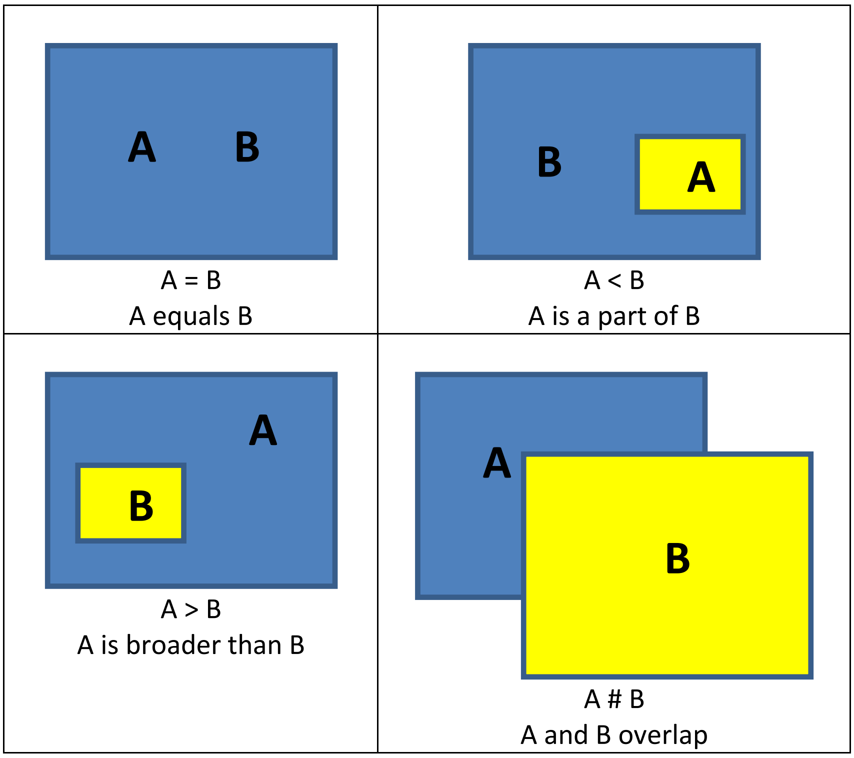
3.3 Linking the various types of the WFD and HD

3.3.1 Approach

Although there are many typologies for the WFD and HD/EUNIS, it is usually possible to derive links between them, often presented as tables and known as crosswalks (Evans and Gelabert, 2013). Unfortunately often the links are from many to many rather than one to one. These relationships can be described, and the EUNIS website uses a series of symbols as described in figure 3.2.

The 20 broad river types and the 15 broad lake types given in Tables 3.11 and 3.13 respectively were compared to the WFD common intercalibration types and with the two sets of river habitat types (defined by the Habitats Directive and by the EUNIS). For rivers, also the top-down defined broad types using ECRINS were included in the comparison. To match the habitat types for running waters to the broad river types, macrophyte expert knowledge was also consulted concerning the calcium (or bicarbonate) requirements of the key plant species characterizing the habitat types.

Figure 3.2 Possible relationships between different habitat classifications and the symbols used by EUNIS.



Source: Evans and Gelabert, 2013.

3.3.2 Results of the cross-walk on types

The links between the broad types defined in chapter 3.2.3, the broad ECRINS based types in chapter 3.2.2. (available for rivers only), the WFD common IC types in chapter 3.1.2 and the HD types in chapter 3.1.4, and EUNIS river habitats in chapter 3.1.5 are shown in table 3.15 and 3.16 below.

For rivers, the best match between the WFD and HD types was found for highland/Alpine types and for some Mediterranean types.

The two most common river habitats, the 3210 Fennoscandian natural rivers and the 3260 Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation are too wide in terms of altitude, geology and size to match any of the broad types nor any of the WFD common IC types. These habitats are also difficult to distinguish from each other in the Fennoscandian countries. Sweden has chosen a pragmatic approach by defining all their large rivers (average width 25 m) to habitat 3210, and their medium and smaller rivers (average width 10 m) to habitat 3260. See more information in the Swedish example in chapter 3. The non-matching habitats are shown in table 3.17.

Three of the EUNIS river habitat types C2.2, 2.3 and 2.5 are also quite unspecific in terms of geology and size, but are assumed to fit with some of the broad types based on flow characteristics of the main regions: Smooth-flowing rivers (C2.3) are assumed to be mostly found in the lowlands, while fast, turbulent watercourses (C2.2) are assumed to be mostly found in highland areas. Temporary running waters (C2.5) are assumed to match the HD 3290 Intermittently flowing Mediterranean rivers and with the WFD IC type R-M5 Temporary streams.

The EUNIS river habitat types C2.1 Springs, spring brooks and geysers, C2.4 Tidal rivers, upstream from the estuary and C2.6 Films of water flowing over rocky watercourse margins are quite specific narrow habitats that did not match any of the broad WFD types nor any of the HD habitat types (Table 3.17).

The cross-walk also illustrates that there is often not a one-to-one relationship between the types of the different typology systems, as some of the river habitat types do not have specific information on one or more of the commonly used typology factors of the WFD IC types or the new broad types.

For lakes, the main differences between the WFD and HD types are that the WFD types use geology often expressed as calcium or alkalinity, but does not say anything about natural trophic status, while the HD uses natural trophic status to characterize the freshwater habitats for standing waters, but does not say anything about the calcium or alkalinity (with the exception of the habitat 3140, hard oligo-mesotrophic waters and the habitat 3190, lakes of gypsum karst). As calcium and alkalinity are usually positively correlated with natural trophic status (Cardoso et al. 2007, Carvalho et al. 2008, Phillips et al. 2008), it is feasible to link many of the WFD broad types to the HD types. We have therefore assumed that the HD/EUNIS terminology oligotrophic, mesotrophic and eutrophic refers to natural trophic state, and that these trophic state terms match the WFD low, moderate and high alkalinity types, respectively. We also assume that naturally eutrophic lakes are mostly unstratified and very shallow (mean depth < 3m), while the oligo- and mesotrophic habitat types are deeper and mostly stratified (mean depth 3-15m or >15m using the WFD categories shallow and deep).

For lowland and mid-altitude lake types there is a relatively good match between types in all the typology systems. The HD and EUNIS habitat types do not indicate altitude, so they can also occur in both lowland and mid- altitude regions. For the highland broad types, there are no matching IC types. The WFD altitude factor is also partly a descriptor of natural trophic status, as the often thick soils in the lowlands are rich in minerals, whereas the highland areas often have thin soils with fewer minerals. Therefore, we assume that the WFD broad types for highland lakes mainly match one HD lake type, the 3110 Oligotrophic waters containing very few minerals of sandy plains and one EUNIS type C1.1. Permanent Oligotrophic lakes, ponds and pools. The Mediterranean broad lake types are also well matched across the IC-types and the HD/EUNIS habitats, although the IC types are only defined for large deep reservoirs, whereas the HD/EUNIS types represent small natural lakes and temporary ponds (Bagella et al. 2007). Such types of small lakes and ponds are relevant for birds. Some Natura 2000 sites designated under the Birds Directive may correspond to such type of habitats.

Some very specific and narrow lake habitat types did not match any of the broad types, nor any of the WFD IC types (Table 3.17). These are the HD types 31A0 Transylvanian hot springs lotus beds, 3180 Turloughs and 3190 Lakes of gypsum karst, and the EUNIS habitats C1.5 Permanent inland saline and brackish lakes, ponds and pools and C1.7 Permanent lake ice.

Table 3.15 Cross-walk table for European rivers comparing broad types defined from similarity of national types, the broad types defined using ECRINS, the WFD common intercalibration types, the Habitat Directive Running waters types and the EUNIS river habitat types.

<table>
<tr><th></th><th>Broad River types (bottom-up linking of national types)</th><th>Broad River types (top-down ECRINS)</th><th>EU common intercalibration types*</th><th>HD Habitat types for running waters</th><th>EUNIS Habitat types</th></tr>
<tr><td rowspan="17">Lowland</td><td rowspan="2">1. Very large rivers (all Europe)</td><td rowspan="2"></td><td>R-L1. Very large, low alkalinity rivers</td><td></td><td rowspan="17">C2.3 Permanent non-tidal, smooth-flowing watercourses</td></tr>
<tr><td>R-L2. Very large, medium to high alkalinity rivers</td><td></td></tr>
<tr><td rowspan="2">2. Lowland, Siliceous, Medium-Large</td><td>2. Lowland, Siliceous, Medium</td><td rowspan="2">R-N4. Medium, lowland, siliceous, moderate alkalinity</td><td rowspan="2"></td></tr>
<tr><td>3.Lowland, Siliceous, Large</td></tr>
<tr><td rowspan="3">3. Lowland, Siliceous, Very small-Small</td><td rowspan="3">1. Lowland, Siliceous, Small</td><td>R-C1. Small lowland, siliceous sand</td><td></td></tr>
<tr><td>R-C2. Small lowland, siliceous rock</td><td></td></tr>
<tr><td>R-N1. Small, lowland, siliceous, moderate alkalinity</td><td></td></tr>
<tr><td rowspan="5">4. Lowland, Calcareous or Mixed, Medium-Large</td><td rowspan="5">26. Lowland, Calcareous, Medium</td><td>R-E3. Plains: large, lowland (mixed)</td><td rowspan="10">3270 Rivers with muddy banks with Chenopodion rubri p.p. and Bidention p.p. vegetation</td></tr>
<tr><td>R-EX8. Balkan: small to medium sized, calcareous karst spring</td></tr>
<tr><td>R-C5. Large, lowland, mixed</td></tr>
<tr><td>R-C4. Medium, lowland, mixed</td></tr>
<tr><td>R-E2. Plains: medium-sized, lowland (mixed)</td></tr>
<tr><td rowspan="3">5. Lowland, Calcareous or Mixed, Very small-Small</td><td rowspan="3">25. Lowland, Calcareous, Small</td><td>R-C6. Small, lowland, calcareous</td></tr>
<tr><td>R-EX5. Plains: small lowland (mixed)</td></tr>
<tr><td>R-EX8. Balkan: small to medium sized, calcareous karst spring</td></tr>
<tr><td>6. Lowland, Organic and Siliceous</td><td></td><td>R-N3. Small/medium, lowland, organic, low alkalinity</td></tr>
<tr><td>7. Lowland, Organic and Calcareous/Mixed</td><td></td><td></td></tr>
</table>

Table 3.16 continued

	Broad River types	Broad River types (top-down ECRINS)	EU common intercalibration types*	HD Habitat types for running waters	EUNIS Habitat types
Mid-altitude	**8.** Mid-altitude, Siliceous, Medium-Large	6. Mid-altitude, Siliceous, Medium			
		7. Mid-altitude, Siliceous, Large			
	9. Mid-altitude, Siliceous, Very small-Small	5. Mid-altitude, Siliceous, Small	**R-C3.** Small, mid-altitude, siliceous		
			R-N5. Small, mid-altitude, siliceous, low alkalinity		
	10. Mid-altitude, Calcareous or Mixed, Medium-Large	30. Mid-altitude, Calcareous, Medium	**R-E4**. Plains: medium-sized, mid-altitude (mixed)		
			R-E1a. Carpathians: small to medium, mid-altitude (mixed)		
		18. Mid-altitude, Mixed, Medium	**R-E1b**. Carpathians: small to medium, mid-altitude (mixed)		
			R-EX4. Large, mid-altitude (mixed)		
	11. Mid-altitude, Calcareous or Mixed, Very small-Small	29. Mid-altitude, Calcareous, Small	**R-EX7.** Balkan: small, calcareous, mid-altitude		
			R-E1a. Carpathians: small to medium, mid-altitude (mixed)		
			R-E1b. Carpathians: small to medium, mid-altitude (mixed)		
			R-EX6. Plains: small, mid-altitude (mixed)		
	12. Mid-altitude, Organic and siliceous				
	13. Mid-altitude, Organic and Calcareous/Mixed				

Table 3.17 continued

<table>
<tr><th></th><th>Broad River types</th><th>Broad River types (top-down ECRINS)</th><th>EU common intercalibration types*</th><th>HD Habitat types for running waters</th><th>EUNIS Habitat types</th></tr>
<tr><td rowspan="6">Highland</td><td rowspan="3">14. Highland (all Europe), Siliceous</td><td>9. Upland, Siliceous, Small</td><td rowspan="3">R-A2. Small to medium, high altitude, siliceous</td><td rowspan="4">3220 Alpine rivers and the herbaceous vegetation along their banks
3230 Alpine rivers and their ligneous vegetation with Myricaria germanica
3240 Alpine rivers and their ligneous vegetation with Salix elaeagnos</td><td rowspan="5">C2.2 Permanent non-tidal, fast, turbulent watercourses</td></tr>
<tr><td>10. Upland, Siliceous, Medium</td></tr>
<tr><td>11. Upland, Siliceous, Large</td></tr>
<tr><td rowspan="2">15. Highland (all Europe), Calcareous/Mixed</td><td rowspan="2">33. Upland, Calcareous, Small</td><td>R-A1. Pre-alpine, small to medium, high altitude, calcareous</td></tr>
<tr><td>R-M4. Mediterranean mountain streams (non-silicious)</td><td></td></tr>
<tr><td>16. Glacial rivers (all Europe)</td><td></td><td></td><td></td><td></td></tr>
<tr><td rowspan="4">Mediterranean</td><td>17. Mediterranean, Lowland, Medium-Large, perennial</td><td></td><td rowspan="2">R-M2. Medium Mediterranean streams (mixed, except silicious)</td><td rowspan="3">3250 Constantly flowing Mediterranean rivers with Glaucium flavum
3280 Constantly flowing Mediterranean rivers with Paspalo-Agrostidion species and hanging curtains of Salix and Populus alba</td><td></td></tr>
<tr><td>18. Mediterranean, Mid-altitude, Medium-Large, perennial</td><td></td><td></td></tr>
<tr><td>19. Mediterranean, Very small-Small, perennial</td><td></td><td>R-M1. Small Mediterranean streams (mixed, except silicious)</td><td></td></tr>
<tr><td>20. Mediterranean, Temporary/Intermittent streams</td><td></td><td>R-M5. Temporary streams</td><td>3290 Intermittently flowing Mediterranean rivers of the Paspalo-Agrostidion</td><td>C2.5 Temporary running waters</td></tr>
</table>

Notes: * EU Common IC types: R = Rivers, L: Very large, cross-GIG, A: Alpine, C: Central/Baltic, E: Eastern continental, M: Mediterranean, N: Northern. The intercalibration common types are described in the IC Official Decision 2013 (EC, 2013).

Table 3.18 Cross-walk table for European lakes comparing broad types with WFD common intercalibration types, Habitat Directive Standing waters types and EUNIS lake habitat types.

	Broad Lake types	EU common intercalibration types*	HD Habitat types for standing waters	EUNIS Habitat types
Lowland	**1.** Very large and deep (stratified) (all Europe)	**L-AL3.** Lowland (or Mid-altitude), deep, moderate to high alkalinity (alpine influence), large		
		L-N2b. Lowland, deep, low alkalinity, clear		
	2. Lowland, Siliceous	**L-N2b**. Lowland, deep, low alkalinity, clear	**3110** Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae)	**C1.1** Permanent oligotrophic lakes, ponds and pools
		L-N2a. Lowland, shallow, low alkalinity, clear		
		L-N1. Lowland, shallow, moderate alkalinity, clear	**3130** Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojuncetea	
	3. Lowland, Calcareous/Mixed, Stratified,	**L-AL3.** Lowland (or Mid-altitude), deep, moderate to high alkalinity (alpine influence), large	**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
		L-CB1. Lowland, shallow, calcareous	**3140** Hard oligo-mesotrophic waters with benthic vegetation of Chara spp.	
	4. Lowland, Calcareous/Mixed, Very shallow/unstratified	**L-CB2**. Lowland, very shallow, calcareous	**3150** Natural eutrophic lakes with Magnopotamion or Hydrocharition — type vegetation	**C1.3** Permanent eutrophic lakes, ponds and pools
	5. Lowland Organic (humic) and Siliceous	**L-N3a**. Lowland, shallow, low alkalinity, meso-humic	**3160** Natural dystrophic lakes and ponds	**C1.4** Permanent dystrophic lakes, ponds and pools
		L-N8a. Lowland, shallow, moderate alkalinity, meso-humic		
	6. Lowland Organic (humic) and Calcareous/Mixed			

Table 3.16 continued

	Broad Lake types Revised	EU common intercalibration types*	HD Habitat types for Standing waters	EUNIS Habitat types
Mid-altitude	**7.** Mid-altitude, Siliceous	**L-N5.** Mid-altitude, shallow, low alkalinity, clear	**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	**L-AL4.** Mid-altitude, shallow, moderate to high alkalinity (alpine influence), large	**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
		L-AL3. Lowland or Mid-altitude, deep, moderate to high alkalinity (alpine influence), large	**3140** Hard oligo-mesotrophic waters with benthic vegetation of Chara spp.	
	9. Mid-altitude, Organic (humic) and Siliceous	**L-N6a.** Mid-altitude, shallow, low alkalinity, meso-humic	**3160** Natural dystrophic lakes and ponds	**C1.4** Permanent dystrophic lakes, ponds and pools
	10. Mid-altitude, Organic (humic) and Calcareous/Mixed			
Highland	**11.** Highland, Siliceous (all Europe)		**3110** Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae)	**C1.1** Permanent oligotrophic lakes, ponds and pools
	12. Highland, Calcareous/Mixed (all Europe)			**C1.2** Permanent mesotrophic lakes, ponds and pools
Mediterranean	**13.** Mediterranean, small-large, siliceous (incl. Reservoirs)	**L-M5/7**. Reservoirs, deep, large, siliceous, "wet areas"	**3120** Oligotrophic waters containing very few minerals generally on sandy soils of the West Mediterranean, with Isoetes spp.	**C1.1** Permanent oligotrophic lakes, ponds and pools
	14. Mediterranean, small-large, Calcareous/Mixed (incl. Reservoirs)	**L-M8**. Reservoirs, deep, large, calcareous		**C1.2** Permanent mesotrophic lakes, ponds and pools
	15. Mediterranean, Very small		**3170** Mediterranean temporary ponds	**C1.6** Temporary lakes, ponds and pools

Notes: * EU Common IC types: L = lakes, A: Alpine, C: Central/Baltic, E: Eastern continental, N: Northern, M: Mediterranean. The intercalibration common types are described in the IC Official Decision (EC, 2013).

Table 3.19 Non-matching HD and EUNIS freshwater habitat types. These habitats do not match any of the WFD IC types, nor any of the broad types of rivers and lakes.

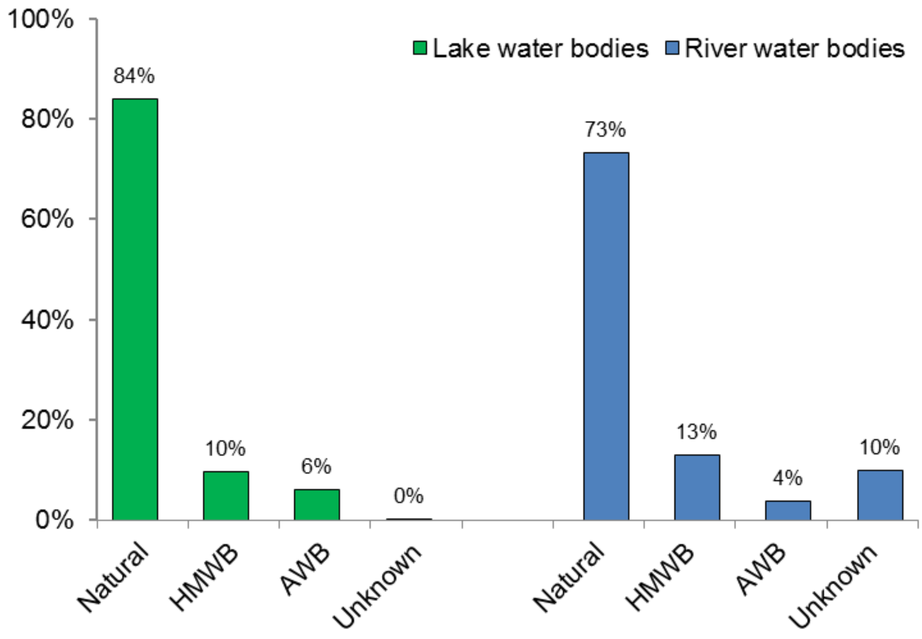
	HD Habitat types	EUNIS Habitat types
Rivers	**3210** Fennoscandian natural rivers	
	3260 Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation	
		C2.1 Springs, spring brooks and geysers
		C2.4 Tidal rivers, upstream from the estuary
		C2.6 Films of water flowing over rocky watercourse margins
Lakes	**31A0*** Transylvanian hot-spring lotus beds	
	3180 * Turloughs	
	3190 Lakes of gypsum karst	
		C1.5 Permanent inland saline and brackish lakes, ponds and pools
		C1.7 Permanent lake ice

3.4 Additional aspects of WFD and HD type comparisons

3.4.1 Heavily modified and artificial water bodies (HMWBs and AWBs)

WFD includes heavily modified (HMWBs) and artificial water bodies (AWBs). These water bodies constitute 16% and 17% of lakes and rivers respectively, according to the WISE-WFD reporting by Member States (Fig. 3.3). Although the aim of the HD is to protect habitats and species of special interest, the HD covers both natural and semi-natural habitat types. HMWBs and/or AWBs might therefore potentially contain the species or habitats relevant for inclusion in the HD. Due to the hydromorphological modifications underlying the designation of HMWBs and AWBs in the WFD, many of the natural habitats are usually degraded. Some HD species may also be lacking due to the habitat degradation. Therefore, the similarities between WFD types of HMWBs and AWBs and HD freshwater habitats would most likely be on an abiotic level. The absence of the species of interest for habitat classification would, however, result in bad conservation status in HD.

Figure 3.3 Percentage of total number of natural, heavily modified (HMWB), artificial (AWB) lakes and rivers and those with unknown status.



Notes: Modified from EEA, 2012.

Source: WISE-WFD database

3.4.2 Small water bodies

Small inland water bodies (streams and ponds) are abundant in most European countries. 80 % of the millions of kilometers of river network in Europe consist of small rivers, commonly known as headwaters, creeks, streams, brooks, or wadeable rivers and there are many hundreds of thousands of small lakes and ponds. Small water bodies are ecologically very important. They support specific and important hydrological, chemical and biological processes.

National examples also illustrate the importance of small streams and headwaters. Total river length in England is estimated to be around 136 000 km (Ordnance Survey, 2007). Small headwater streams dominate the resource, comprising around 70% of the total length of the river network in England (Natural England 2008). In Denmark, for example, 75 % of the total river length has a width less than 2.5 m (Sand-Jensen et al. 2006), and 80% of the total river length has width less than 5 m in Slovenia (ETC-ICM, 2007).

It has been estimated that there are more than 600 000 natural lakes in Europe (EEA, 1995), and as for rivers, small lakes predominate in terms of the total number, only around 100 000 had an area greater than 10 ha. Some country-specific estimates clearly show the importance of small standing waters. Thus, in Switzerland there are approximately 32 000 smaller ponds sized between 0.01 ha and 5 ha; (Oertli et al. 2005). Similarly, in Great Britain there are about 400 000 ponds sized between 0.0025 ha and 5 ha (Biggs et al. 2005). In Denmark there are just under 120 000 ponds ranging from between 0.01 ha and 5 ha (Søndergaard et al. 2005).

In Austria there are more than 25 000 standing waters with a surface area greater than 250 m^2 including natural and man-made lakes (Lebensministerium 2011). Only about 2 140 of the 25 000 standing waters have an area larger than 1 ha, the rest is smaller ponds. Based on the Ordnance survey maps (1:50000), there are 12 206 freshwater lakes in Ireland, but the majority are less than 1 ha in extent (NPWS 2008). Less than 2% of the lakes in Ireland have a surface area greater than 50 ha.

Often small water bodies are only to a limited extent included into environmental protection schemes and partly neglected in water and nature policies. The EU WFD protects all waters, but there has been a large administrative burden of managing a large number of very small water bodies. Results from the first RBMPs indicate that small water bodies have been considered only to a limited extent (EC, 2012). A large majority of Member States have used the size thresholds in typology System A of WFD Annex II (river catchments larger than 10 km^2 and lakes larger than 50 ha). Some Member States have explicitly included smaller water bodies if they are protected under other legislation or if they are ecologically important in the basin.

Small rivers with catchment size less than 10 km^2 are merged into larger water bodies for the purpose of WFD implementation. There are however some countries applying separate national types for very small rivers, e.g. Austria, Denmark, Italy, Netherlands, and United Kingdom (see Annexes 2 and 3).

Small lakes with a surface area less than 50 ha were only to a limited extent covered by water bodies designated by Member States.

- Austria, for example, only designated 62 lakes with an area greater than 50 ha in the first RBMPs, while
- 345 of 807 designated Irish lakes had a surface area less than 50 ha (NPWS 2008).
- There are 4275 lakes reported for Finland in the WISE-WFD database with an average area of 7 km^2 (ETC-ICM 2012). This corresponds to only 2.3 and 7.6 % of the Finnish lakes of sizes >0.0005 km^2 and >0.01 km^2 respectively (Finland’s environmental administration, web-site).
- Sweden has 7232 WFD lakes with an average area of 4 km^2 registered in the WISE-WFD database. As for Finland, this corresponds to only 7.6% of the lakes >0.01 km^2. (SMHI web-site)

In the HD, the names of the habitat types for standing waters indicate that also small lakes and ponds are included (e.g. habitat 3160 Natural dystrophic lakes and ponds), while for running waters, streams are not explicitly mentioned in any of the habitat types. However, small streams should be taken into account where appropriate. National guidances should be checked to see whether this actually happens (e.g. The French Cahiers d’Habitats describes subtypes for ’ruisseaux’ & ’petites rivières’, and the special case of chalk streams in the UK).

4 WFD ecological status and pressures in broad freshwater types

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 shown in tables 3.11 and 3.13 based on the similarity of national types. There is no formal connection between these broad types and the WFD reporting obligations, but they can be used as a tool to aggregate WFD data and other data reported by Member States for national types.

Natural and heavily modified and artificial water bodies were merged for this analysis, due to the intention to provide a simple overview of type-specific differences of all water bodies. However, as Member States have very different proportions of HMWB and artificial WB designated (for instance DE > 50 %, others have < 5%, EU mean is 16%, see section 3.4.1) and use very different approaches to classify them, this merging might lead to some uncertainty in the results.

Chapters 4.1 and 4.2 below show the results for rivers and lakes respectively.

4.1 Rivers

Very large rivers (broad type 1) and lowland, calcareous or mixed rivers (broad types 4 and 5) have the largest proportions of WBs failing good status (75-80%), and these types also have the largest proportion of water bodies with pressures (>80%) (Fig. 4.1). At the other end of the scale are the highland rivers with less than 30% failing good status, which is consistent with less than 30% having significant pressures. Most of the other lowland river types all are worse in terms of status and pressures than the EU mean result (55% less than good and 65% with pressures), while most of the mid-altitude rivers are better than the EU mean for both status and pressures.

These results are to be expected, due to the more intensive agriculture and higher population density in lowland areas of Europe (see also ETC-ICM 2012 and EEA 2012). Rivers in areas with siliceous geology have generally better status than those with calcareous or mixed geology, which again is probably related to the better suitability for agriculture on soils with calcareous or mixed geology.

The small Mediterranean temporary/intermittent streams have worse status and more pressures than the small Mediterranean perennial streams, but the difference is quite small.

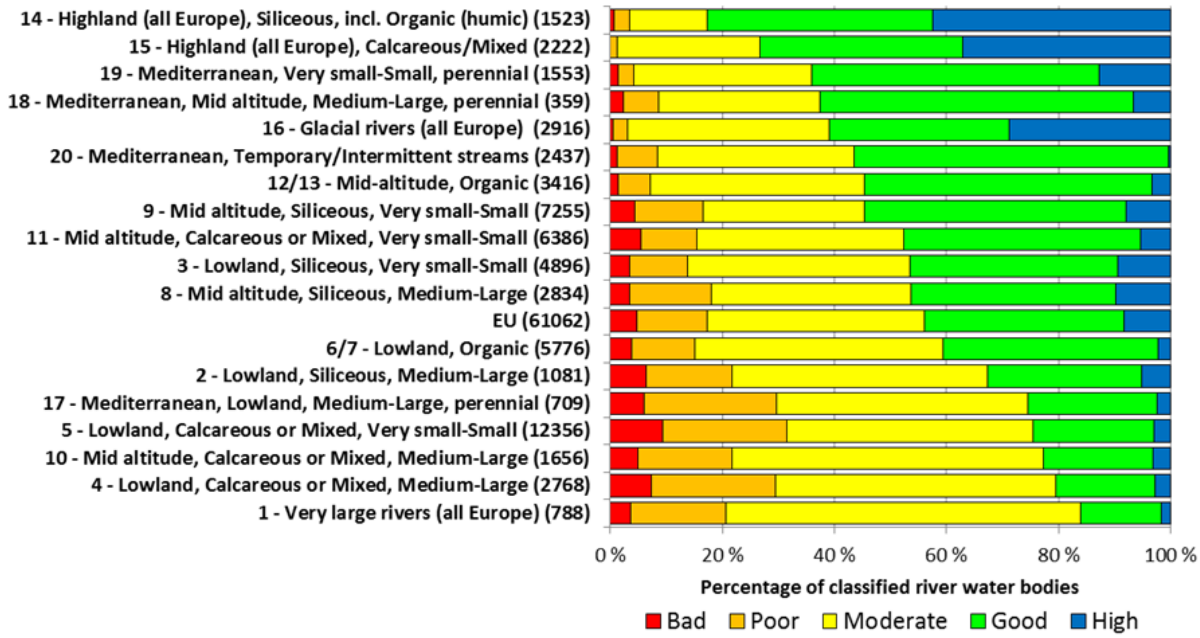
To see which of the WFD specific pressures were most important in the different broad types, each of these major pressure types were aggregated to the broad types. We included diffuse and point source pollution, hydromorphological pressures, but also water abstraction and other pressures (Fig 4.2).

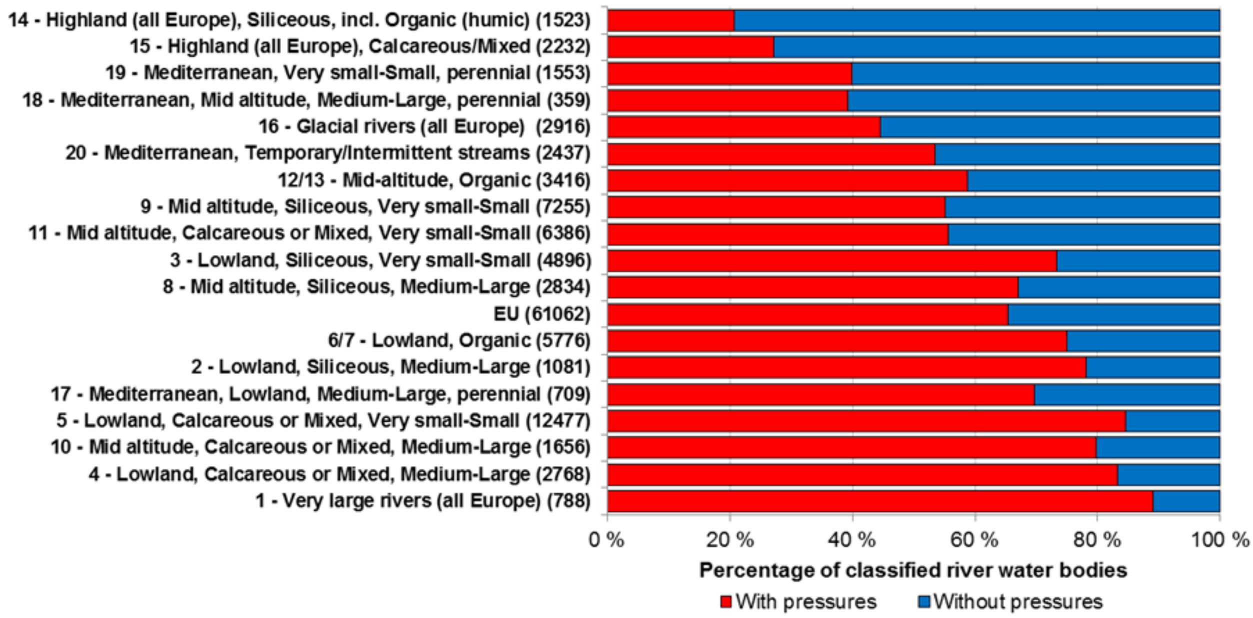
Diffuse source and hydromorphological pressures are the most important pressures reported, affecting an increasing proportion of the classified river water bodies, going from the best highland rivers to the worst lowland, calcareous rivers and very large rivers (Fig. 4.2). In the very large rivers 80% of the water bodies are exposed to HyMo pressures and less than one third to diffuse or point source pressures.

Point source pressures were most important in the lowland, calcareous rivers affecting from one-third to half of the classified river water bodies, while this pressure is negligible in highland rivers, glacial rivers and organic rivers, the latter mostly found in Finland and Sweden.

Water abstraction was most conspicuous in Mediterranean, mid-altitude, medium-large rivers affecting 20% of the classified river water bodies. This river type is an important source of water in the Mediterranean countries.

Figure 4.1 Ecological status and pressures of river water bodies aggregated to broad types.

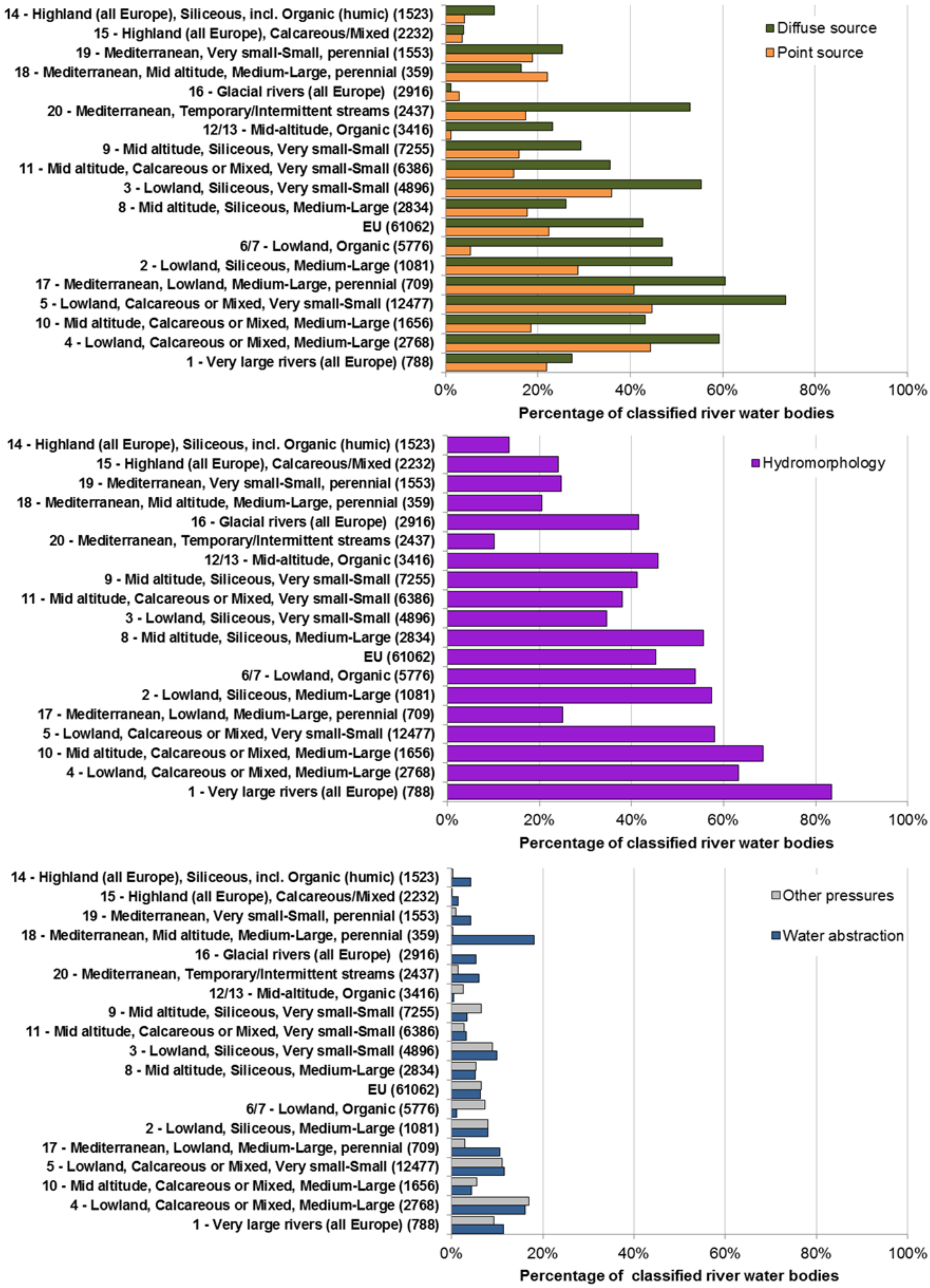




Notes: The broad types are sorted according to their proportion of good+high status water bodies, from the highest (top) to the lowest proportion (bottom) of the figure. The count of water bodies are given in parenthesis after each broad type. Types 6 and 7 are merged due to low number of water bodies in type 7. Types 12 and 13 are merged due to low number of water bodies in type 13. The ecological status and pressures of all water bodies where both status and pressures were reported and that could be linked to any of the broad types are displayed as “EU”.

Source: WISE-WFD database, May 2012.

Figure 4.2 Major specific pressures on river water bodies aggregated to broad types.



Notes: The broad types are sorted according to their proportion of good+high status water bodies, from the highest (top) to the lowest proportion (bottom) of the figure. The count of water bodies are given in parenthesis after each broad type. The pressures on all river water bodies that could be linked to any of the broad types are displayed as “EU”.

Source: WISE-WFD database, May 2012

4.2 Lakes

As for rivers, altitude appears to be an important factor for the ecological status in lakes with lowland lakes being worse than mid-altitude and highland lakes. Lakes with calcareous or mixed geology have worse status than siliceous lakes for each altitude category. This is especially pronounced for Mediterranean reservoirs, where the calcareous or mixed type has 70% failing good status and almost 80% exposed to significant pressures, versus the siliceous type where less than 40% are failing good status and only 50% are exposed to significant pressures. These results are to be expected, due to the more intensive agriculture and higher population density in lowland areas of Europe (see also ETC-ICM 2012 and EEA 2012), and the better suitability for agriculture on soils with calcareous or mixed geology. However, for the lowland organic, calcareous lakes that have the highest proportion failing good status (75%), only 43% of water bodies are reported to have significant pressures (Fig 4.3). It is unclear why the status and pressures are inconsistent for this lake type, although time-lags in responding to pressure reduction may be an explanation.

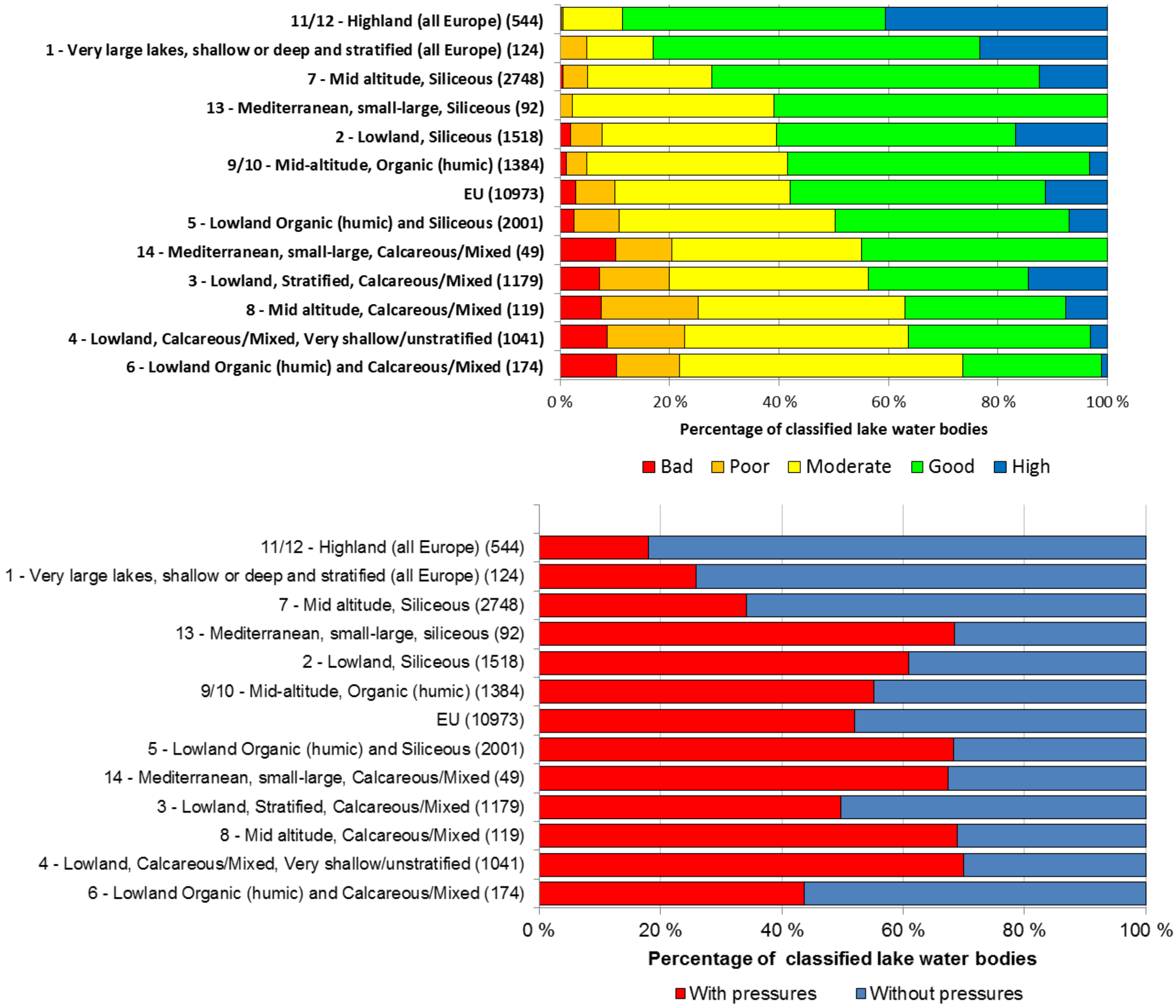
At the best end of the scale are highland lakes (broad type 11/12) and very large and deep lakes (broad type 1) with 85-90% of WBs with good status, and 75-85% of water bodies without significant pressures (Fig. 4.3). Some of the broad types with siliceous geology have only 40% of the water bodies failing good status, while as much as 50-60% have significant pressures. The reason why some lake types have more pressures than suggested by their status may be related to their recipient capacity, especially pronounced for the large, deep lakes.

The pressures affecting the largest percentage of the classified lake water bodies in almost all the broad types are diffuse source pollution pressures and HyMo pressures (Fig. 4.4).

Point source pollution was most important in Mediterranean reservoirs, especially those with calcareous or mixed geology, where roughly one third of the lake water bodies were affected by this pressure.

Water abstraction was most important in Mediterranean reservoirs with calcareous or mixed geology, where this pressure affects 40% of the water bodies. Also in Mediterranean reservoirs with siliceous geology water abstraction is an important pressure. These reservoirs are important water sources both for public water supply and for irrigation in the Mediterranean countries.

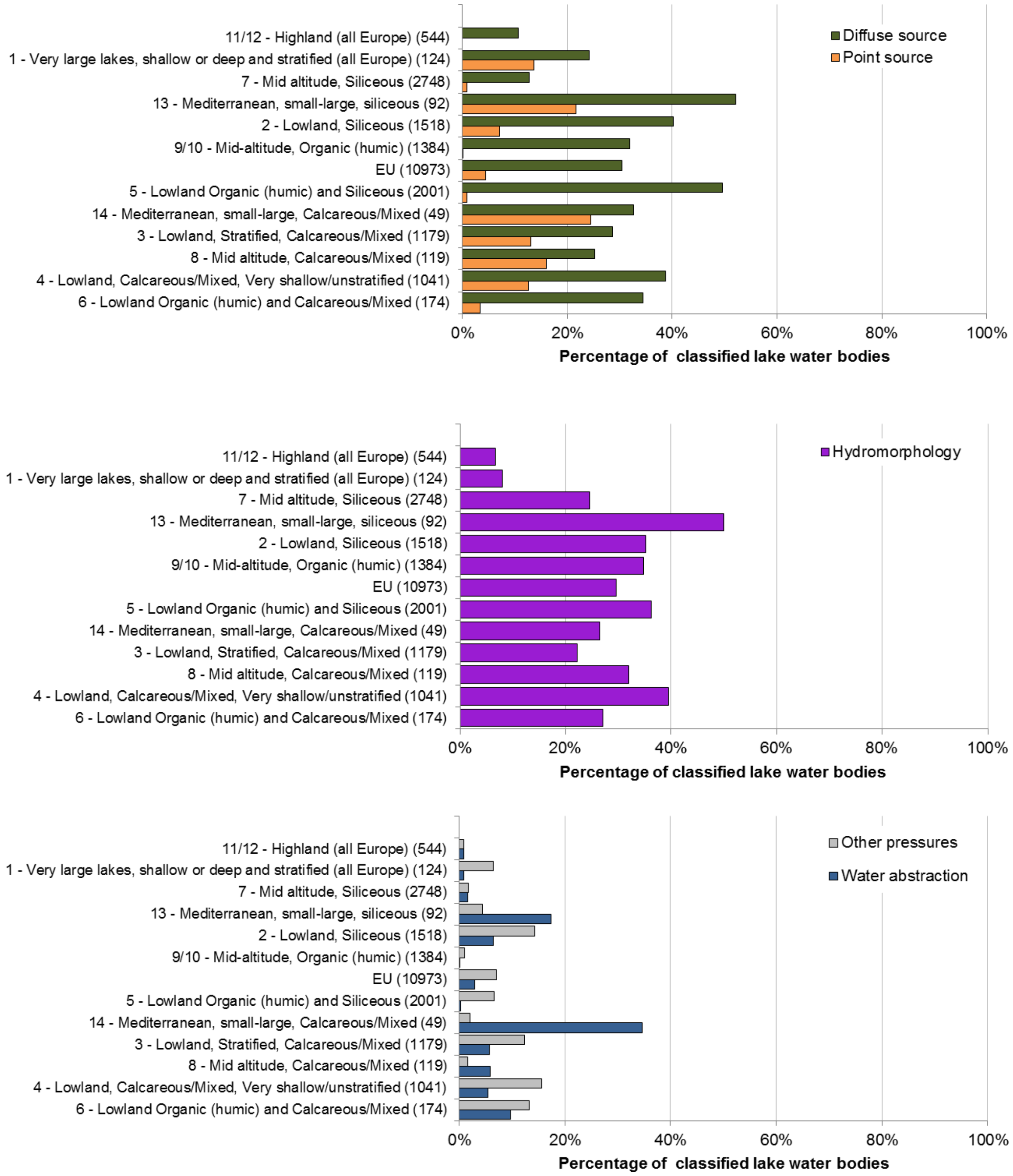
Figure 4.3 **Ecological status and pressures in lake water bodies aggregated to broad types.**



Notes: The broad types are sorted according to their proportion of good+high status water bodies, from the highest (top) to the lowest proportion (bottom) of the figure. The count of water bodies are given in parenthesis after each broad type. Types 9 and 10 are merged due to the low number of water bodies in type 10. Types 11 and 12 are merged due to the low number of water bodies in type 12. Type 15 (Mediterranean, Very small) includes no waterbodies and is not shown. The ecological status and pressures of all water bodies where both status and pressures were reported and that could be linked to any of the broad types are displayed as “EU”.

Source: WISE-WFD database, May 2012.

Figure 4.4 **Major specific pressures in lake water bodies aggregated to broad types.**



Notes: The broad types are sorted according to their proportion of good+high status water bodies, from the highest (top) to the lowest proportion (bottom) of the figure. The count of water bodies are given in parenthesis after each broad type. Types 9 and 10 are merged due to the low number of water bodies in type 10. Types 11 and 12 are merged due to the low number of water bodies in type 12. Type 15 (Mediterranean, Very small) includes no waterbodies and is not shown. The pressures on all lake water bodies that could be linked to any of the broad types are displayed as “EU”.

Source: WISE-WFD database, May 2012

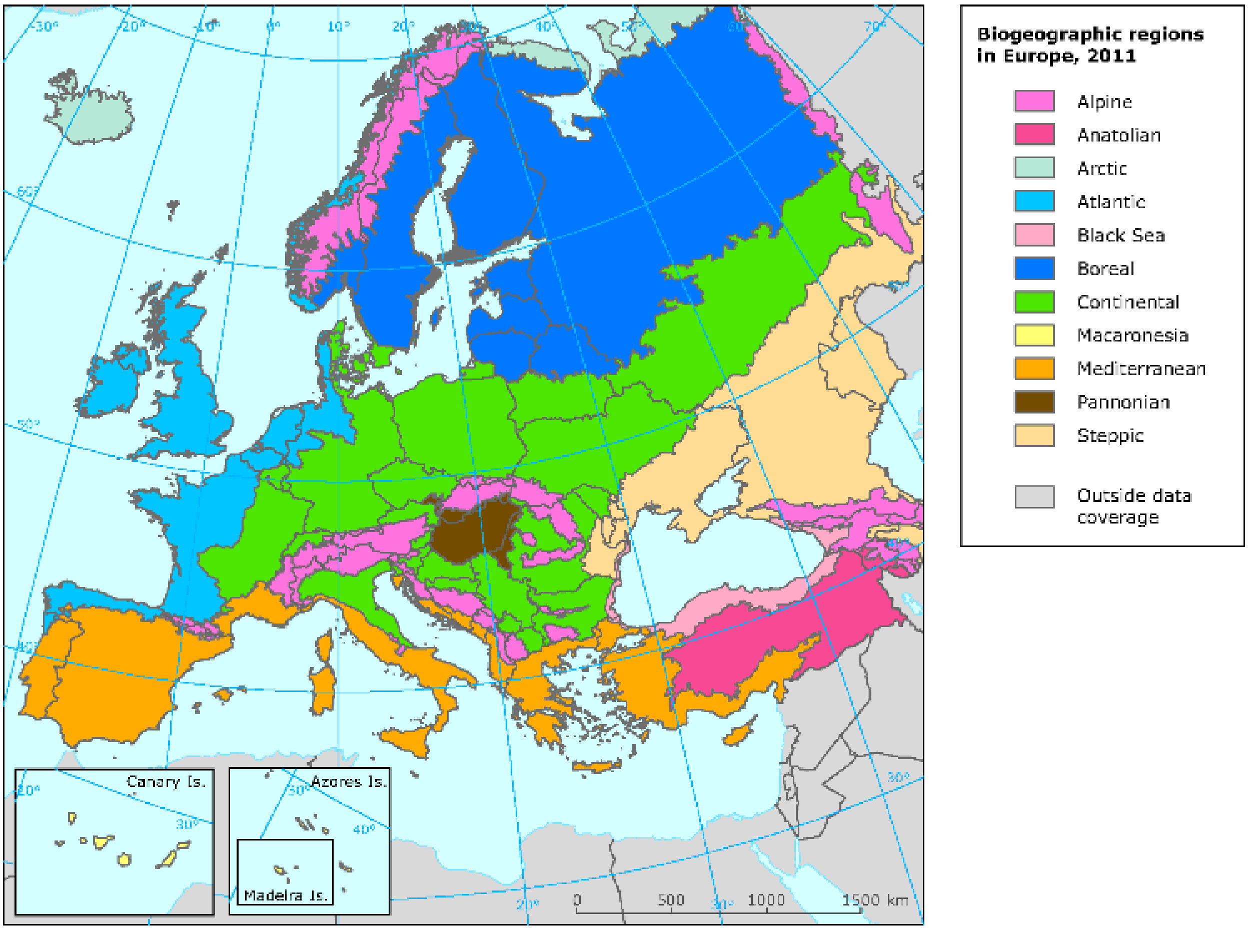
5 WFD ecological status and pressures in HD biogeographic regions and in Natura 2000 sites

This chapter presents WFD ecological status for rivers and lakes in each of the HD biogeographic regions and the WFD ecological status in river and lake water bodies related to Natura 2000 sites.

5.1 Ecological status of rivers and lakes in the HD biogeographic regions.

Using the geographic delineation of biogeographic regions (Fig. 5.1) and of each WFD lake and river water body, the water bodies could be grouped into each of the biogeographic regions, and their ecological status in each biogeographic region could be analysed.

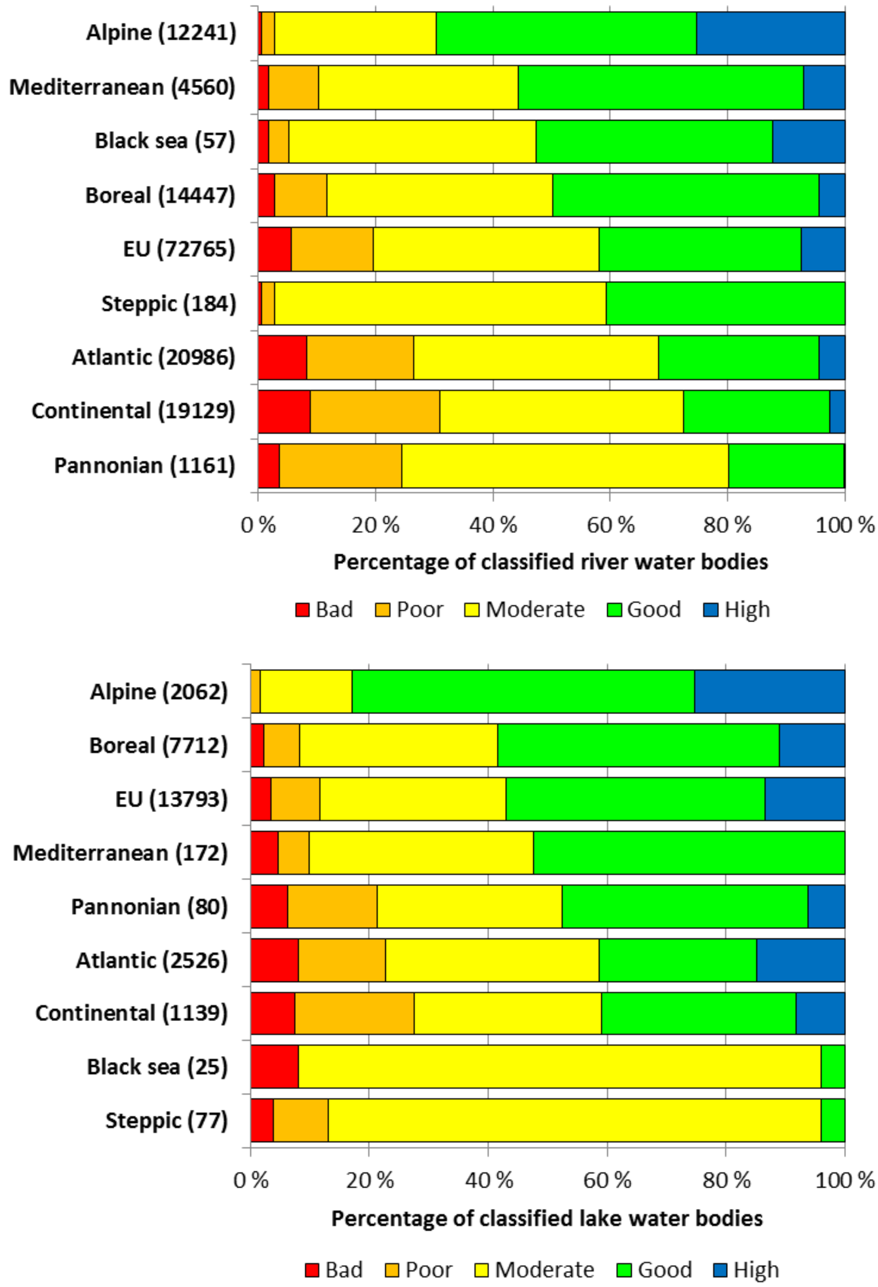
Figure 5.1 The HD biogeographic regions for all 28 EU Member States.



Source: EEA web-site: http://www.eea.europa.eu/data-and-maps/figures/biogeographical-regions-in-europe-1

The results (Fig. 5.2) show that Alpine rivers and lakes have the largest proportion of water bodies in good or better status. In this region 70% of the river water bodies and 80% of the lake water bodies are reported to be in a good or high status. In the Boreal region 50% of the rivers and 60% of the lakes are in a good or better status. In the Mediterranean region roughly half of the rivers and half of the lakes are in a good or better status. The Atlantic and Continental regions have only 35-40% of rivers and lakes in a good or better status, the large majority of water bodies failing the WFD objective.

Figure 5.2 **Distribution of ecological status of classified river water bodies within each biogeographic region. Rivers (upper panel), Lakes (lower panel).**



Notes: The number of water bodies are given in parenthesis for each region. Denmark and Spain are excluded, see chapter 3, section 3.2.3.

Source: WISE-WFD database and ETC-BD 2011

The results for the five larger regions (Alpine, Boreal, Atlantic, Continental and Mediterranean) are consistent with the results shown in the ETC-ICM 2012 and EEA 2012 report on Ecological status and pressures of European waters, showing better status in Alpine and Northern (boreal) parts of Europe and worse status in the Western and Central parts of Europe.

In the Black Sea and Steppic regions, more than 90% of the lakes are failing good status, while for rivers the situation is better in these regions with 50-60% failing good status. For the Pannonian region the situation is opposite with a better status for the lakes (50% failing good status) than for the rivers (80% failing good status).

In the three regions Pannonian, Steppic and Black Sea, there are relatively few water bodies, and the assessment systems for ecological status are less developed compared to the other regions. Thus the results for these three regions should be considered uncertain.

More detailed results at country level within each of the biogeographic regions are given in Annex 4.

5.2 WFD pressures aggregated to HD biogeographic regions.

In the Alpine region, the low pressures (Fig. 5.3) explain the good ecological status reported for the large majority of both rivers and lakes in this region (Fig. 5.2). However, one third of the river water bodies are exposed to significant hydromorphological pressures, mainly from hydropower production. This explains why one third of the river water bodies are failing good status.

In the Boreal region, the hydromorphological pressures are higher than in the Alpine region for both rivers and lakes, and in this region there is also significant pressure from diffuse pollution. The proportion of water bodies exposed to these two major pressure categories matches the proportion of water bodies failing good status in this region (40-50%).

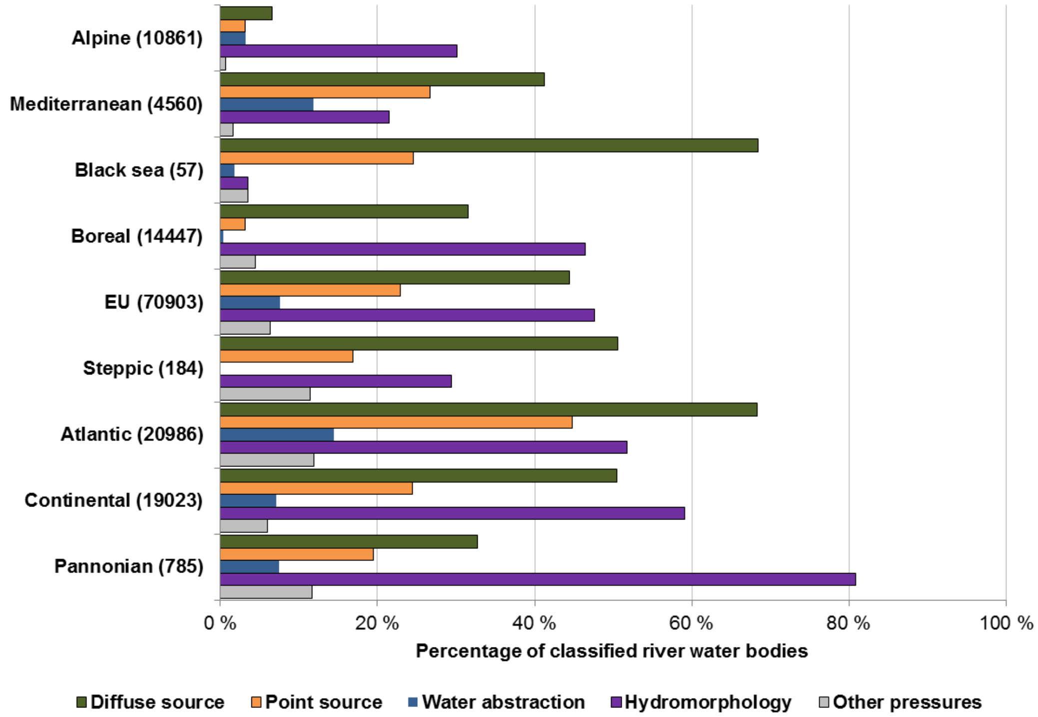
The pressure level in rivers and lakes in the Atlantic and Continental region is even higher, with a high proportion of water bodies being affected by diffuse pollution, hydromorphological pressure, as well as point source pollution. This high level of many pressures explains why the majority of water bodies for both rivers and lakes fail good status.

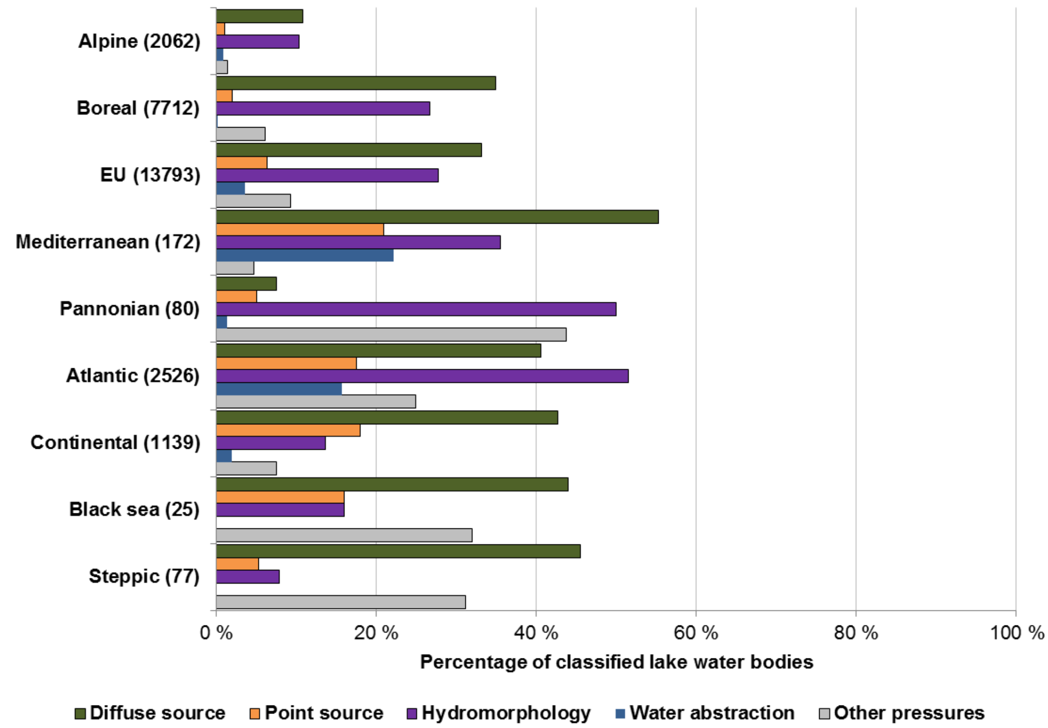
Mediterranean rivers and lakes (reservoirs) have intermediate pressure levels affecting 20-40% of the water bodies, including also water abstraction on top of the other major pressures: diffuse and point source pollution and hydromorphological pressures. This multitude of pressures causes half of the water bodies to fail good status.

Rivers in the Pannonian region have the worst status, which may be explained by the hydromorphological pressures affecting 80% of the water bodies. Pollution pressures from diffuse and point sources also contribute to the large proportion of rivers failing good status here (80%). The pressures in lakes in the same region are mainly hydromorphological for 50% of the lakes, matching the 50% failing good status.

In the Black Sea region, there is a mismatch between the pressure and status reporting. For rivers, the large majority is reported to have diffuse pollution (70%), while only 50% are failing good status. For lakes, it is opposite with 95% failing good status, but only half of the lake water bodies are exposed to any pressure. The same mismatch can be seen for lakes in the Steppic region, where only half of the lakes are exposed to pressures, but 95% fail good status. The low number of water bodies and the lack of fully developed classification systems for ecological status of lakes in these two regions can at least partly explain this mismatch.

Figure 5.3 WFD pressures in classified water bodies within each biogeographic region. Rivers (upper panel), Lakes (lower panel).





Notes: The number of water bodies is given in parenthesis for each region (DK and ES excluded, see section 3.2.3). The pressure category HyMo includes river management, water flow regulations, and other morphological alterations. The regions are sorted according to a decreasing proportion of good + high status water bodies from the top to the bottom of the figure (see figure 5.2).

Source: WISE-WFD database, May 2012 and ETC-BD 2011

5.3 WFD Ecological status in river and lake water bodies associated with the Natura 2000 sites

The HD Article 17 reports on conservation status at biogeographical level within each Member State do not give information for specific sites. However, each Natura 2000 site is described using a 'Standard Data Form' (EC 2011b) and there is a database holding all records. The Natura 2000 network consists of more than 26 000 sites and covers around 18 % of the EU territory (chapter 6 in EEA 2012).

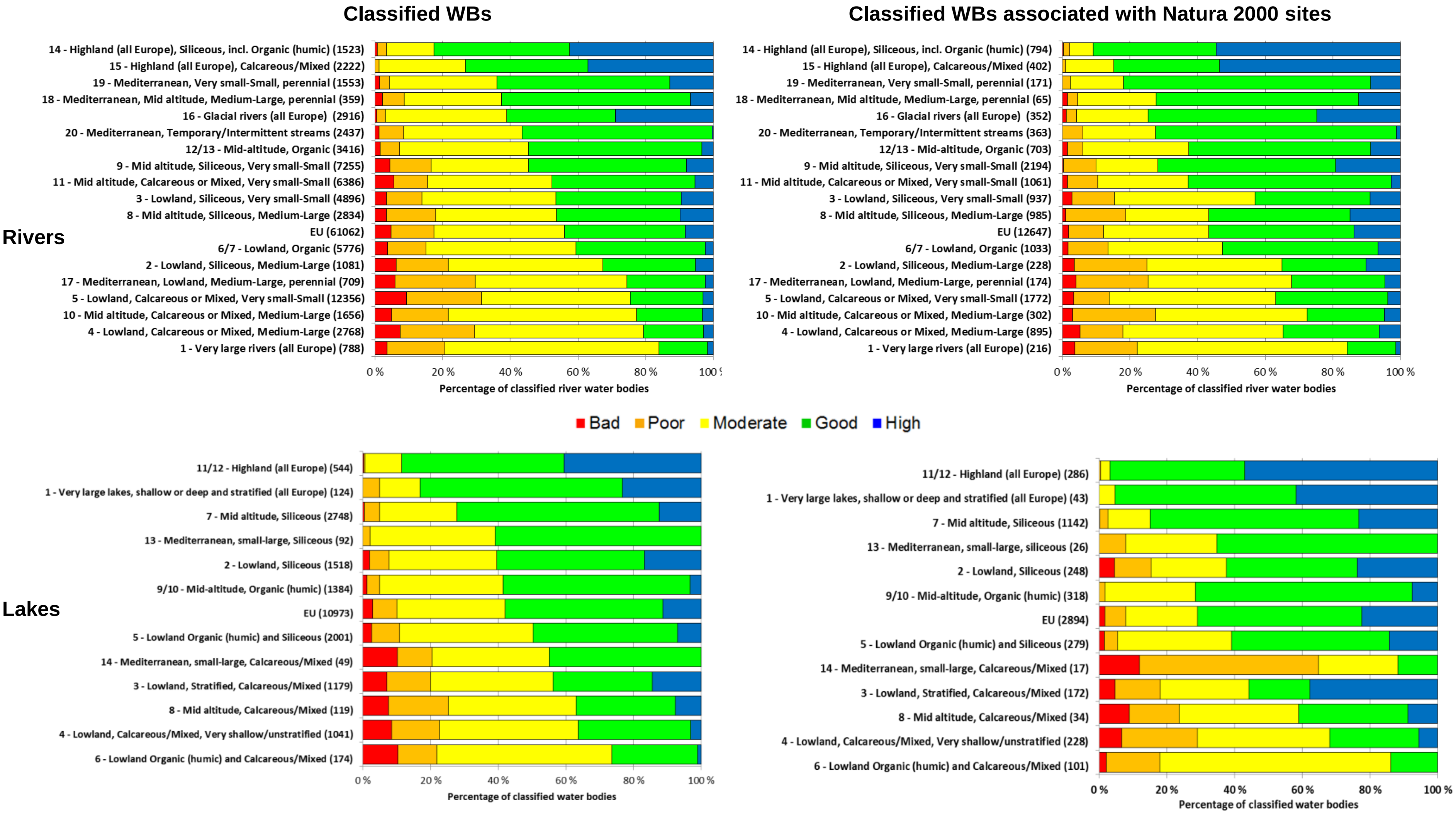
The ecological status of the water bodies related to Natura 2000 sites is compared with that of all water bodies based on WFD data reported for the first cycle of river basin management plans. The data are aggregated to the broad types defined in this report to assess type-specific differences (Fig. 5.4). At the EU level 21% of the river water bodies and 26% of the lake water bodies have been reported to be within or overlapping with the Natura 2000 sites. At the broad type level this proportion ranges from 11% for Mediterranean small perennial rivers (broad type 19) to 52% for highland siliceous rivers (broad type 14) and from 14% for lowland siliceous and humic lakes (broad type 5) to 58% for lowland calcareous and humic lakes (broad type 6).

The figure shows that in most broad types the ecological status is slightly better for water bodies associated with the Natura 2000 sites than for that of all water bodies, which is consistent with the expectation that there should be fewer pressures in the Natura 2000 sites than elsewhere. At the EU level for rivers, 57% of the water bodies within the Natura 2000 sites are in a good or better status, while only 44% are in a good or better status for all river water bodies. For lakes the difference at the EU level is even larger, with 71% of the water bodies within the Natura 2000 sites in a good or better status, while only 58% are in a good or better status for all lake water bodies.

There are deviations from this general pattern for certain types, e.g. very shallow, calcareous lowland lakes (broad type 4), calcareous and humic lowland lakes (broad type 6) and Mediterranean calcareous lakes (broad type 14), where better status is reported for all the water bodies than for those within the Natura 2000 sites. These types include nutrient rich lakes that are well suited for birds and wild-life, but 70-90% of these lakes are reported to have less than good ecological status for nutrient sensitive aquatic flora and fauna (e.g. phytoplankton, submerged macrophytes, benthic fauna, fish). These results indicate a potential mismatch between the HD and WFD objectives for such lake types.

Article 6 of the WFD requires Member States to establish a register of protected areas covered by other EU environmental legislation, including the protected areas of the HD. Article 4 requires Member States to achieve compliance with the standards and objectives set for each protected area in terms of habitats and species directly dependent on water by 22 Dec 2015.
An initial analysis by the ETC/BD shows that most of the Member States reported > 50 % of the Natura 2000 sites designated within their territory in the WFD register. The total protected areas under the Habitats Directive ranged mostly between 10 % and 15 % of the RBD area. The mean coverage of RBDs by Birds Directive protected areas was found to be 10 %.
The substantial differences in the proportion of water-dependent Natura 2000 sites included in the WFD Register result from the lack of unified methods for Member States to identify 'water-dependent' sites at the EU level. Potentially, many water-dependent Natura 2000 sites are omitted from the WFD Register and vice versa. A number of Natura 2000 terrestrial dry sites are included, although their dependency on the water environment is negligible or none. Clear guidance is needed for the Member States.

Figure 5.4 Comparison of ecological status for all classified water bodies with those associated with Natura 2000 protected areas.

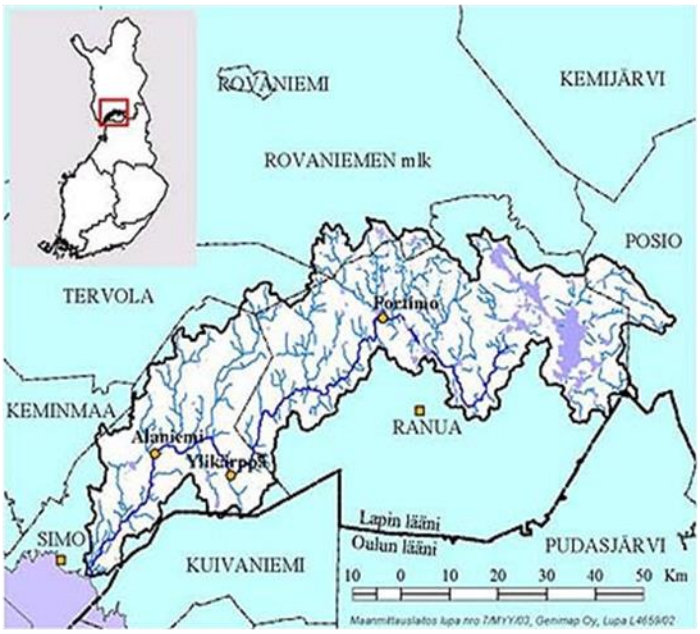


Notes: For all water bodies (left), and for water bodies associated with (overlapping/partly within or completely within) Natura2000 protected areas (right). Annex 5 shows the results per Member State within each broad type. Source: WISE-WFD database, November 2013.

In the WFD database it is possible to see when a water body is included in and protected by for example a Natura 2000 site, as demonstrated for the Simojoki river water body in Finland in figure 24. If it was possible to identify the protection area we might connect the WFD water system to a specific HD habitat.

Figure 5.5 An extract of the information available from the river water body Simojoki in Finland, and a map of the area.

EURBDCode	SWB_Name	Length	Ecological Status	PROT_AREA_ASSOC
FIVHA5	Simojoki	126.6	High	Y
FIVHA5	Ylä Simojoki	36.3	High	Y
FIVHA5	Ylijoki Simojoki	20.3	Good	N



Source: WISE-WFD database, May 2012.

6 Ecological status (WFD) and conservation status (HD) comparison for selected countries

6.1 Introduction to status comparisons

The WFD ecological status is reported for each water body as one of five classes: high, good, moderate, poor and bad, based on a combination of biological quality elements and supporting abiotic quality elements (ETC-ICM 2012). The HD conservation status is reported for each freshwater habitat and species in each of the HD biogeographic regions as one of four classes: favourable, inadequate, inadequate (deteriorating) and bad (ETC-BD 2011). A conceptual attempt to link the status classes of the two directives is illustrated in table 6.1 below. The criteria for status classification are different in the two directives, so no direct translation is possible between the status classes of the two directives.

Table 6.1 Conceptual attempt to link the status classes of the WFD and HD.

WFD Ecological status for river and lake water bodies of different types	HD Conservation status (mainly the “Structure and Function” component) of comparable freshwater habitats
High	Favourable
Good	
Moderate	Inadequate
Poor	Inadequate (deteriorating)
Bad	Bad

The aim of this chapter is to compare the WFD and HD status for river and lake water bodies of related types /habitats. However, such a comparison is not straightforward, since a test evaluation of the HD Article 17 conservation status reporting revealed that the data are too heterogeneous to be useful at EU level (ETC-BD 2011). Member States have applied different methods for assessing the conservation status, which may cause the same habitat type in the same region to have radically different statuses in neighboring Member States. As long as data are not comparable it is recommended to carry out a conservation status accounting per Member State only (ETC-BD 2011). The HD Conservation Status for freshwater Habitat types consists of four parameters of which ‘Structure and function’ is one. For some Member States (e.g. Finland), the ‘Ecological Status’ under the WFD was the main data source used for the assessment of the ‘Structure and Function’ part of the HD Conservation status for freshwater Habitat types. It is likely that other Member States used these data in the same way. However, the correlation between overall HD conservation status and the WFD Ecological status is likely to be weaker than the correlation between the parameter ‘Structure and Function’ and Ecological status.

In this chapter we therefore present case studies from selected countries where national WFD types could be aggregated to a limited number of broader types. The countries included are Sweden, Germany, Hungary, and some further incomplete examples from the UK, France and Denmark using major national WFD types and major freshwater habitats within the relevant biogeographical regions occurring in these countries.

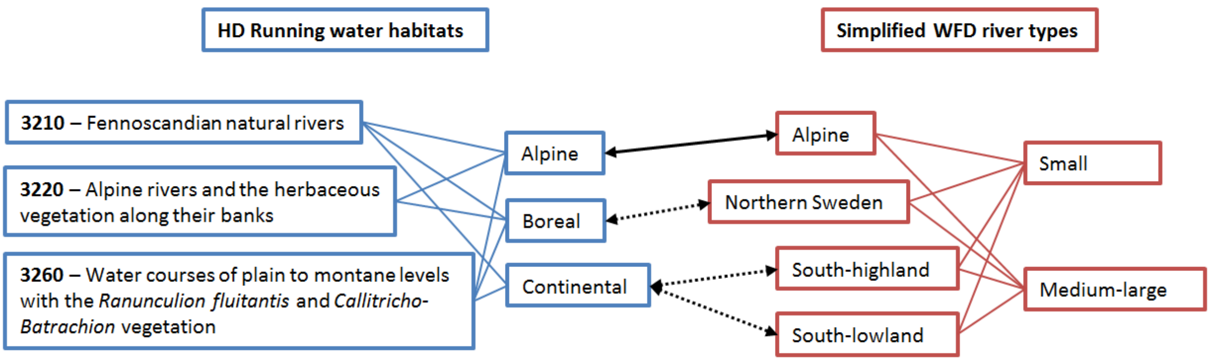
6.2 *Comparing WFD and HD status of water bodies in selected countries*

Case studies from selected countries where national WFD types could be aggregated to a limited number of major types. The countries included are Sweden, Germany, Hungary, and some further incomplete examples from the UK, France and Denmark. In these case studies, we used the HD Article 17 reporting from 2007 (ETC-BD 2008) to compare the ecological status of the WFD major national types with the conservation status of the most common freshwater habitats in the different biogeographical regions.

6.2.1 Example 1 – Sweden

Sweden has reported 52 national river types that are aggregated into eight major national WFD types, two of which are alpine. For the HD reporting period 2001-2006 Sweden reported that they had three HD running water habitats (3210, 3220, and 3260), of which all three occur in their alpine and boreal biogeographical regions, but only two are found in their continental region (only the Southern part of Skåne, see Fig. 5.1. A likely connection between the WFD types and the river habitats of the three biogeographical regions are given in Fig. 6.1. For the Alpine region the connection between the HD and WFD types/habitats is probably quite clear (solid black line in Fig. 6.1). The boreal biogeographical region covers most of Sweden (Fig. 5.1) and could correspond to the WFD types in Northern Sweden, while the continental biogeographical region covers the south western edge of Sweden and could correspond to "South-highland" and "South-lowland" WFD types (dashed black lines in Fig. 6.1).

Figure 6.1 Schematic presentation of Sweden's HD running water habitats (blue boxes and connecting lines) and the aggregated national WFD river types (red boxes and connecting lines).

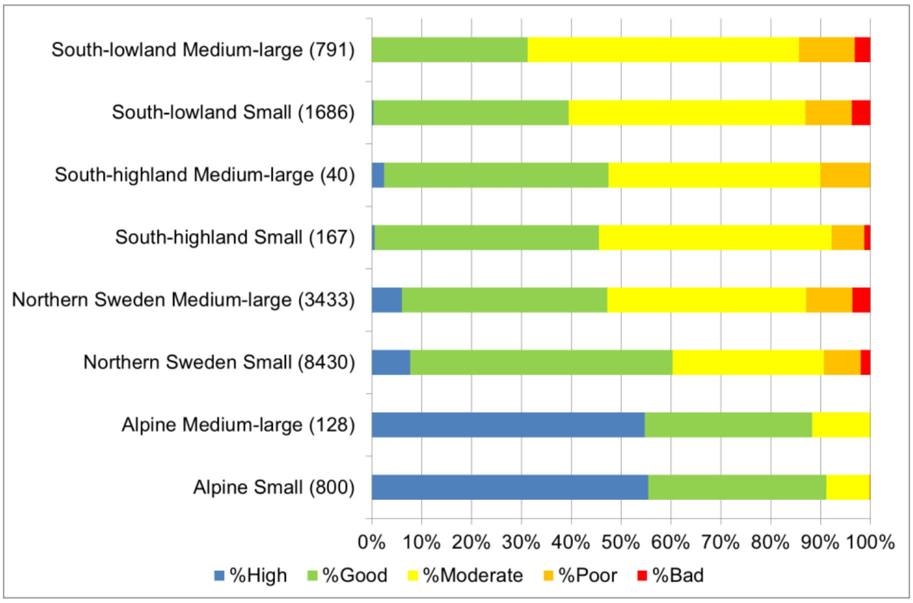


Notes: The solid black line indicates a connection between the HD and WFD types for the Alpine region; the dashed black lines indicate potential connections between HD regions/habitats and WFD types.

The WFD results of the ecological status of water bodies in the aggregated national Swedish WFD types show that approximately 90% of alpine river water bodies (small, and medium-large) had good (~35%) or high (~55%) ecological status (Fig. 6.2). In the Northern Swedish river types slightly less than half of the water bodies were in a good or better ecological status and less than 10% in a high status, while in the Southern Swedish river types only 30-45% of the water bodies were in a good status and almost none in a high status.

For the HD running water habitats, Sweden split their rivers into HD types 3210 and 3260 based on the size of the river, the average width of the two types are estimated to 25 and 10 m respectively (Article 17 reporting, internet resource). HD 3210 is the type "Fennoscandian natural rivers", a very broadly defined type that covers the smallest surface area of the HD river types in the Swedish alpine areas. The large rivers (3210) naturally make up a small proportion of the area in the alpine region, but are more abundant in the boreal region. The most common river habitat in the boreal region is the 3260 Water courses from plain to montane levels (Fig. 6.3).

Figure 6.2 WFD ecological status of Swedish river water bodies split into aggregated national WFD types.



Source: Kristensen, 2013

Figure 6.3 The HD conservation status of running water habitats in Sweden split into the biogeographical regions.

Favourable | Inadequate | Inadequate (deteriorating) | Bad | Unknown

	Alpine	Boreal	Continental
3210 Fennoscandian natural rivers	33	173	9
3220 Alpine rivers and the herbaceous vegetation along their banks	865	100	
3260 Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation	73	1556	78

Notes: The numbers in the grid show the total area of the national habitats as parts per million (ppm) of total country area.

Source: Habitat surface area data for each country and each habitat are based on the HD Article 17 reporting, e.g. for the Boreal region the information is at: http://bd.eionet.europa.eu/article17/index_html/habitatsreport/?group=ZnJlc2h3YXRlciBoYWJpdGF0cw%3D%3D&country=SE&region=BOR.

For the HD alpine biogeographical region, two of the three habitat types were reported as being in "favourable" conservation status, while HD 3210 had "inadequate and deteriorating" conservation status (a subdivision of "Unfavourable-inadequate"). Thus, the HD results for the Alpine region correspond well with the WFD good or high ecological status for most of the water bodies in the alpine national WFD river types.

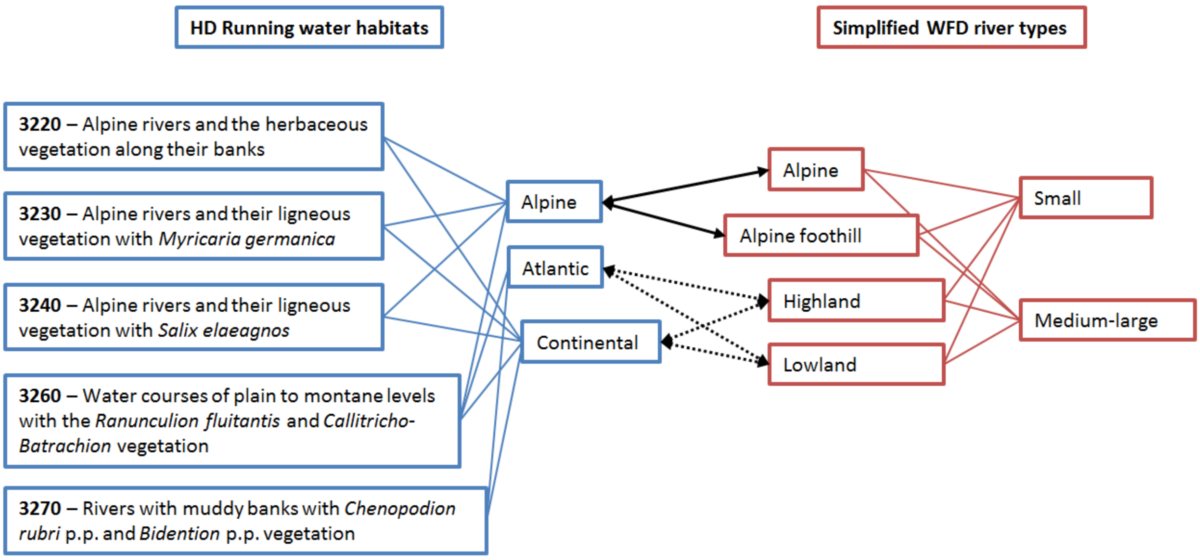
In the Boreal region that covers most of the country, both the most common habitats (3210 Fennoscandian rivers and 3260 water courses of plain to montane levels) are in an "inadequate and decreasing" conservation status, while 40-55% of the water bodies in the comparable Northern

Swedish WFD types are in a less than good ecological status. The status assessment given for the two directives for comparable rivers types/habitats in this region is thus more different than what was found for water bodies in the Alpine region. In the continental region the conservation status of both river habitats reported are inadequate, corresponding reasonably well with the WFD status for the Southern Swedish river types ranging from 55-70% of the water bodies in a less than good status. The overall status picture is quite consistent for the two directives for comparable types: Best status in the Alpine region, intermediate in the Boreal region corresponding to Northern Sweden and worst in the Continental region corresponding to the Southernmost Swedish rivers.

6.2.2 Example 2 – Germany

Germany reported five HD running water habitats (3220, 3230, 3240, 3260 and 3270), of which four occur in their alpine and continental regions, and two are found in their Atlantic region (Fig. 6.4). For the WFD, Germany use 25 river types with 8 subtypes (a total of 33), and 11 of these represent over 80% of the river water bodies. The 33 national river types including the subtypes are aggregated to 8 major types (modified from BMU/UBA, 2010). Some of these major types are related to the "Alpine" region (Kristensen 2013) and thus provide probable connections between the two reporting systems (solid black lines in Fig. 6.4). Both the Atlantic and Continental biogeographic regions could correspond to the Highland and/or Lowland WFD types but these connections are more tentative (dashed black lines in Fig. 6.4).

Figure 6.4 Schematic over the organization of Germanys HD running water habitats (blue boxes and connecting lines) and the simplified WFD river types (red boxes and connecting lines).

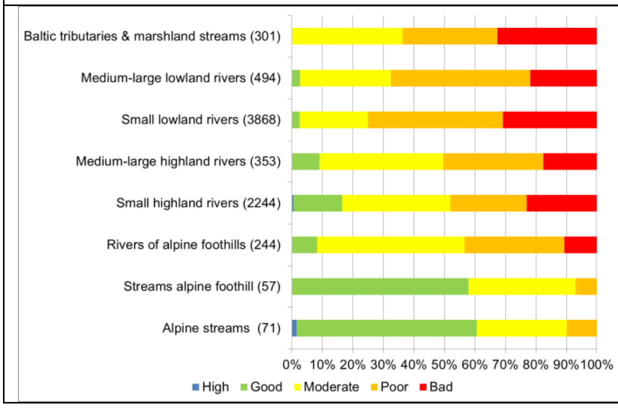
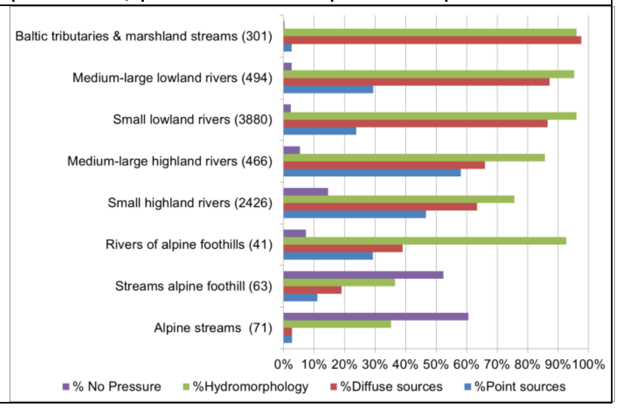


Notes: The black lines indicate a connection between the two organisation types; the dashed black lines indicate potential connections.

Source: Kristensen, 2013

Approximately 60% of alpine streams ("alpine" and "alpine foothills") had a good ecological status, whereas the rivers of the Alpine foothills had less than 10% of the water bodies in a good ecological status (Fig. 6.5 left-hand diagram), mainly due to hydromorphological pressures (Fig. 6.5, right-hand diagram). Germany reported that they have four HD river habitat types in their alpine region (Fig. 6.6). None of these were in a "favourable" conservation status, two were in an "inadequate status", one was in a "bad status", and one had an "unknown" conservation status (Fig. 6.6). Thus, HD results do not correspond well with the WFD results for Alpine streams, but there is a better correspondence with the ecological status of rivers of the Alpine foothills.

Figure 6.5 The ecological status (left) and pressures (right) of German river water bodies split into aggregated national types

Ecological status/potential of aggregated German river types	Percentage of river water bodies without pressures, or affected by hydromorphological pressures, point or diffuse pollution pressures
	

Source: BMU/UBA 2010, part 2, p. 60.

Figure 6.6 HD conservation status of running water habitat types found in Germany, split into the biogeographical regions.

Favourable Inadequate Inadequate (deteriorating) Bad Unknown

	Alpine	Atlantic	Continental
3220 Alpine rivers and the herbaceous vegetation along their banks	6		11
3230 Alpine rivers and their ligneous vegetation with Myricaria germanica	2		2
3240 Alpine rivers and their ligneous vegetation with Salix elaeagnos	25		28
3260 Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation	3	155	692
3270 Rivers with muddy banks with Chenopodion rubri p.p. and Bidention p.p. vegetation		34	358

Notes: The numbers in the grid show the total area of the national habitats as parts per million (ppm) of total country area.

Source: Habitat surface area data for each country and each habitat are based on the HD Article 17 reporting, e.g. for the Boreal region the information is at: http://bd.eionet.europa.eu/article17/index_html/habitatsreport/?group=ZnJlc2h3YXRlciBoYWJpdGF0cw%3D%3D&country=DE&region=ALP

For the other WFD river types in highland and lowland areas, the ecological status is less than good for 85-100% of the water bodies, and poor or bad for 50-75% due to both hydromorphological pressures and pressures from diffuse pollution affecting more than 80 % of the river water bodies (Fig. 6.5). In the Continental and Atlantic regions the majority of the river habitats had a bad conservation status, and none had a favourable conservation status (Fig. 6.6), thus corresponding well with the WFD status reported.

In conclusion, for both Sweden and Germany the alpine streams have a much better ecological status than the lowland streams and rivers. This result is to be expected given the much fewer pressures on highland streams (mainly hydromorphological pressures) than on lowland rivers (diffuse pollution and hydromorphologicaly pressures in addition to a range of other pressures (Kristensen 2013).

6.2.3 Example 3 – Hungary

The entire territory of Hungary is located within the Pannonian biogeography region and the country covers 70% of the area of the region. This biogeographical situation simplified the comparison of national river and lake types used in the WFD and HD.

<u>Rivers</u>

For the WFD river basin management plans (RBMP), Hungary uses 25 river types, from which we created aggregated broader types in this case study, namely: RBT1 Highland small, RBT2 Highland medium, RBT3 Midland small, RBT4 Midland medium, RBT5 Midland large, RBT6 Midland very large, RBT7 Lowland small, RBT8 Lowland medium, RBT9 Lowland large and RBT 10 Lowland very large. The ranges of altitude and size categories used in the RBMP are given in Table 6.2.

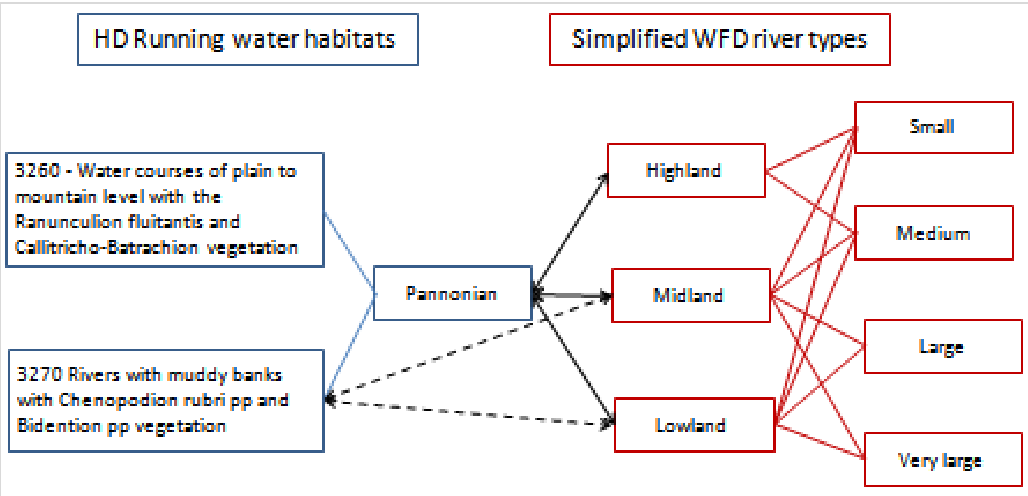
Table 6.2 Ranges of altitude and size categories for Hungarian river water bodies

	Category	Range
Altitude	Highland	> 350 m above sea level (masl)
	Midland	200 - 350 masl
	Lowland	< 200 masl
Catchment size	Very large	> 10 000 km^2
	Large	1000 - 10 000 km^2
	Medium	100 - 1000 km^2
	Small	10 - 100 km^2

Hungary reported two HD running water habitats: 3260 – Water courses of plain to mountain level with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation; and 3270 – Rivers with muddy banks with *Chenopodion rubri pp* and *Bidention pp* vegetation.

All likely connections between the WFD types and the river habitats of the Pannonian region within Hungary are illustrated in Figure 6.7.

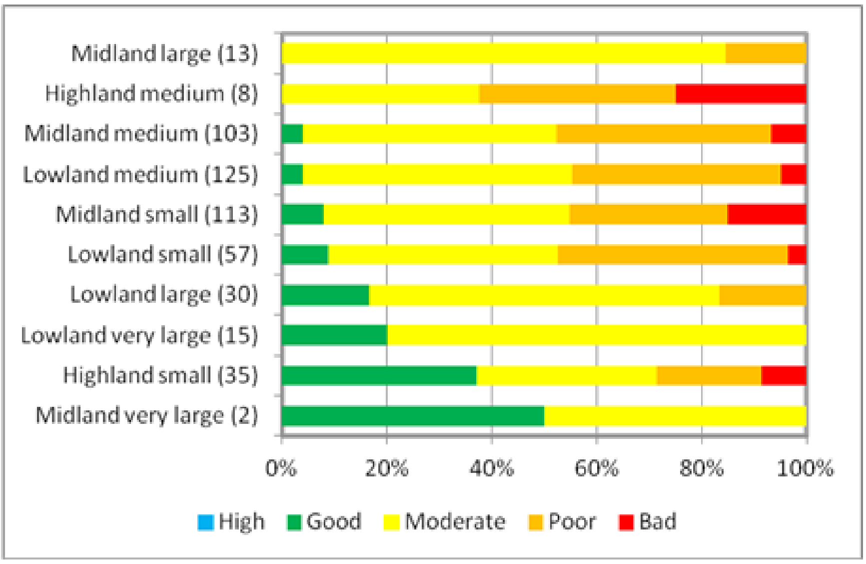
Figure 6.7 Schematic presentation of the Hungarian HD running water habitats (blue boxes and connecting lines) and the simplified national WFD river types (red boxes and connecting lines)



Notes: The dashed black lines indicate potential connections between HD habitats and WFD types.

There is no clear connection among the WFD types and river habitats when the major national WFD types are considered, because the HD 3260 habitat can be found from plain to mountainous regions (highland, midland and lowland) and the water courses size vary from small to very large. In the case of HD 3270 habitats, the situation is a bit clearer, as these habitats are located only within a narrow strip along the main rivers and only in midland and lowland regions. No HD 3270 river habitats can be found in highland regions.

Figure 6.8 WFD Ecological status of Hungarian river water bodies split into major national river types.



The WFD ecological status of the major national river types is shown in figure 6.8. Although the largest proportion of good status rivers are midland very large rivers (one of two river WBs) and small highland rivers, there is no clear distinction in the proportion of good status rivers between water bodies in the three main altitude category types (Highland, Midland and Lowland). One reason could be that the elevation difference among the Highland, Midland and Lowland categories is relatively low (Table 6.2).

None of the river habitats in the Pannonian region is in a favourable conservation status (Fig. 6.9).

Figure 6.9 The conservation status of HD Article 17 reporting running water habitats found in Hungary within the Pannonian region.

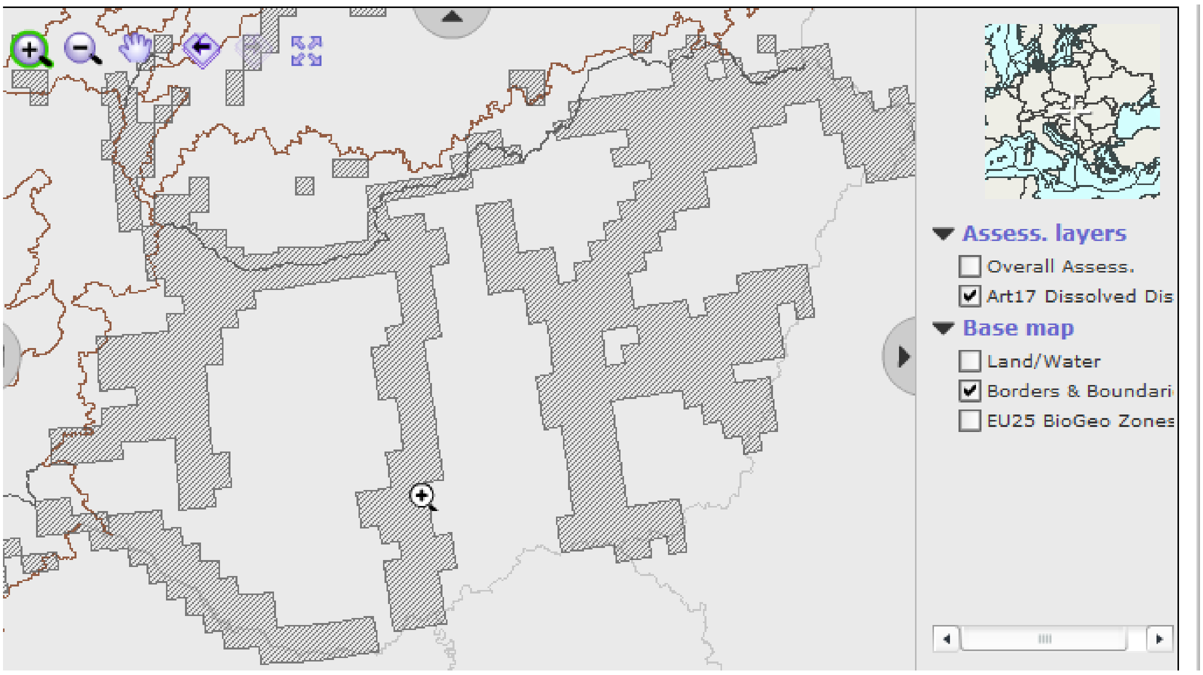
Favourable ■ Inadequate ■ Inadequate (deteriorating) ■ Bad ■ Unknown	**Pannonian**
3260 Water courses of plain to mountain levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation	9
3270 Rivers with muddy banks with *Chenopodion rubri pp* and *Bidention pp* vegetation	161

Notes: The numbers in the grid show the total area of the national habitats as parts per million (ppm) of total country area.

Source: Data are found at: http://bd.eionet.europa.eu/article17/index_html/habitatsreport/?group=ZnJlc2h3YXRlciBoYWJpdGF0cw%3D%3D&country=HU&region=PAN

The most common river habitat in the Pannonian region is the "3270 Rivers with muddy banks." This habitat type is mainly located alongside main rivers, which have a medium-fine river bed material or substratum (Figure 6.10).

Figure 6.10 Distribution map of HD 3270 habitat areas in Hungary.



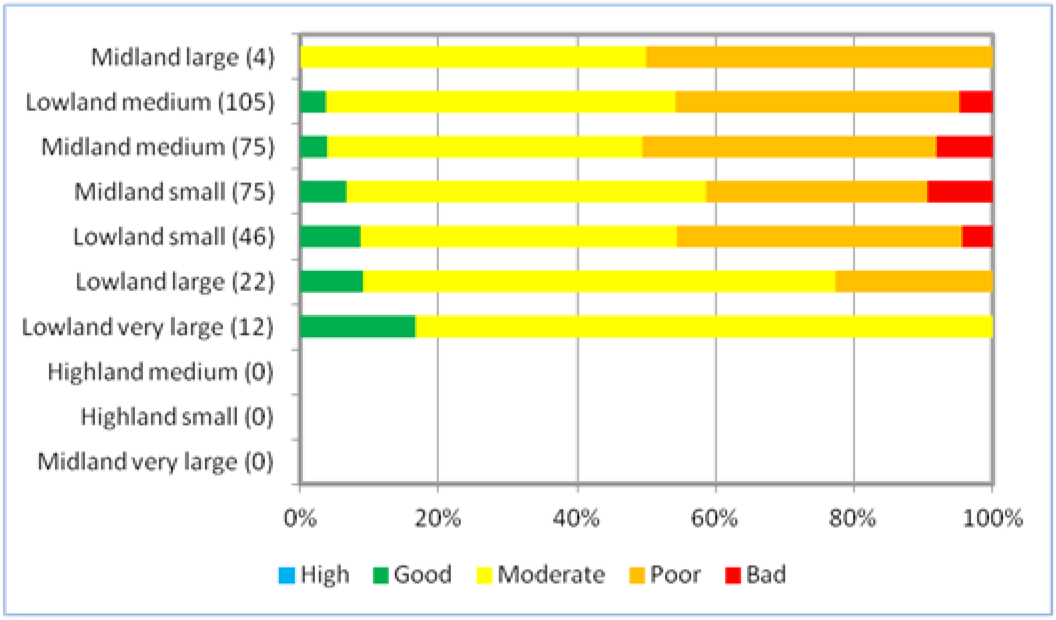
Source: http://bd.eionet.europa.eu/article17/index_html/habitatsreport/?group=ZnJlc2h3YXRlciBoYWJpdGF0cw%3D%3D&country=HU&region=

Looking at the spatial location of the 3270 HD running water habitats, one may propose that a third WFD river typology factor, namely the river substrate, might provide stronger connections. Rivers with muddy banks could be well characterized as rivers with a middle-fine substrate, which is relevant to all suggested broad river types, except RBT1 Highland small, RBT2 Highland medium and RBT6 Midland very large.

Figure 6.11 shows that for river water bodies located within or overlapping with the HD 3270 habitat, the lowland type river water bodies have a slightly better ecological status than midland type river water bodies. This may be due to the fact that the watershed of midland type rivers is hilly with much higher run-off and erosion potentially causing higher diffuse pollution. 3270 HD running water habitats cannot be found in Highlands, and there is no such habitat in connection with Midland very large rivers.

In conclusion, there is a relatively good consistency between the WFD status and the HD status for Hungarian rivers, both showing a similar picture with most rivers being in a moderate or poor ecological status corresponding to inadequate deteriorating conservation status for related habitats.

Figure 6.11 Ecological status of Hungarian river water bodies located within HG 3270 habitat areas.



Source: WFD WISE Database

Lakes

For the WFD RMBP, Hungary uses 16 lake types, from which we created seven aggregated major national types to investigate the connection with HD standing water habitats. These seven aggregated national types are: LBT1 Organic small, LBT2 Saline small, LBT3 Saline medium, LBT4 Saline large, LBT5 Calcareous small, LBT6 Calcareous medium, LBT7 Calcareous large. The different geology (hydrochemical) categories and size categories are given in Table 6.3.

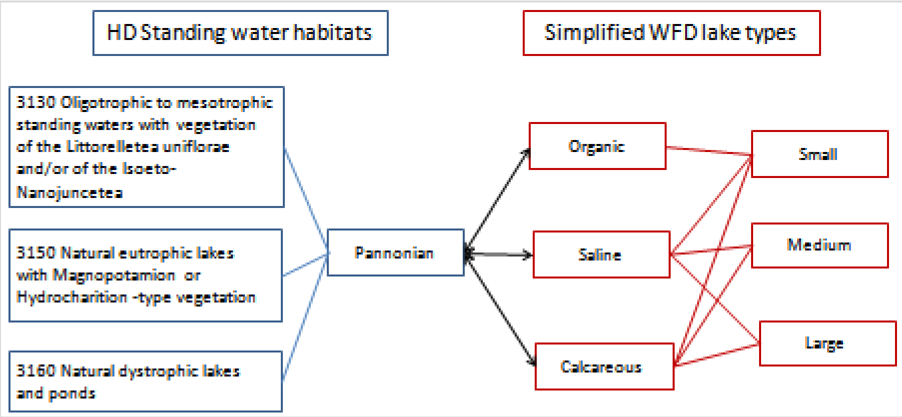
Table 6.3 Ranges of categories for lake water bodies.

	Category	Range
Hydrogeochemical character	Organic	-
	Saline	-
	Calcareous	-
Water surface size	Small	0.5 - 10 km^2
	Medium	10 - 100 km^2
	Large	> 100 km^2

Hungary reported three HD standing water habitats: 3130 Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoeto-Nanojuncetea*; 3150 Natural eutrophic lakes with Magnopotamion or Hydrocharition-type vegetation and 3160 Natural dystrophic lakes and ponds, and all of them are within the Pannonian biogeographic region.

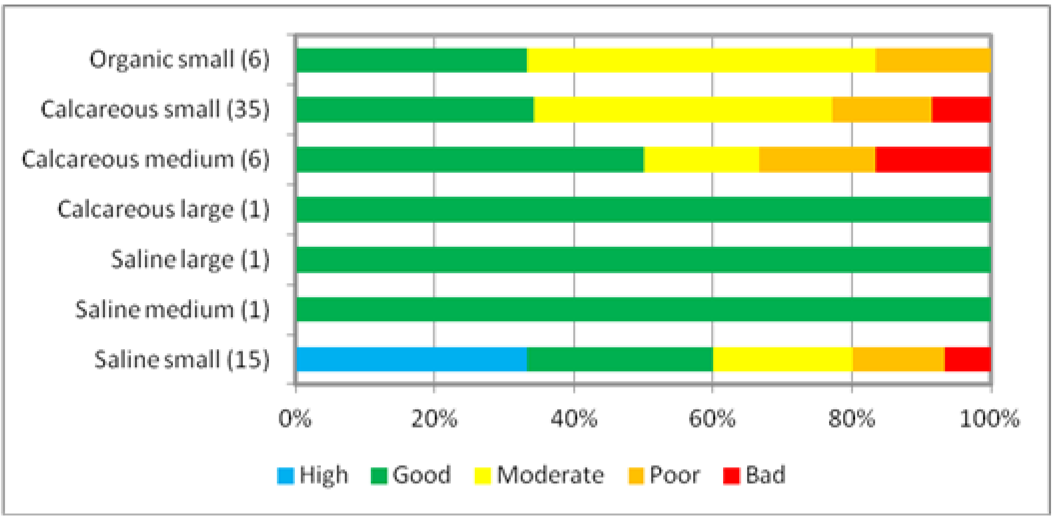
No strong, clear connections could be identified between the HD standing water habitats and the WFD lake types in Hungary (Fig. 6.12), although there could be some similarity between the WFD small organic lakes and the 3160 Natural dystrophic lakes and ponds, as well as between the Calcareous lakes and the 3150 Natural eutrophic lakes with Magnopotamion or Hydrocharition-type vegetation (such a link is suggested at the EU level in chapter 3 (Table 3.16).

Figure 6.12 Schematic presentation of the Hungarian HD standing water habitats (blue boxes and connecting lines) and the aggregated major national WFD lake types (red boxes and connecting lines).



The ecological status of the major national WFD lake types shows a more consistent picture than for the river water bodies. Figure 6.13 shows that saline lakes are in the best ecological status, with 33% of the saline small lakes being in a high ecological status, while the small calcareous lakes and small organic lakes have the smallest percentage of lakes with a good status.

Figure 6.13 Ecological status of Hungarian lake water bodies aggregated into major national WFD lake types.



The most common lake habitat in the Pannonian biogeographical region is the 3150 Natural eutrophic lakes with Magnopotamion or Hydrocharition-type vegetation. The distribution map of this lake habitat shows that such lake habitats can be found in about 80% of the area of Hungary. Consequently, all types of WFD lake water bodies could be connected to the 3150 HD standing water habitat, especially the calcareous small lakes comprising more than half of all lakes in Hungary (35 of 65 lakes) (Fig. 6.14).

Concerning the HD conservation status, all the identified lake habitats within the Pannonian region in Hungary were reported to be in inadequate (deteriorating) or bad status (Fig. 6.14). For the 3150 HD Natural eutrophic lakes this inadequate conservation status is quite consistent with the WFD ecological status for small calcareous lakes, where more than two thirds of the lakes are reported to be in moderate or worse status (Fig. 6.13).

Figure 6.14 Conservation status of the HD standing water habitat types in the Hungarian part of the Pannonian biogeographical region.

Favourable · Inadequate · Inadequate (deteriorating) · Bad · Unknown	**Pannonian**
3130 Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoeto-Nanojuncetea*	269
3150 Natural eutrophic lakes with Magnopotamion or Hydrocharition-type vegetation	5 503
3160 Natural dystrophic lakes and ponds	97

Notes: The numbers in the grid show the total area of the national habitats as parts per million (ppm) of total country area.

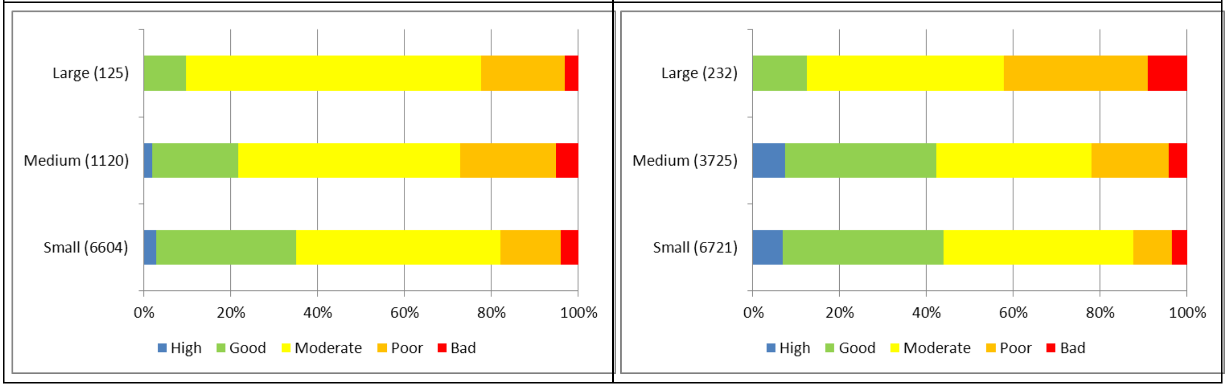
Source: data are found at: http://bd.eionet.europa.eu/article17/index_html/habitatsreport/?group=ZnJlc2h3YXRlciBoYWJpdGF0cw%3D%3D&country=HU&region=PAN .

6.2.4 Example 4 – UK and France

The rivers of UK and France can be aggregated to three major size types (Fig. 6.15). The ecological status in both countries is better in the small rivers than in the large rivers.

Figure 6.15 Ecological status/potential of small to large river types reported by UK and France.

Ecological status/potential of UK river WBs split into three types according to catchment size	Ecological status/potential of French river WBs split into three types according to catchment size

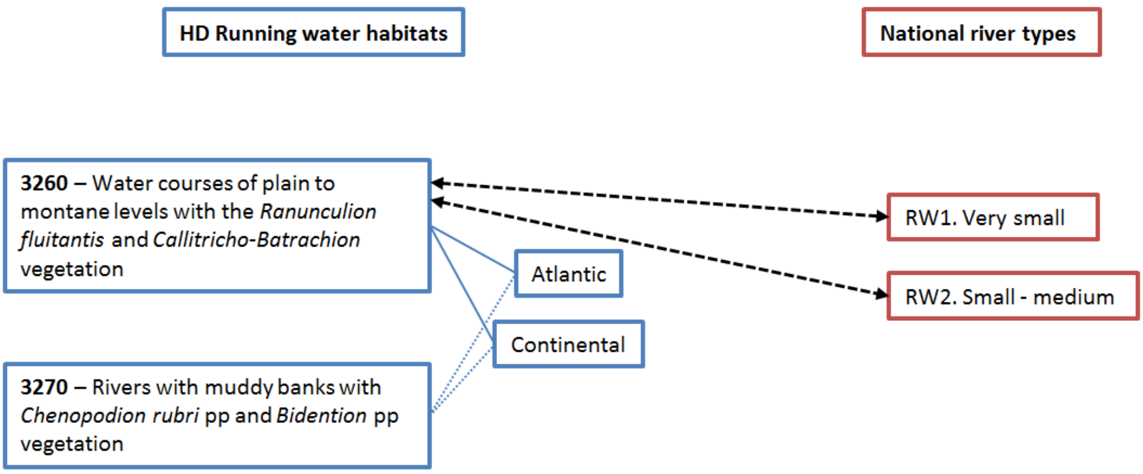


Notes: WBs = Water Bodies, UK: Small < 100 km^2; Medium 100-1000 km^2; Large > 1000 km^2
FR: Small < 100/150 km^2; Medium 100/150-1000/1500 km^2; Large > 1000/1500 km^2

6.2.5 Example 5 – Denmark

Denmark provides an additional example illustrating differences between typology systems. They report six national WFD types, where two types comprise 89% of river water bodies: RW1 represents very small rivers/streams (catchment size < 10 km^2, width < 2 m), and RW2 are small-medium rivers (catchment size 10 -100 km^2, width 2-10 m). For the HD Denmark reports the status for the river habitat 3260 (Water courses of plain to montane levels) for two biogeographical regions (Atlantic and Continental), and also have the HD river habitat type 3270 (Rivers with muddy banks), but the status for the latter is unknown.

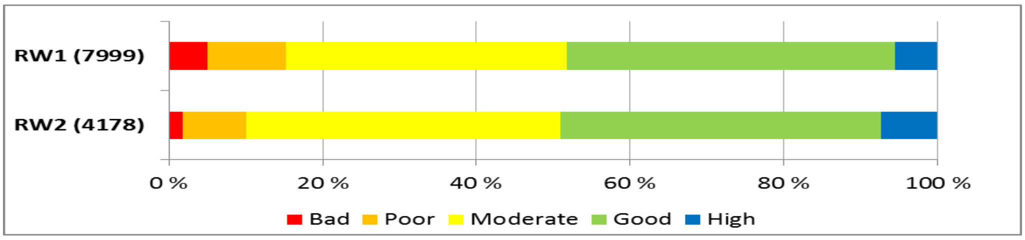
Figure 6.16 Schematic presentation of the Danish HD running water habitats (blue boxes and connecting lines) and the major national WFD river types (red boxes and connecting lines).



Notes: The dashed black lines indicate potential connections between the two sets of types.

In the attempt to link the HD and WFD types, we therefore assume that HD 3270 cannot be linked to any of the two national WFD river types, and that the HD 3260 can be found in both the WFD types (Fig. 6.16).

Figure 6.17 The ecological status of the major national Danish river types



Notes: RW1: very small rivers and RW2: small to medium sized rivers. The numbers in parentheses after the typology name are the total number of classified water bodies in each type.

Source: WISE-WFD database.

The ecological status of water bodies in the two main Danish national WFD river types, RW1 and RW2, are rather similar with almost half of the WBs having a good or high status (Fig. 6.17), while only 10-15% had a poor or bad status. The reported HD 3260 habitat have an inadequate conservation status in both the biogeographical regions (Fig. 6.18), which may be consistent with half of the WBs being in a less than good ecological status, although the conservation status does not show a distribution of status classes per habitat.

Figure 6.18 The conservation status of HD Article 17 reporting running water habitats found in Denmark split into the biogeographical regions.

■ Favourable ■ Inadequate ■ Inadequate (deteriorating) ■ Bad ■ Unknown

	Atlantic	Continental
3260 Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation	441	1160
3270 Rivers with muddy banks with Chenopodion rubri pp and Bidention pp vegetation	N/A	N/A

Notes: 3270 is noted as present for both regions, but assessed as 'unknown'. The numbers in the grid show the total area of the national habitats as parts per million (ppm) of total country area.

Source: Habitat surface area data for each country and each habitat are based on the HD Article 17 reporting at: http://bd.eionet.europa.eu/article17/index_html/habitatsreport/?group=ZnJlc2h3YXRlciBoYWJpdGF0cw%3D%3D&country=DK&region= .

7 Pressures (WFD) & threats (HD) comparison for selected countries

7.1 Linking pressures under WFD and threats under HD

This section aims to increase our understanding of the two streams for reporting pressures on freshwater ecosystems under the WFD and the HD and investigates the main pressures for the different freshwater habitats in Europe. The questions addressed in this section include:

- How to use information on pressures from the two reporting processes?
- How can WFD reporting on pressures supplement the HD reporting and vice versa?

The following explores whether pressure reporting requirements under the WFD can be linked to pressure/threats reporting under the HD, based on the revised list of HD pressures updated for the 2013 reporting (used both for the Article 17 report for 2007-12 and for the revised Standard Data Form). Based on the analysis of the relevant lists, it is discussed whether pressures reporting under the WFD can be improved in order to better match the (revised) list of pressures/threats of the HD for the next river basin planning cycle.

In the following table, the WFD pressures for surface waters (level 1 broad categories of pressures) are compared to the equivalent HD pressures (level 1 and level 2 columns of HD pressures list). In addition, a more detailed comparison of all relevant levels of equivalent pressures of the WFD and HD for surface waters is provided in the table in Annex 6.

Table 7.1 Comparison of pressures reporting for surface freshwaters under the WFD and the Habitats Directive.

WFD Pressures for Surface Water (Level 1 and 2)	**Habitats Directive Pressures (Level 1 and 2)**
1 Point Source pollution: 1.1 Urban waste water 1.2 Storm overflows 1.3 IPPC plants (EPRTR) 1.4 Non IPPC 1.5 Other	**H Pollution** H01 Pollution to surface waters (limnic, terrestrial, marine & brackish) (point and diffuse, separated at level 3)
2 Diffuse Source pollution: 2.1 Urban runoff 2.2 Agricultural 2.3 Transport and infrastructure 2.4 Abandoned industrial sites 2.5 Release from facilities not connected to sewerage network 2.6 Other	**H Pollution** H01 Pollution to surface waters (limnic, terrestrial, marine & brackish) (point and diffuse, separated at level 3, and specified further according to sources comparable with the WFD sources) H04 Air pollution, air-borne pollutants H06 excess energy (thermal heating of water bodies)
3 Water Abstraction 3.1 Agriculture 3.2 Public water supply 3.3 Manufacturing 3.4 Electricity cooling 3.5 Fish farms 3.6 Hydro-energy 3.7 Quarries 3.8 Navigation 3.9 Water transfer 3.10 Other	**A Agriculture:** A09 Irrigation **J Natural System Modifications:** J02.06 Water abstractions from surface waters

WFD Pressures for Surface Water (Level 1 and 2)	Habitats Directive Pressures (Level 1 and 2)
4 Water flow regulations and morphological alterations of surface waters: 4.1 Groundwater recharge 4.2 Hydroelectric dam Manufacturing 4.3 Water supply reservoir 4.4 Flood defence dams 4.5 Water flow regulation 4.6 Diversions 4.7 Locks 4.8 Weirs	**J Natural System Modifications:** J02 Human induced changes in hydraulic conditions: J02.03 Canalisation & water deviation J02.04 Flooding modifications J02.05 Modification of hydrographic functioning, general J02.12 Dykes, embankments, artificial beaches, general
5 River management: 5.1 Physical alteration of channel 5.2 Engineering activities 5.3 Agricultural enhancement 5.4 Fisheries enhancement 5.5 Land infrastructure 5.6 Dredging	**D Transportation and service corridors:** D01 Roads, paths and railroads **J Natural System Modifications:** J02.02 Removal of sediments J02.03 Canalisation & water deviation J02.05 Modification of hydrographic functioning, general J02.11 Siltation rate changes, dumping, depositing of dredged deposits J03 Other ecosystem modifications: J03.02 anthropogenic reduction of habitat connectivity
7 Other morphological alterations: 7.1 Barriers 7.2 Land sealing	**J Natural System Modifications:** J02 Human induced changes in hydraulic conditions J03 Other ecosystem modifications J03.02 anthropogenic reduction of habitat connectivity
8 Other Pressures: 8.1 Litter/Fly tipping 8.2 Sludge disposal to sea 8.3 Exploitation/removal of animals /plants 8.4 Recreation 8.5 Fishing 8.6 Introduced species 8.7 Introduced disease 8.8 Climate change 8.9 Land drainage 8.10 other	**F Biological resource use other than agriculture & forestry:** F01 Marine and Freshwater Aquaculture F02 Fishing and harvesting aquatic resources **G Human intrusions and disturbances:** G01 'Outdoor sports and leisure activities, recreational activities **H Pollution:** H05 Soil pollution and solid waste (excluding discharges) **I Invasive, other problematic species and genes:** I03 introduced genetic material, GMO **J Natural System Modifications** J02 human induced changes in hydraulic conditions J02.01 Landfill, land reclamation and drying out, general **M Climate change:** M01 Changes in abiotic conditions M02 Changes in biotic conditions

Source: WFD reporting guidance 21, 2009, chapter 7: (http://ec.europa.eu) and HD Article 17 reference portal, Section 7: http://bd.eionet.europa.eu/activities/Reporting/Article_17/reference_portal

The following lessons learned can be drawn from comparing the WFD and HD pressures reporting as in Table 7.1 and Annex 6:

- In all cases, there are equivalent options for reporting pressures under WFD and HD.
- For most of the WFD pressures listed under the categories “Point”, “Diffuse” and “Abstraction”, the reporting options under WFD and HD are identical.
- For the WFD pressures listed under the categories “FlowMorph” and “RiverManagement”, the picture is slightly different for equivalent pressure options under the HD. For example:
    - The HD seems to provide an option to report hydropower-related pressures only from “Small hydropower projects, weirs”, whereas the WFD option is broader under “Hydroelectric dam”, thus also covering large hydropower.

- For certain WFD pressures like “Flood defense dams” and “Water flow regulation”, the reporting options under the HD appear to be more differentiated.
- No direct equivalent is provided to the WFD navigation pressure “locks” under the HD. The HD merely refers to “surface water abstraction for navigation” and “wave exposure changes”.
- The HD pressures identified as (possibly) equivalent to the WFD pressures of the category “RiverManagement” appear more useful and specific from the perspective of hydromorphological assessments. For example, the HD list of pressures explicitly refers to the removal of sediments and dredging, which is not mentioned in the WFD list of pressures.
- The HD pressures identified as equivalent to the WFD pressures in the categories “Fishing”, “Introduced species” and “Climate change” are also more detailed than the reporting options provided in the WFD list of pressures.

In summary, both the WFD and the HD lists for reporting pressures can be improved, drawing on lessons learned from this comparison. Especially, the WFD list of pressures can be improved for the next reporting cycle to match the revised pressures under the HD, especially for the following categories:

- Some items in the category “FlowMorph”
- “RiverManagement”
- “Fishing”
- “Introduced species”
- “Climate change”

In the revised WFD reporting guidance (v.4.9), the list of pressures has indeed been improved and is now better matching many of the HD pressures related to hydromorphology, e.g. WFD pressures “Abstraction/Flow diversion” and “Physical alteration of channel/bed/riparian area” matching the HD pressure “J02.03 Canalisation and water deviation”. 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.

7.2 Main pressures affecting freshwater systems in Europe

Table 3.1 “Broad types of rivers and lakes and their main pressures and impacts” relates the key types of freshwater systems in Europe to the pressures most commonly affecting them. The aggregation of pressures according to different types has been done on the basis of expert knowledge on the main pressures on key European freshwater systems.

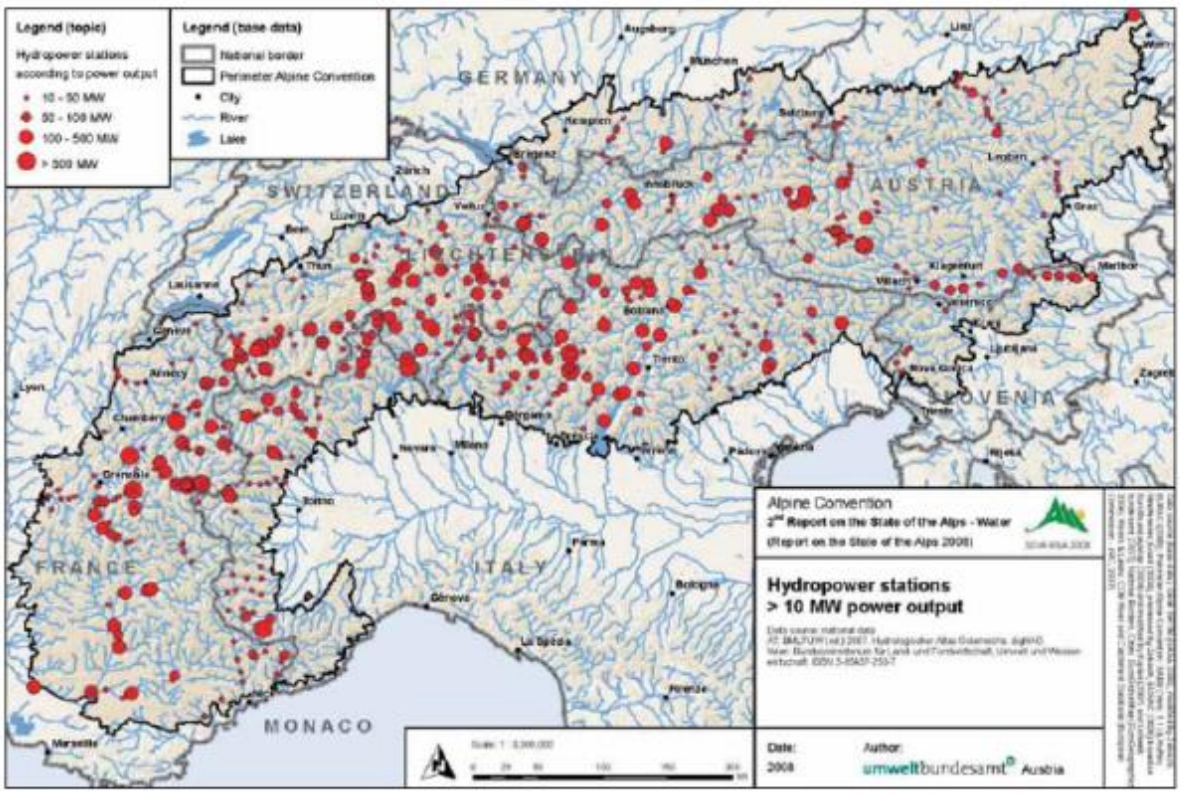
First insights based on these conceptual linkages between pressures and key types of European freshwater systems are the following:

- Alpine and highland/midland types of freshwater systems are mainly affected by storage pressures (e.g. hydropower), flow disruptions, disruption of continuity and sedimentation. The high concentration of large hydropower stations and of dams/reservoirs for several uses in the alpine region is an illustrative example (Figures 7.1, 7.2, 7.3)
- Lake ecosystems in alpine and highland/midland regions are affected by climate change and introduced species.
- Freshwater habitat types in the lowlands are exposed to a much higher number of different pressures, compared to alpine and highland environments. In addition to the pressures mentioned above for alpine and highland/midland areas, abstraction pressures, pollution (point and diffuse)

and a high number of physical modifications (straightening, embankments, planform change, modification of floodplain and riparian zone) are added to the picture. Furthermore, drivers such as agriculture, flood protection and navigation play a much larger role than in highland/midland areas.

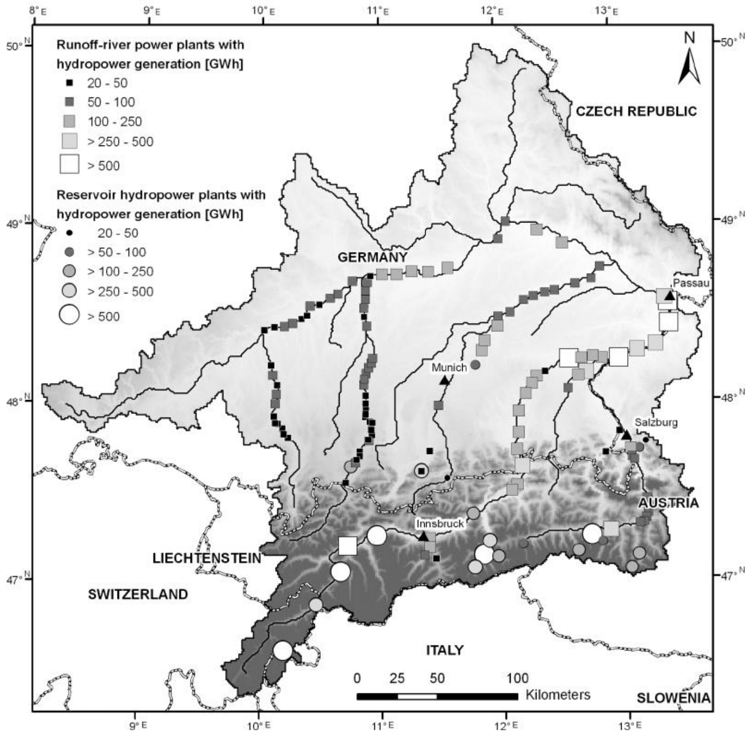
- For example, in the Guadalquivir river basin in southern Spain, irrigation is the main pressure on water quantity. Irrigated plots are concentrated along the main course of the river in the lowlands and agriculture accounts for 86% of water consumption (Cherlet 2007). Also in the German Weser river basin, which is located in north-central Germany, 60% of its area is used for agriculture. The fertile black earth soil in the central part of the river basin provides good conditions for farmland whereas in the mountainous regions in the south, the land is cultivated to a lesser extent. Also in the coastal region in the north, marshland and grassland is prevalent (Cherlet 2007).
- Mediterranean types of freshwater systems are affected mainly by flow regulation and water storage, related to other impacts such as sediment retention, water abstraction and climate change (increased duration of droughts, flash floods).
- In addition to analysing pressures as they affect water bodies due to their position in the landscape (e.g. alpine, highland/midland, or lowland), it is also important to acknowledge the relationship of water body size and the occurrence of specific pressures. For example, as rivers increase in size, they are less influenced by immediate riparian zone conditions (e.g. shading, litter and woody debris input). At the same time, they become more linked to a broader floodplain area beyond the immediate channel. Large rivers that have been modified for flood protection or navigation are typically impacted by levees, groynes, dredging, or transverse structures. These are pressures which de-couple the river from its floodplain.

Figure 7.1 Hydropower stations with a power output greater than 10 MW in the Alps



Source: Permanent Secretariat of the Alpine Convention, 2009, used with permission from the publisher.

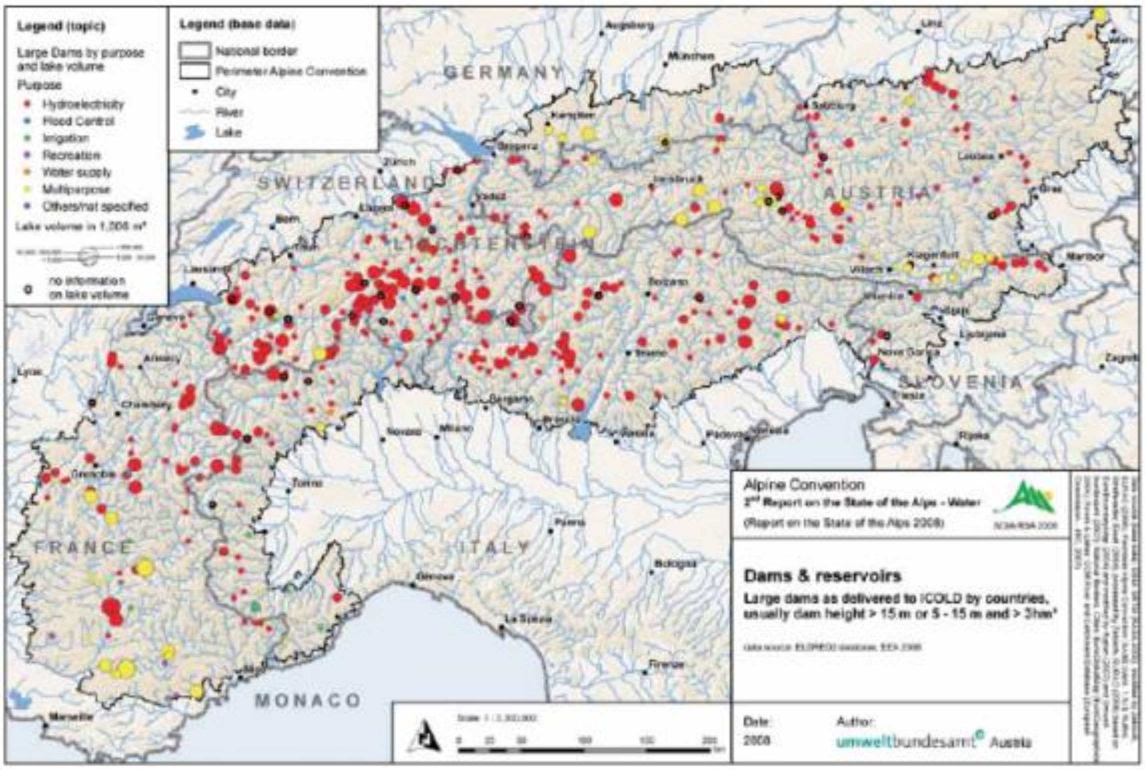
Figure 7.2 Hydropower plants on the main rivers of the Upper Danube watershed



In the mountainous Upper Danube watershed (77 000 km²) covering parts of Germany and Austria, there are approximately 140 hydropower plants. In the alpine headwaters, 20 of these are big reservoir hydropower plants, with an annual energy output of more 250 GWh. There are 120 smaller run-of-the-river stations hydropower plants with an annual hydropower energy generation of 20 to 500 GWh, mainly situated on the river Danube and its larger tributaries Iller, Lech, Isar, Inn and Salzach.

Source: Koch et al. 2011, used with permission from the publisher in the ETC/ICM technical report 2/2012 Hydromorphological alterations and pressures, page 42.

Figure 7.3 Dams and reservoirs in the Alps



Source: Permanent Secretariat of the Alpine Convention, 2009, used with permission from the publisher,

7.3 Comparing the pressures under the WFD and HD for broad climatic/altitude types in four countries (DE, IE, SE and HU)

7.3.1 Background

In the conservation status reporting (2001–2006) under the Habitats Directive, the EU-25 Member States have reported the main threats affecting the conservation status of habitats in rivers, lakes, transitional waters and coastal waters (EEA, 2012). The main threats identified were similar to the pressures and impacts reported via the WFD RBMPs. Results from Member State reporting under the Habitats Directive indicate that more than 70 % of the lake and river habitat types are affected by either modification of hydrographic functioning, biocenotic evolution (eutrophication and invasion of alien species) or pollution. This is similar to the results from the RBMPs, which showed that the pressures reported to affect most surface water bodies are pollution from diffuse sources causing nutrient enrichment, and hydromorphological pressures causing altered habitats.

The following section illustrates potential similarities of key pressures under the two different reporting streams. A quantitative and qualitative comparison was made from the reporting of Germany, Hungary, Ireland and Sweden on WFD pressures (RBMPs 2009) and HD pressures reported under article 17 for the period 2001 to 2006. Because of the differing levels of detail of the national water body typologies, it was not always possible to assign water body size to the WFD data in a reliable manner (Annex 7). Also, the descriptions of HD habitat types do not include size categories. Therefore, the cross-walking exercise of the two pressures reporting streams focused primarily on the relative distribution of pressures across the Alpine, Mid-altitude, and Lowland broad climatic / altitude types for rivers and lakes (chapter 3, table 3.1).

7.3.2 Methods

WFD pressures data for individual water bodies were extracted from the WISE WFD database (updated 29.05.2013), and the national water body typologies were matched to the broad geographic types presented in table 3.11 and 3.13. Unlike the WFD reporting, HD pressures data were not available for individual water bodies, but rather for habitat types (chapter 3.1.3, table 3.5).

The HD pressures data were downloaded from the Habitats Directive Article 17 database (2008). To enable a comparison of WFD and HD pressures within each broad altitude type, the HD bio-geographic regions were translated into the broad climatic/altitude types presented in chapter 3, Table 3.1. Unlike the WFD pressure data, the HD pressure data for freshwater habitats in a specific biogeographic region could not be assigned to more than one broad altitude type, since these data were not reported for individual water bodies. This limited the comparisons that could be drawn between the two reporting streams.

The following examples and figures for Germany, Hungary, Ireland, and Sweden are presented in a similar fashion. Unless otherwise stated, all graphs are presented as follows:

- Pressures are listed in a descending order of cases reported.
- WFD pressure data show the seven main pressure categories used in the WISE reporting system. Data labels in the WFD graphs indicate the number of water bodies impacted by each pressure per broad geographic type.
- HD pressure data shows the eight-most frequently reported level 2 pressures across the broad geographic type. Data labels in the HD graphs indicate the number of habitat types impacted by each pressure per broad geographic type.

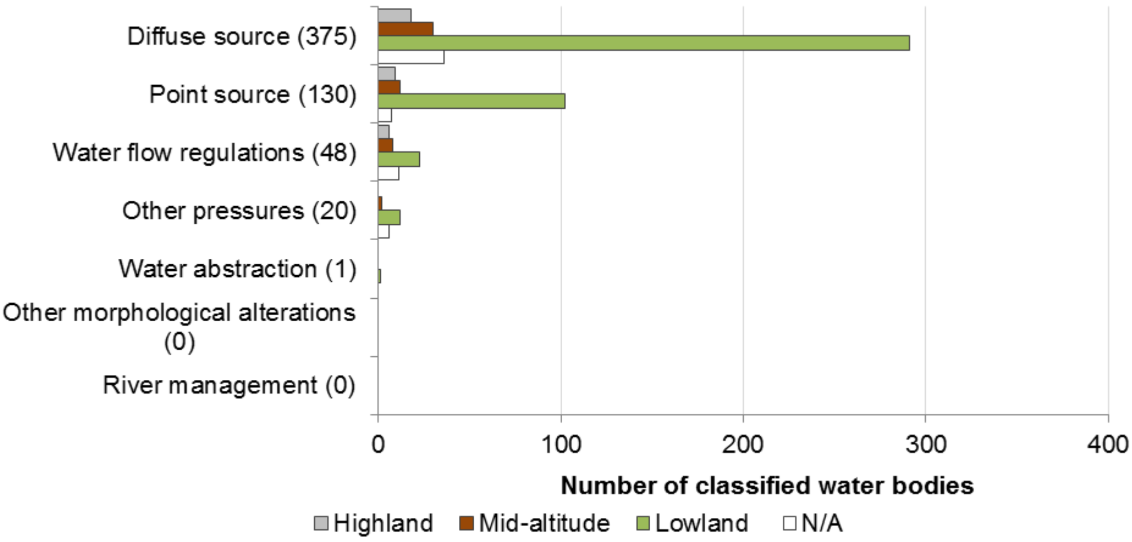
Similar national Article 17 reports have been published by Italy & others (ETC-BD web-portal), http://bd.eionet.europa.eu/activities/Reporting/Article_17/Reports_2007/chapter7

7.3.3 Example 1 – Germany

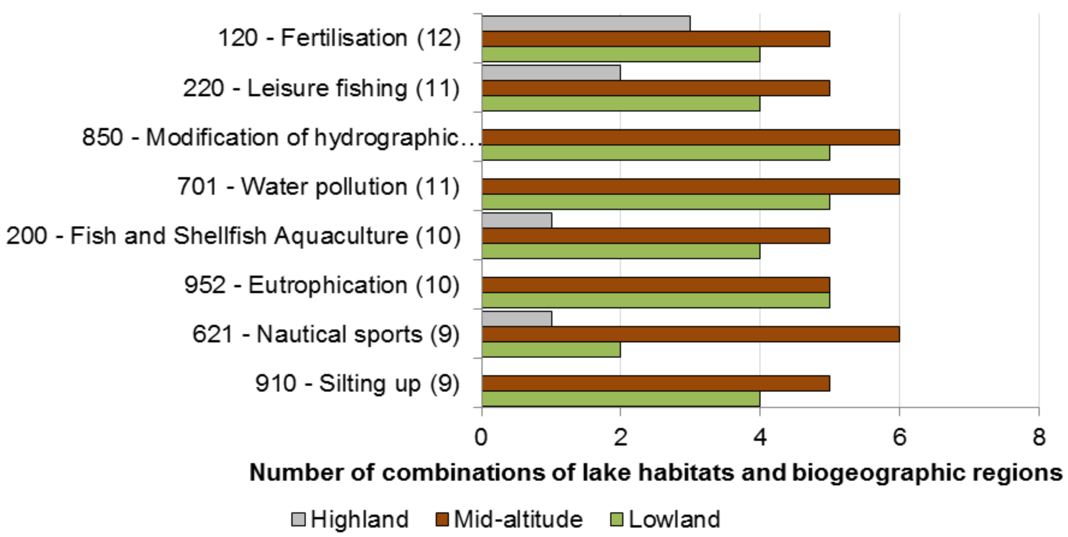
In Germany, the WFD and HD reporting for lakes and rivers provide a harmonious representation of the key pressures affecting freshwater habitats. According to the pressures reported in the 1st RBMPs under the WFD, the ecological status of German lakes is mainly affected by the following significant pressures: water flow regulations, diffuse source pollution, point source pollution and other pressures (Figure 7.4) (BMU/UBA 2010). In the German HD reporting (2001-2006), most lakes were evaluated as having a bad or inadequate conservation status. The top pressures reported for lakes were fertilisation, leisure fishing, modification of hydrographic functioning, and water pollution (Figure 7.4) (BMU/UBA 2010). For diffuse source pollution, the HD reporting provides a more detailed picture of the underlying pressures (e.g. fertilisation, eutrophication, silting up) than does the WFD.

Figure 7.4 WFD and HD pressures reported for German lakes.

a) WFD – DE - Lakes



b) HD – DE – Lakes

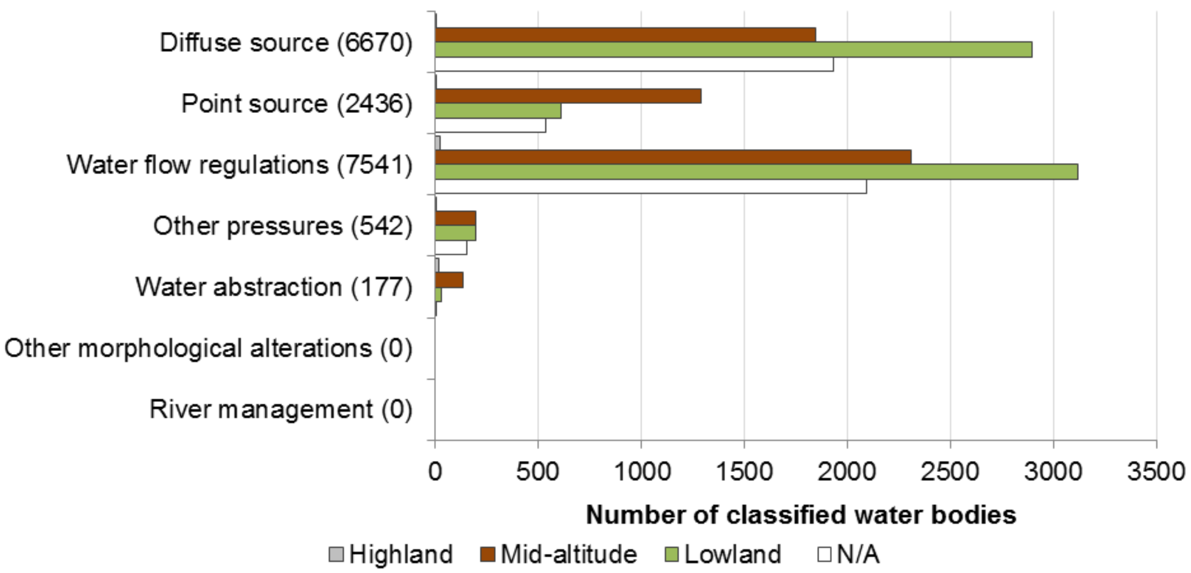


Notes: WFD level 1 pressures were reported for 407 out of 680 lakes (56%) in Germany.) The category N/A includes WFD national water body types that could not be translated into a broad altitude type (see Annex 7).

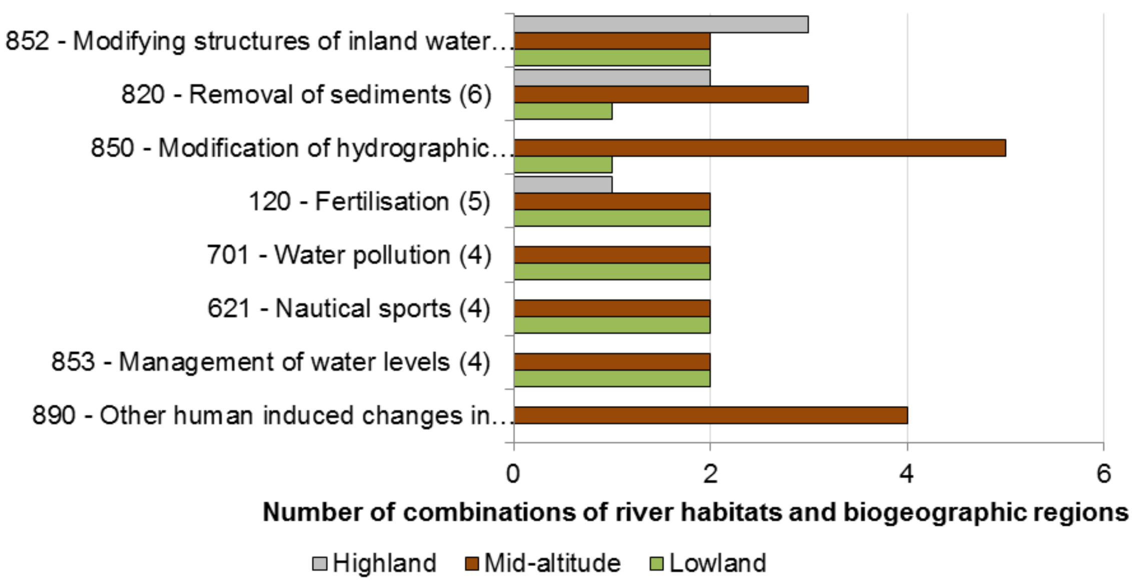
According to the 1st RBMPs, the status of German rivers (see Figure 7.5) is affected primarily by the following significant pressures: water flow regulations and morphological alterations, diffuse and point source pollution. In the context of the HD reporting (2001-2006), most German rivers were assessed to be in a poor conservation status. According to the HD reporting, rivers are subjected to similar pressures as those reported under the WFD RBMPs.

Figure 7.5 WFD and HD pressures identified for German rivers.

a) WFD-DE- Rivers



b) HD – DE - Rivers

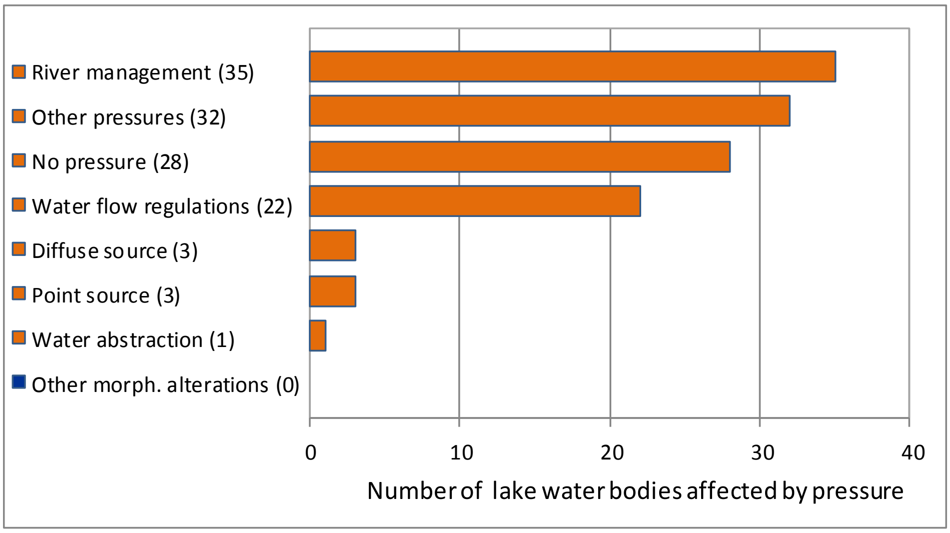


Notes: WFD level 1 pressures were reported for 8099 out of 8817 rivers (92%) in Germany.) The category N/A includes WFD national water body types that could not be translated into a broad altitude type (see Annex 7).

7.3.4 Example 2 – Hungary

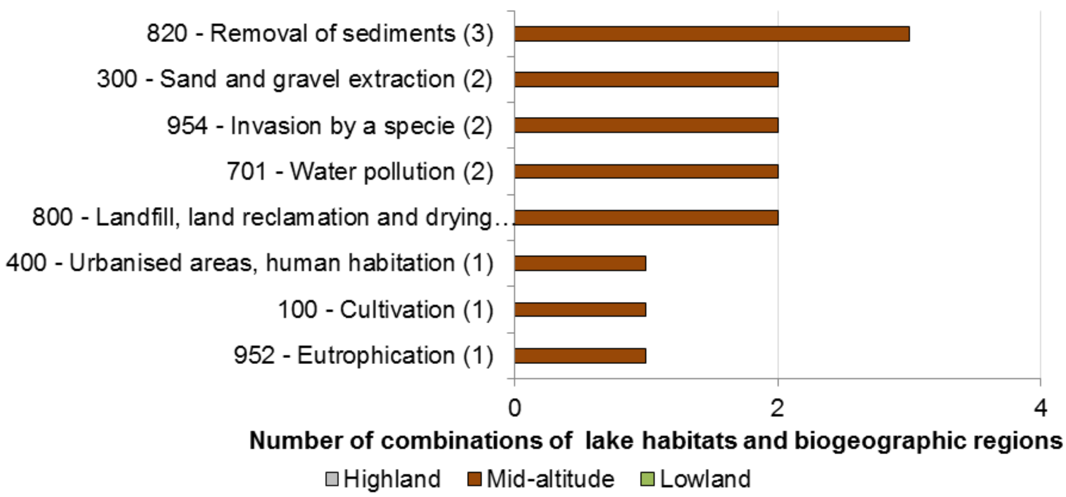
The main pressures reported for Hungary under the WFD and HD for lakes and rivers were very similar. Only 36% of lake water bodies were classified according to the WFD. Of the classified lake water bodies in Hungary, the dominant pressures are river management, water flow regulations and other pressures, which corresponds well with the pressure types reported under the WFD (figure 7.6) and the HD (figure 7.7). In Figure 7.7, the most frequently reported pressures across the broad geographic zones were counted for the habitat areas in Hungary using the combined highland/midland broad type, which is the only common broad type used in the assessment for other biogeographical regions. The reported HD pressures are listed in Annex 8 for the two river related habitats (Habitat codes: 3260 and 3270) and three lake related habitats (3130, 3150 and 3160).

Figure 7.6 WFD pressures identified for Hungarian classified lake water bodies.



Notes: 76 out of 213 lake water bodies were classified. Numbers in parenthesis indicate the number of affected water bodies.
Source: WISE WFD Database

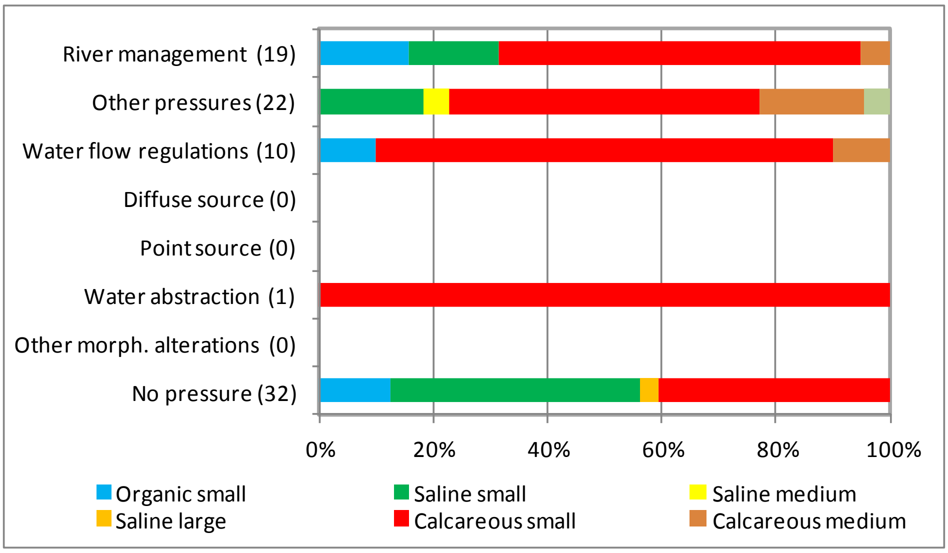
Figure 7.7 HD pressures identified for Hungarian lakes.



Notes: HD pressures were reported for 3 out of 3 (100%) lake habitat and bio-region combinations in Hungary. Numbers in parenthesis indicate the number of affected combinations of lake habitats and biogeographic regions.

WFD pressure data for the major national types of lake water bodies show that there are no point or diffuse source pressures or other morphological alterations in the classified Hungarian lakes (Figure 7.8). Most of the pressures are reported for Calcareous small lakes. Only a few Saline medium lakes are affected, while no pressure was identified on Saline large lakes.

Figure 7.8 Percentage of classified lake water bodies affected by different WFD pressures for water bodies in major national Hungarian WFD types.



Notes: Numbers in parenthesis indicate the number of affected lake water bodies.

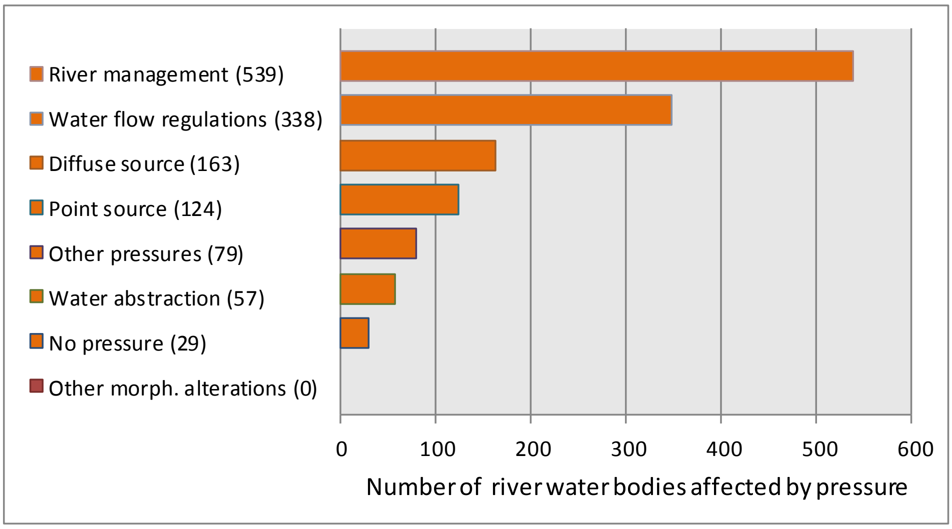
Results from the 1st RBMP showed that the pressures reported to affect most river water bodies in Hungary are river management, water flow regulations, while the third most frequent pressure is pollution from diffuse sources causing nutrient enrichment (Figure 7.9). A total of 67% of the river water bodies were classified, and only 5% had no pressures.

Results from reporting under the HD indicate that river habitat types are affected by either modification of hydrographic functioning, removal of sediments, dumping and depositing of dredged deposits, water pollution, which all could be connected to WFD pressure types (Figure 7.10).

As it was mentioned in section 3, the most common river habitat in the Pannonian region is the "3270 Rivers with muddy banks". This habitat type is mainly located alongside main rivers, which have medium-fine river bed material or substratum. Rivers with muddy banks could be well characterized by the middle-fine bed material category of river typology, which is relevant to all major national river types used in this case study, except RBT1 Highland small, RBT2 Highland medium and RBT6 Midland very large.

Figure 7.11 shows that pressures from river management, water flow regulations and diffuse source pollution affect roughly the same number of midland and lowland water bodies. Point source pressures affect 29 river water bodies, mainly lowland types (55%), but also some small-medium midland rivers (35%). Half of the river water bodies without pressures are found in the highland areas and 25% are lowland very large rivers.

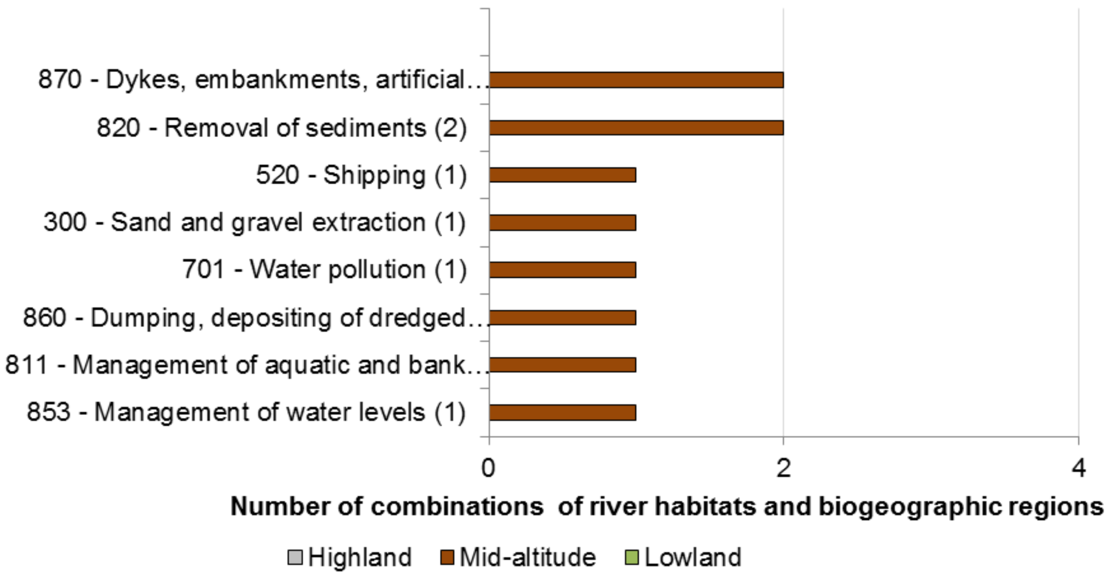
Figure 7.9 WFD pressures identified for Hungarian classified river water bodies.



Notes: 584 out of 869 river water bodies were classified. Numbers in parenthesis indicate the number of affected water bodies.

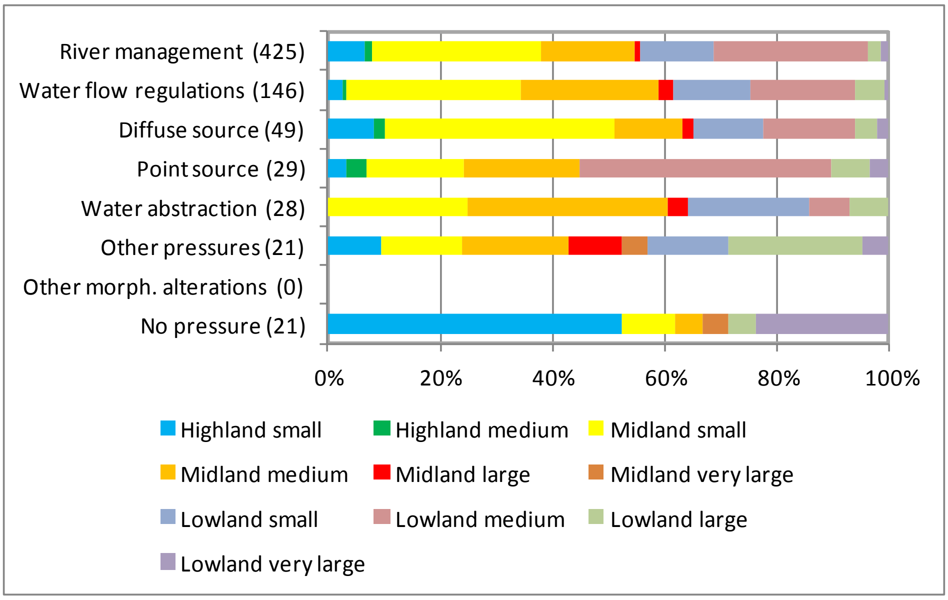
Source: WISE WFD Database

Figure 7.10 HD pressures identified for Hungarian rivers.



Notes: HD pressures were reported for 2 out of 2 (100%) lake habitat and bio-region combinations in Hungary. Numbers in parenthesis indicate the number of affected combinations of lake habitats and biogeographic regions.

Figure 7.11 Percentage of classified river water bodies affected by different WFD pressures for water bodies in major national Hungarian WFD types.



Notes: Numbers in parenthesis indicate the number of affected water bodies.

Source: WISE WFD Database.

7.3.5 Example 3 – Ireland

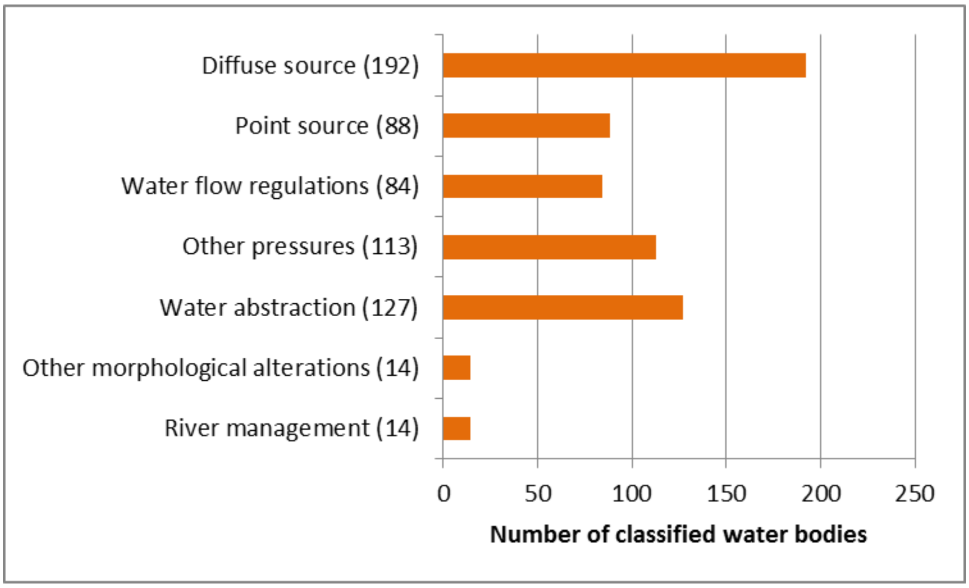
Both WFD and HD reporting systems revealed that Irish lakes and rivers were more often impacted by land use pressures (e.g. diffuse source pollution and other pressures) than by water flow regulations or other morphological alterations.

According to the pressures reported in the 1st RBMPs under the WFD, the ecological status of Irish lakes is mainly affected by the following significant pressures: diffuse source pollution, point source pollution; water abstraction and river management (see Figure 7.12). Based on the HD reporting (2001-2006), the conservation status of most Irish lake habitats is considered to be bad. Pressures from grazing and general forestry management were reported more often than other land use pressures, such as fertilization, pollution, and drainage (see Figure 7.12). Further pressures include the introduction of invasive alien species, peat extraction, and hand cutting of peat (National Parks and Wildlife Service, 2008).

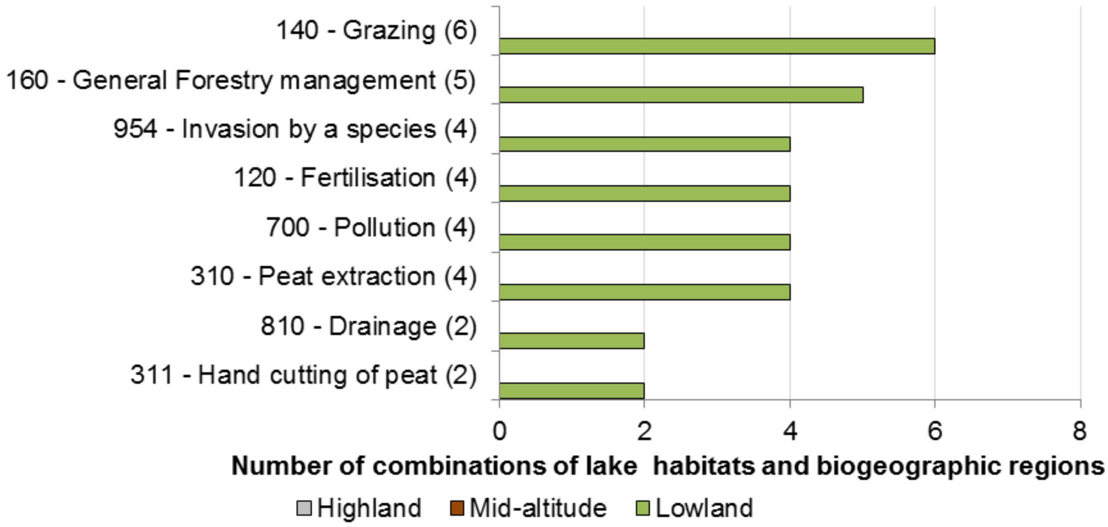
According to the pressures reported in the 1st RBMPs under the WFD, the ecological status of Irish rivers is mainly affected by the following significant pressures: diffuse source pollution; point source pollution and river management (e.g. physical alteration of channel, engineering activities, agricultural enhancement and land infrastructure) (see Figure 7.13). According to the HD reporting (2001-2006), the conservation of most Irish rivers is considered to be bad. The main threats affecting Irish rivers are eutrophication, overgrazing, excessive fertilization, afforestation and introduction of invasive species (see Figure 7.13) (NPWS 2008).

Figure 7.12 WFD and HD pressures identified for Irish lakes.

a) WFD – IE – Lakes



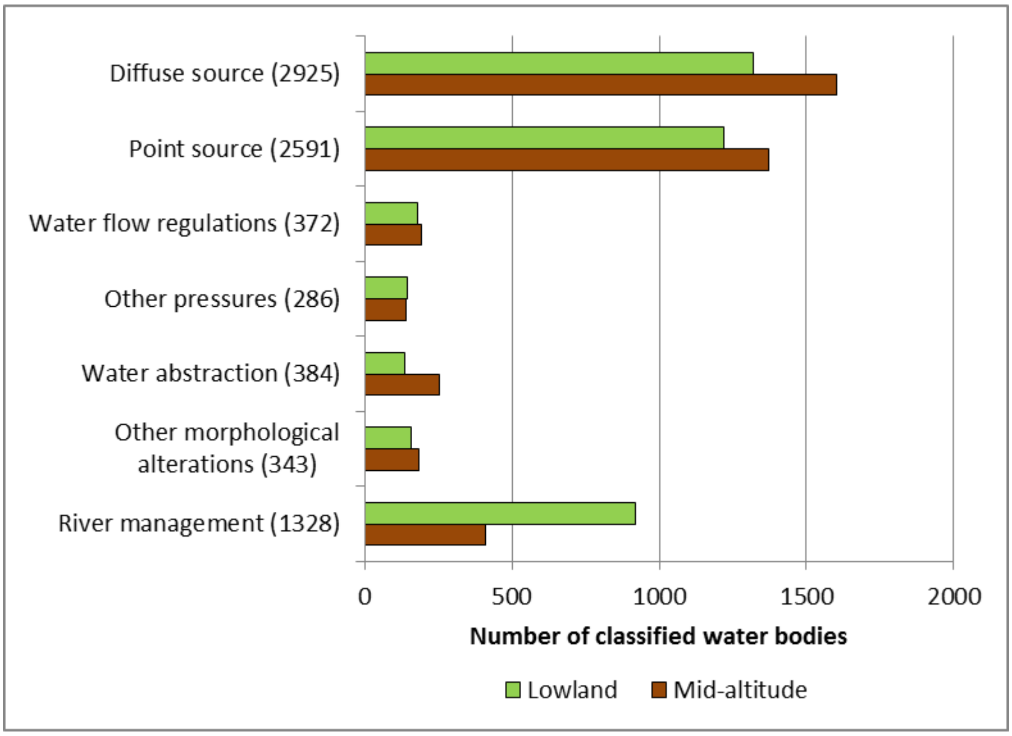
b) HD – IE – Lakes



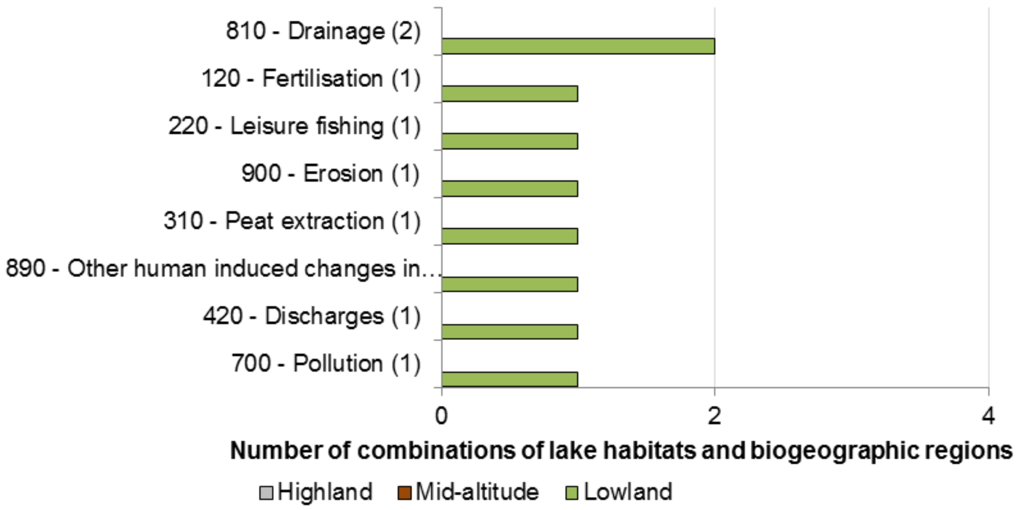
Notes: WFD level 1 pressures were reported for 350 out of 800 lakes (44%) in Ireland. Some of the WFD national water body types could not be translated into a broad altitude type (see Annex 7).

Figure 7.13 WFD and HD pressures identified for Irish rivers.

a) WFD – IE – Rivers



b) HD – IE – Rivers



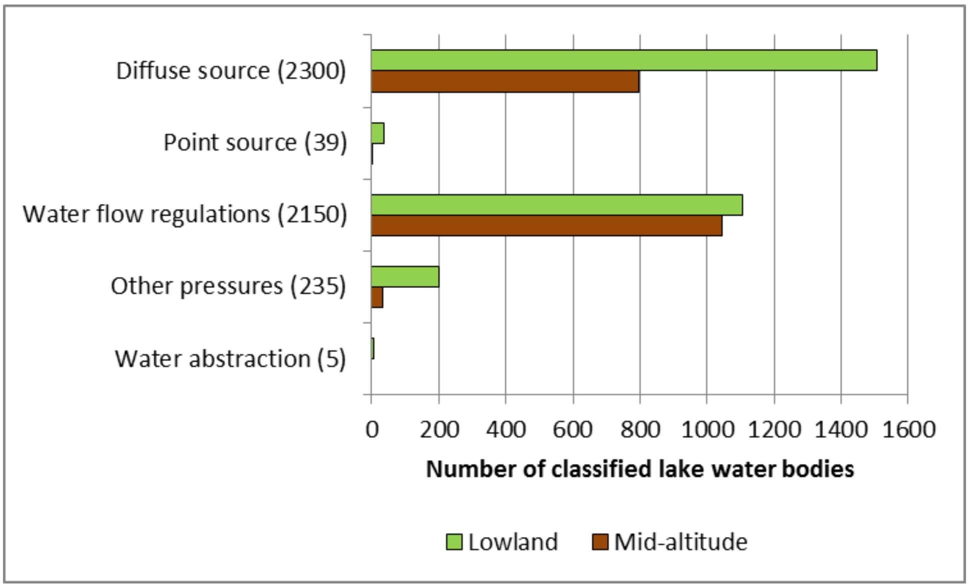
Notes: WFD level 1 pressures were reported for 3268 out of 4508 rivers (73%) in Ireland.) The category N/A includes WFD national water body types that could not be translated into a broad altitude type (see Annex 7).

7.3.6 Example 4 – Sweden

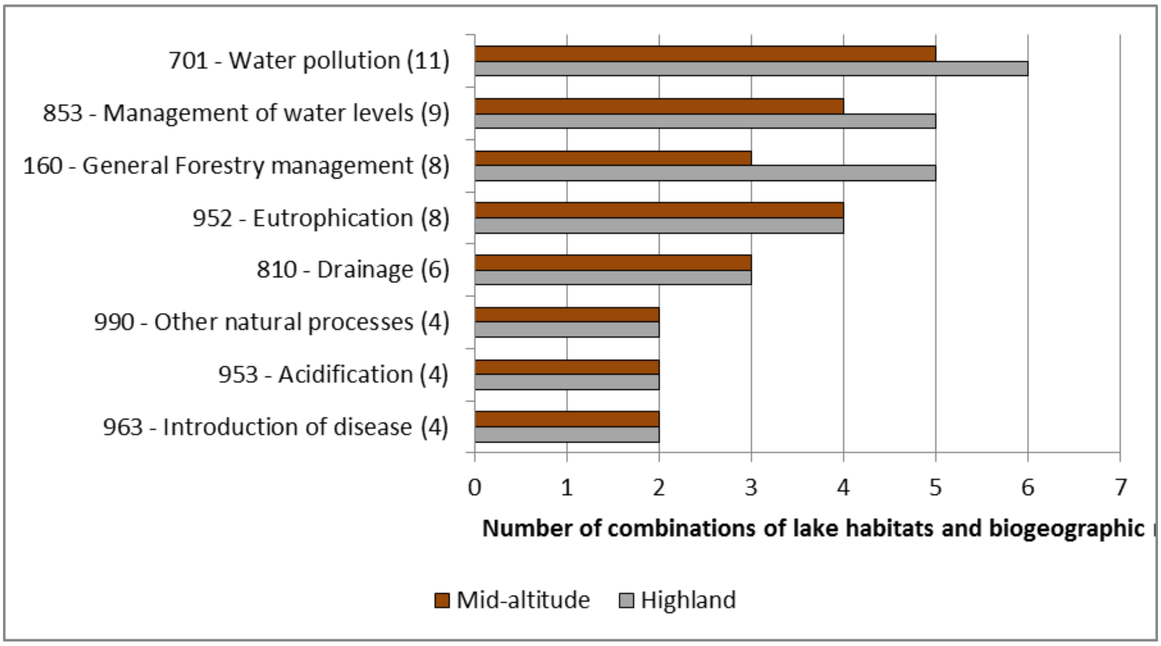
In the case of Swedish lakes, the WFD and HD pressures reporting provide a similar view of the most frequently-occurring pressures (Figure 7.14).

Figure 7.14 WFD and HD pressures identified for Swedish lakes.

a) WFD – SE – Lakes



b) HD – SE – Lakes

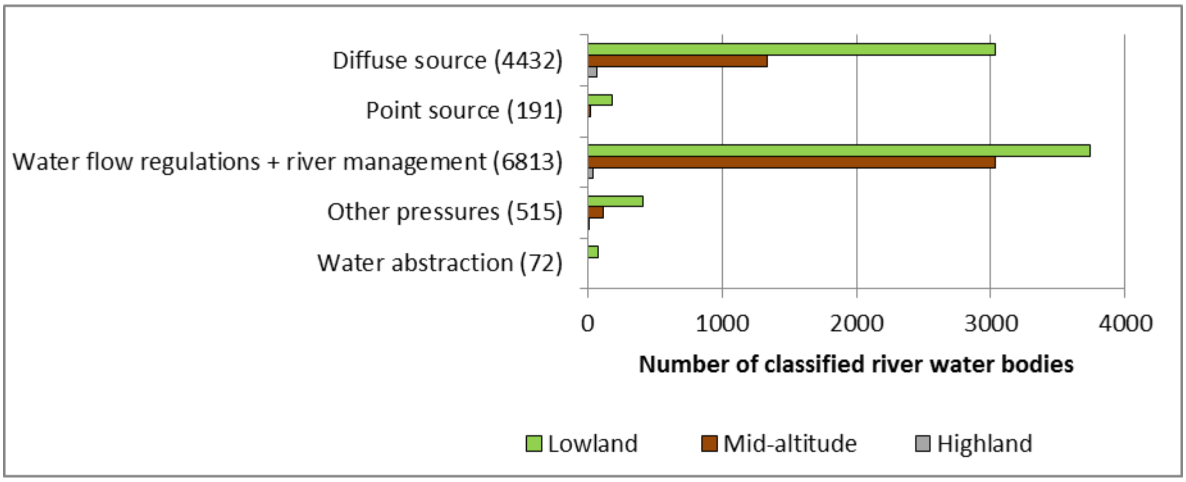


Notes: WFD level 1 pressures were reported for 3688 out of 7193 lakes (51%) in Sweden, excluding those with only mercury pollution (ETC-ICM 2012). HD pressures were reported for 14 out of 14 (100%) lake habitat and bio-region combinations in Sweden. The lack of the lowland category for the HD habitats may be due to an error in the raw data (Annex 7).

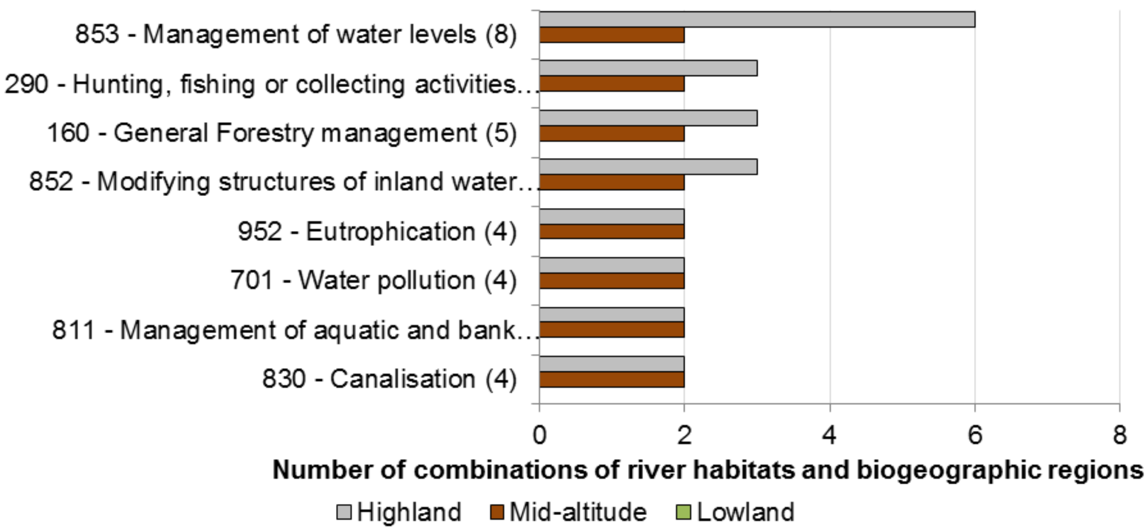
In the 1st RBMPs under the WFD, pressures were reported for all Swedish lakes. Swedish lakes were mostly influenced by diffuse source pollution and water flow regulations (Figure 7.14). For diffuse pollution, the large majority of lakes were only affected by diffuse mercury pollution (ETC-ICM, 2012). Lakes that only have mercury pollution have been excluded, as that pressure does not affect ecological status, only chemical status (see the approach used in the ETC-ICM 2012). As with the pressures reporting for German and Irish lakes, the HD reporting for Swedish lakes revealed a more detailed distribution of other pressures, including: general forestry management, eutrophication, and drainage. The top HD pressures impacting Swedish lakes are water pollution and management of water levels (Figure 7.14). The lack of the lowland category for the HD habitats may be due to an error in the raw data.

Figure 7.15 WFD and HD pressures identified for Swedish rivers.

a) WFD – SE – Rivers



b) HD – SE - Rivers



Notes: WFD level 1 pressures were reported for 9024 out of 15459 rivers (58%) in Sweden, excluding those with only mercury pollution (ETC-ICM 2012, see text above). HD pressures were reported for 8 out of 8 (100%) river habitat and bio-region combinations in Sweden. The lack of the lowland category for the HD habitats may be due to an error in the raw data.

WFD pressures were reported in 58% of Swedish rivers. As with Swedish lakes, Swedish rivers were most frequently impacted by diffuse source pollution and water flow regulations in the 1st round of the RBMPs under the WFD (Figure 7.15). Rivers that were only affected by diffuse mercury pollution were excluded from the analysis (ETC-ICM 2012), as that pressure does not affect ecological status, only chemical status (see the approach used in the ETC-ICM 2012). According to HD threats data, management of water levels and modifying structures of inland water bodies were more frequent than water pollution and eutrophication (Figure 7.15).

8 Conclusions on the WFD and HD comparison of types, status and pressures

8.1 Conclusions of the broad types definition and the cross-walk between the WFD and HD/EUNIS types

- The most commonly used typology factors for rivers and lakes are:
  - Rivers: Altitude, Catchment Area, and Geology.
  - Lakes: Altitude, Surface Area, Mean Depth, Geology/Alkalinity.
- The outcome of the grouping of national river types and lake types across the most frequently used type factors suggests that many types have a 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). These broad types could be useful for European assessments (Tables 3.11 and 3.13).
- The current set of broad types include 87% of WFD river water bodies and close to 600 national WFD river types and 73% of WFD lake water bodies and close to 300 national WFD lake types in Europe (excluding Denmark and Spain, see chapter 3.2.3).
- Some of the large lakes and large rivers do not appear in the broad type for large lakes or large rivers, because many Member States split these into several smaller water bodies.
- Many small streams and ponds that are below the size thresholds used by the countries for WFD purposes are merged into larger river water bodies, and are thus "hidden" within the other broad types (see also section 3.2.5 below), although there are some countries using separate national types for very small water bodies.

The conclusions of the cross-walk between the WFD and the HD/EUNIS types are:

For rivers:

- There is a reasonable match between the WFD broad types, the WFD IC types and the HD types for Alpine rivers and Mediterranean rivers (Table 3.15)
- For the other main lowland and mid-altitude regions there is a reasonable match between the broad types and the WFD IC types, but not such a good match with the HD/EUNIS types (Table 3.15).
- The two most common river habitat types, the HD type 3260 rivers from plain to montane levels, and 3210 Fennoscandian rivers, are too wide to be linked to any of the broad types nor to any of the WFD IC types (Tables 3.15 and 3.17). These habitat types may not be very useful for assessing the status of European rivers.
- There are also some EUNIS river habitats that are too narrow or specific to match any of the WFD types, nor any of the broad types.

For lakes:

- There is in general a good match between the WFD broad types and the IC types, as well as with the HD/EUNIS habitat types (Table 3.16).
- For Mediterranean lakes the WFD IC types do not match the HD types due to the WFD types being restricted to large and deep reservoirs, whereas the HD types are either small natural eutrophic lakes or temporary ponds.
- For certain specific HD /EUNIS habitat types there are no matching WFD types (Table 3.17).

8.2 Conclusions of cross-walking of the WFD and HD status reporting

- The crosswalk of WFD and HD status reporting can only be done at country level due to non-comparable methods for assessing conservation status. In this report four countries were included, Sweden, Germany, Hungary and Denmark:
  1. The overall status picture for Swedish rivers is quite consistent for the two directives for comparable types: Best status in the Alpine region, intermediate in the Boreal region corresponding to Northern Sweden and worst in the Continental region corresponding to the Southernmost Swedish rivers.
  2. For German rivers, the majority of the river habitats in the Continental and Atlantic regions have bad conservation status, which corresponds well with the poor WFD status reported for comparable WFD types. HD results for Alpine streams do not correspond well with the WFD results, but there is better correspondence for rivers of the Alpine foothills.
  3. For Hungary, there is relatively good consistency between the WFD status and the HD status for both rivers and lakes in comparable types/habitats, where water bodies in a moderate or poor ecological status correspond to the inadequate deteriorating conservation status for related habitats.
  4. For Denmark, there is reasonable consistency between the ecological status of small and very small rivers where 50% are in less than good status and the inadequate conservation status reported for the related habitat, rivers from plain to montane levels. The other river habitat occurring in Denmark (Rivers with muddy banks) cannot be compared, as the conservation status is not reported.
- The comparison of ecological status of both river and lake water bodies associated with the Natura 2000 sites with that of all water bodies shows that the status in Natura 2000 sites is slightly better than for all water bodies in most Member States. This is consistent with the expectation that there should be fewer pressures in the Natura 2000 sites than elsewhere. At the EU level for rivers, 57% of the water bodies within the Natura 2000 sites are in a good or better status, while only 44% are in a good or better status for all river water bodies. For lakes the difference at the EU level is even larger, with 71% of the water bodies within the Natura 2000 sites in a good or better status, while only 58% are in a good or better status for all lake water bodies. Several calcareous lake types are an exception, having worse ecological status when associated with Natura 2000 sites than the overall status for all water bodies within those types.
- The differences found for the ecological status of rivers and lakes between biogeographic regions is consistent with the results found for the ecological status in different RBDs/countries in the ETC 2012 and EEA 2012 reports: Rivers and lakes in the Alpine and Boreal areas of Europe are in a better status than those in other parts of Europe.
- Thus, in summary, these results suggest that the status assessment of the two directives seems to match for most of the countries and most of the broad WFD types that can be related to freshwater habitats, although there are particular types and habitats that do not match. The reasons for mismatching need further exploration.
- The ecological status of rivers and lakes aggregated to broad types show best status for water bodies in highland or mid-altitude areas with siliceous geology and worst status for small water bodies in lowland areas with calcareous geology, which is consistent with the different pressure intensities. The large and deep lakes are mostly in a good ecological status, while the large rivers are mostly in a moderate or worse status. This difference between large rivers and large deep lakes probably reflects the different pressure intensities (see chapter 4) and also the much better recipient capacity of large deep lakes due to their large water volumes.

8.3 Conclusions of cross-walking the WFD and HD pressures reporting

The examples of Member States' reporting above indicate that there is still room for improvement in the pressures reporting streams under the WFD and HD reporting systems for rivers and lakes. The following lessons were learned:

- Similar to the typology cross-walking exercise of types and status in section 2.6 and 3, respectively, the comparison of pressures reporting for the WFD and HD revealed that there is a reasonably good match between the most commonly reported pressures and pressures distribution in the broad geographic zones in Germany, Hungary, Ireland, and Sweden.
- Both reporting streams painted a similar picture of the most commonly occurring pressures within each country. The analysis revealed that the most common pressures in lakes and rivers were diffuse source pollution, point source pollution, and morphological alterations. Diffuse source pressures, fertilisation, and water pollution were reported more evenly across the three broad geographic zones than the other pressures.
- The more precise level of detail captured by the HD threats reporting system provides more insight into the exact pressures affecting freshwater habitats.
- Analysing WFD pressures data within a country yields a clearer picture of the relative presence/absence of specific pressures in freshwater habitats (as shown in the Hungarian example).
- Unlike the WFD pressure data, which could be more accurately matched to broad geographic types, the HD pressure data for freshwater habitats in a specific bio-region could not be assigned to more than one broad type, which limited the comparisons that could be drawn between broad types.
- Differences in the resolution of the pressures data makes it difficult to determine a precise spatial distribution of the pressures in question. The WFD reports pressures for individual water bodies, while the HD reports pressures for habitat types. Most of the freshwater water bodies in each country were reported to be impacted by more than one pressure according to the WFD. However, according to the HD pressures data, 100% of all freshwater habitat types were impacted by more than one pressure.
- As mentioned in chapter 2.7.1, the inclusion of HMWB in the WFD reporting but not in the HD reporting may influence the different patterns observed when comparing pressures reporting between the WFD and HD for lakes and rivers. For example, the HD pressures analysis generally showed pressures like general forestry management, nautical sports, and fishing activities, which may be linked to the greater habitat or conservation value of HD water bodies compared to HMWB in the WFD.
- The possible inclusion of small waterbodies in the HD reporting but not in the WFD reporting may influence the trends observed. This is likely the case for HD pressures reporting in Irish lakes, where hand cutting of peat, peat extraction, and drainage were among the top eight most frequently reported pressures.
- Analysing pressures data for the HD would provide a more useful picture of how the type and distribution of pressures changes with the size of freshwater habitats. Examining pressures unique to German lowland rivers (see section 7.2) reveals that other pressures become more frequent (e.g. shipping, grazing, modification of aquatic and bank vegetation) than shown by the analysis of all broad geographic types together. Because it was impossible to attribute water body sizes to the HD habitats, this tendency could not be illustrated with HD data.
- Using WFD pressures data to focus-in on the size of freshwater habitats within a particular broad geographic region did not reveal a new ranking of pressures. This is due to the numerical abundance of streams and rivers, compared to large rivers and very large rivers.

9 Measures

9.1 Introduction

Since many aquatic habitats and species of the HD are related to WFD water bodies or water types, the measures proposed under the HD and the WFD may partly be the same.

Certainly, there are also differences in the objectives, scope and scale of application of measures under the two different directives. The WFD RBMPs include mitigation measures to improve ecological status of water bodies (bearing effects and impacts on catchment scale in mind), while restoration measures under the HD are required for improving the conservation status of habitats and species.

Nonetheless, there are indeed many synergies as the implementation of measures under the WFD will generally benefit the objectives of the nature directives and vice versa. Therefore, there is a need for coordination between the responsible authorities for nature conservation and water management.

9.2 Key measures with joint benefits for water management and nature protection

The following Table 9.1 illustrates the key categories of measures targeting freshwater habitat pressures, with joint benefits for water management (WFD and other water directives) and nature protection. The table also indicates the relevance of these measures for the conservation of a selection of freshwater species appearing in the Annexes II and IV of the Habitats Directive (see last column on the right-hand side). The species indicated in the tables are mainly fish, insects, amphibians, reptilians and mammals (plant and bird species have not been considered in this selection).

For instance, WFD measures that aim at restoring longitudinal continuity and ensuring the migration of fish such as the salmon and the sturgeon (e.g. fish passes and removal of barriers) have a direct linkage to and benefits for the conservation status of migratory fish listed under the Habitats Directive.

At the same time, there are several species of fish, amphibians, insects and small mammals whose conservation status can benefit from the increased productivity in floodplain habitats and backwaters which result from the implementation of WFD measures targeting the restoration of natural dynamic river and floodplain processes at a large scale.

Table 9.1 Key measures to address freshwater pressures and provide joint benefits for water management and nature protection.

Measures (groups of measures)	**Pressures**	**Relevance to key Freshwater habitat types**	**Benefits for water management (WFD, other directives)**	**Benefits for nature protection**	**Relevance to Annex II and IV FW species of the HD (*selection*)**
Removing barriers **Fish passes** and other measures to ensure upstream and downstream fish migration	Interruption of longitudinal continuity Barriers (dams, reservoirs, locks, weirs)	Alpine streams Highland/midland rivers Highland/midland streams Mediterranean rivers	Restore longitudinal continuity Enhancement of fish populations to reach GES/GEP	Improvement of habitat connectivity between natural areas (counteracts habitat fragmentation) Improvement of conservation status for migratory fish, e.g. salmon, sturgeon, eels	Migratory fish (diadromous and potadromus fish)
Room for rivers (removing dykes and allowing rivers more room to periodically flood)	Interruption of lateral continuity (dykes) Physical alteration of channel Channelization/straightening Bank reinforcements	Lowland very large rivers Lowland medium-large rivers Lowland streams	Improvement of hydromorphological status, habitat improvement for several BQEs Flood protection	Provision of room for key habitats (wetlands, floodplains)	Fish, amphibian and mamalian species that benefit from increased productivity in floodplain habitats / backwaters
Establish **ecological flow**	Flow regulation Barriers (dams, reservoirs, locks, weirs) Abstractions Hydropeaking	Alpine streams Highland/midland rivers Highland/midland streams Lowland medium-large rivers Lowland streams Mediterranean rivers/streams	Improvement of the flow regime, effects on hydromorphological status (e.g. reduced siltation), support of river continuum, improvement of habitats for BQEs depending on flow, e.g. fish	Improvement of habitat connectivity, return to more natural state of habitats adversely affected by changed flow regime	Rheophilic fish and invertebrate species that would benefit from increased minimum flows and faster flow conditions associated with reservoir releases and artificial flooding

Floodplain reactivation and **riparian zone** rehabilitation, incl. re-meandering, reconnection of backwaters	Interruption of lateral continuity (dikes) Physical alteration of channel Channelization/straightening Bank reinforcements Land infrastructure Agricultural enhancement	Lowland very large rivers Lowland medium-large rivers Lowland streams	Improvement of the link between the river and its floodplain Provision of cover and shallow areas for macrophytes, fish, benthic invertebrates (possible improvement of BQEs)	More natural conditions which produce better quality and more numerous habitats for aquatic (macrophytes, benthic invertebrates and fish) and terrestrial species Large parts of floodplains are designated Natura 2000 sites	Fish, insect, mammalian, reptilian, and amphibian species that rely on floodplain habitats or riparian zones for feeding, reproduction, etc. Direct benefits to these species include habitat provision or improved food resource availability
(Instream) **habitat restoration**, e.g. instream structures, gravel bars & riffles, removal of bed fixation, reduction of dredging, bank enhancement	Physical alteration of channel Channelization/straightening Bank reinforcements Sediment extraction or input	Lowland medium-large rivers Lowland streams	Improvement of hydromorphological status (self-dynamic development of structural elements) and local improvements of BQEs to reach GES in specific stretches	Can have positive local effects on specific protected habitats and species in the aquatic environment	Fish species with a rheophilic flow preference that also belong to lithophilic / psammophilic spawning guilds. These species benefit from the provision of nursery and spawning habitats created by instream restoration measures
Buffer strips Establishment of buffer strips.	Diffuse pollution Agricultural enhancement Bank reinforcements	Lowland medium-large rivers Lowland streams Mediterranean rivers/streams	Water quality improvement (Filtration of nutrients and reducing run-off) Improvement of hydromorphological status of riparian zone	(Re-)Creation of natural habitats in areas strongly developed for agriculture Provision of favourable conditions for certain terrestrial and semi-aquatic species	Fish, mammalian, insect, reptilian, and amphibian species that use riparian ecotones to feed or reproduce
Sediment-related measures, e.g. remove (fine or contaminated) sediment, add sediment, activate sediment connectivity	Sediment extraction (dredging) or input Interruption of longitudinal continuity Barriers	Alpine streams Highland/midland Lowland very large rivers Lowland medium-large rivers Lowland streams Mediterranean rivers/streams	Increase of the diversity of riverine environment and enhancement of habitats, especially for fish and benthic invertebrates Improvement of bed (hydromorphology)	In combination with other measures, sediment-related measures can enhance the status of certain aquatic habitats and species	Fish and invertebrate (mussel) species that are sensitive to habitat degradation by sediment dredging or the clogging of gravel spawning substrate due to inputs of fine sediment

Prevention measures for the spread of **invasive species** into new areas **Control measures** (e.g. herbicides for plants)	Invasive non-native species	Alpine lakes Highland/midland lakes Lowland very large rivers Lowland medium-large rivers Lowland lakes	Achieve GES, ensure non-deterioration Protection of affected structures (e.g. flood defense works)	Contribute to favourable conservation status of Natura 2000 sites	Crustacean (crayfish), fish, invertebrate and amphibian species that have a severely restricted range and are highly susceptible to the pressures associated with invasive species (e.g. disease, competition, predation)
Increasing soil and landscape water retention and groundwater recharge	Soil compaction due to intensive agriculture Land infrastructure Deforestation	Lowland very large rivers Lowland medium-large rivers Lowland streams Mediterranean rivers/streams	Reduction of floods Reduction of droughts Achievement of GES	Contribute to the improvement of aquatic habitats	Amphibian, reptilian, and mammalian species that would benefit from improvement to floodplain habitats (e.g. benefit from wetland creation or increased inundation of backwater habitats/floodplain)
Restoration of wetlands and forests *This measure category is partly a repetition of room for the river – It may focus on restoring wetlands* *And a separate row on restoring floodplain forest.*	Interruption of lateral continuity (dikes) Physical alteration of channel Channelization/ straightening Bank reinforcements Land infrastructure Agricultural enhancement	Lowland very large rivers Lowland medium-large rivers Lowland streams	Improvement of hydromorphological status Achievement of GES	Improvement of habitat connectivity between natural areas (counteracts habitat fragmentation)	Mammalian, amphibian, and reptilian species that would benefit from improvements to riparian forests and wetlands

9.3 Case studies illustrating joint benefits of measures

The following is a selection of illustrative examples of the implementation of measures in different parts of Europe, that have had beneficial effect both in terms of water management (river restoration, flood protection etc.) and nature protection (e.g. establishment or conservation of protected areas).

Box 9.1 River Skern (Denmark) – Restoration of habitats and wildlife

The River Skern LIFE-Nature project in Denmark was conceived to restore a large, continuous natural floodplain area and fulfill several objectives: 1) improve habitat for wild plants and animals, 2) enhance the self-purification capabilities and improve water quality in the river valley, and 3) flood risk alleviation. Including the planning, land acquisition, and construction periods, the project lasted from 1987 to 2002. This project restored a mosaic of meandering river with wetlands, reedbeds, meadows, and shallow lakes, affecting the lowest 20 km of the River Skern and two of its tributaries and covered an area of 22 km². These habitats were lost in the 1900s due to the channelization and straightening of the river and the cultivation of marshland, which contributed to a decrease in local biodiversity and water quality.

Extensive monitoring of the project reported a rapid succession from agricultural fields into meadows, as well as colonization of the new habitats by plants and invertebrates from upstream reaches. The area is now one of Denmark's best bird areas, providing habitat for bittern (*Botaurus stellaris*), black tern (*Childonias niger*), and corncrake (*Crex crex*). European otters (*Lutra lutra*) have also re-inhabited the area. The new spawning grounds and nursery habitats for Atlantic salmon (*Salmo salar*) and lavaret (*Coregonus laveretus*) will help these species to re-establish local populations. By increasing water retention, these new habitats provide natural flood protection and have also reduced the leaching of nitrogen and phosphorus into the Rinkøbing Fjord.

Sources:

Blackwell, M.S.A. and Maltby, E. (Editors), 2005. Accessed online 08. May 2013: http://levis.sggw.waw.pl/ecoflood/contents/Guidelines%28draft_2005-10-10%29.pdf

REFORM River Restoration WIKI: http://wiki.reformrivers.eu/index.php/SkjernRestoration_of_habitats_and_wildlife_of_the_Skjern_River_%28LIFE00_NAT/DK/007116%29

Box 9.2 'Room for the River' in the Netherlands – Natural flood risk reduction measures incorporated in integrated river management planning

The area of naturally-functioning floodplain in the Rhine and Meuse rivers in The Netherlands has decreased to approximately 10% of its original extent. While the embankments and dykes that have isolated these rivers from their floodplains offer flood protection, they have also contributed to decreases in the overall environmental quality of the region. In 1993 and 1995, peak discharges in these rivers showed how severe the flooding hazards would be if these river regulation and flood control measures would fail. Thus, the 'Room for the River' Plan was adopted by the Government in 2007 with the goals to give the rivers extra room to increase safety for local residents, to cope with higher discharges due to climate change, and to improve environmental quality. By 2015, flood protection measures, like relocating dykes, deepening the summer bed, lowering minor embankments, removing groynes, etc., will be implemented at over 30 locations. These measures should also maintain the shipping use of waterways and should help to improve the ecological status of water bodies by providing a more diverse range of habitat for biota.

Sources: Room for the River Programme Website: http://www.ruimtevoorderivier.nl/meta-navigatie/english/room-for-the-river-programme/ . Accessed 08. May 2013.

Blackwell, M.S.A. and Maltby, E. (Editors), 2005. Accessed online 08. May 2013: http://levis.sggw.waw.pl/ecoflood/contents/Guidelines%28draft_2005-10-10%29.pdf

Box 9.3 Development and rehabilitation of the River Rhône in France

The modern day River Rhône lies in a very industrial valley, supplying water to a large number of people, providing nearly 25% of hydropower generated in France, and is experiencing an increase in shipping. As a result of river regulations dating back to the 18th and 19th centuries and modern pressures stemming from diverse uses, the Rhône is closed off to migratory fish and part of its length flows through man-made channels. In 1998 and 1999, actions were implemented to rehabilitate bypassed stretches of the Rhône River and their associated habitats and to restore migration routes for fish.

The measures called for in the Rhône basin management plan require the cooperation of several agencies and must also be compatible with sustaining other uses of the river (e.g., fishing, industry, power generation, transport, tourism, and agriculture). The improvements in water quality and hydromorphological integrity will help to restore the historical character of the river and provide synergies for additional improvements in the river basin (e.g., rehabilitating river banks and vegetation and protecting beavers and otters).

Source: Guidelines for Sustainable Inland Waterways and Navigation' (PIANC 2003). Accessed 08-May 2013. http://www.pianc.us/workinggroups/docs_wg/envicom-wg06.pdf

Box 9.4 River Narew (Poland) – Restoration with nature conservation benefits

Historically, the River Narew (Poland) split into multiple, interconnected, coexisting channel belts, creating numerous backwaters and oxbows. Such river systems situated on alluvial plains are referred to as 'anastomosing' in the scientific literature. They distinguish themselves by a dense network of belts of variable width and length which by turns split and join. The hydrological regime of the River Narew manifested itself by long lasting flooding and additional intensive inundation by shallow groundwater.

In the late 1970s, a reach of the River Narew was engineered. As a result, the network of multiple channel belts was replaced by one deep channel. The grasslands and meadows replaced the wetland ecosystems. Contrarily, the upstream part of the Narew River still consists of multi-channel riparian wetlands which in 1996 became a protected area called the Narew National Park. However, hydrological alterations in the regulated stretch led to a decreased groundwater level in the National Park favouring common reed expansion and shrub encroachment, causing a reduced ecosystem biodiversity.

In the early 1990s, the Polish Bird Protection Association initiated a project focused on the restoration of near-natural conditions in a so called buffer zone i.e. between the park and intensive grasslands. In the period 1996-2001 the oxbow lakes were cleared and the shrubs, mud deposits, and reeds were removed. The next step was the construction of new river channels through the Rzędziany-Pańki dyke (which is the border between park and grasslands) aiming to restore the multi-channel system. The first of two stone rapids in the main artificial channel was constructed in 2007 and the second was finished in 2010. The aim is to increase the water level in the downstream part of the park. Farmers in the surrounding area have strongly protested against the construction of rapids. The area exposed to restoration works is situated in the northern part of the NATURA 2000 PLB200001 site called the Wetland Narew Valley covering ca. 13.4 km². This area is located on the downstream border of the Narew National Park.

Source: http://www.reformrivers.eu

Box 9.5 River Vantaa (Finland) – Environmental protection in agriculture and river basin management (LIFE98 ENV/FIN/000579)

In the agricultural catchment of the River Vantaa, southern Finland, nutrients from the cultivation of field crops and urban and rural settlements create a significant nutrient load in the river system, its lakes, and finally in the Vanhankaupunginlahti Bay. The catchment area encompasses 40.000 hectares of arable land and includes 14 municipalities with approximately 1300 farms. To mitigate the harmful environmental impacts nutrient loading and to make farming practices more economically- and environmentally-sound, a sustainable development program was implemented, and local farmers were informed on the latest methods to reduce the harmful environmental impacts of the current agricultural practice. The project was financed through the LIFE program from 1998 to 2001. Farmers were given information on riparian zones to encourage their restoration, and part of the project was also dedicated to the creation of riparian zones along the Vantaa. The results of the project helped to reduce nutrient loads specific to farms in the drainage area, created riparian habitat for sensitive terrestrial, amphibian, and aquatic species, and improved the in-channel habitat quality of the River Vantaa to its mouth in the Vanhankaupunginlahti Bay.

Source:
http://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=home.createPage&s_ref=LIFE98%20ENV%2FFIN%2F000579&area=2&yr=1998&n_proj_id=1030&cfid=615886&cftoken=9524bd1657ba64b1-4296ACA0-D094-91A4-87343BEAAEFE045A&mode=print&menu=false%27%29

Box 9.6 River Toce (Italy) – Conservation of riparian habitats to support breeding and migratory birds (LIFE02 NAT/IT/008572)

The LIFE project in the Toce River sought to protect important sites for nesting birds and migrating birds, including the priority species corncrake (*Crex crex*), in the second largest tributary of Lake Maggiore, northern Italy. This broad river valley is an important ecological corridor through the Alps, and it hosts 29 birds (12 breeding), 5 fishes (including the endemic *Salmo trutta marmoratus* and *Lethenteron zanandreai*), and 11 priority bat species. As with most Italian rivers, the Toce River has pressures from bank erosion, the silting of wetlands, and the loss of native riverbank vegetation. Other threats to the areas sensitive biodiversity include reduced spawning habitat for gravel-spawning fish, vehicular access to the riverbank meadowlands, and the presence of overhead electricity lines. To protect the priority species and to restore the sensitive habitats located in the Toce River valley, extensive river and riverbank restoration measures were implemented between 2003 and 2006. Native riverbank vegetation was re-planted and non-native species were removed, ensuring the habitat value of the restored riparian zones and helping the river to combat excess inputs of fine sediment from diffuse sources. Sediment dredging was also conducted to open new habitats, and the sediments removed were partially recycled to build-up the river banks to prevent off-road vehicles from accessing the meadowlands. Additional measures, such as rehabilitated fish spawning habitat and nesting boxes for birds and bats, were implemented to ensure that the area's priority species could maintain their populations and contribute to the healthy ecological functioning of the Toce River and downstream habitats.

Source:
http://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=home.createPage&s_ref=LIFE02%20NAT%2FIT%2F008572&area=1&yr=2002&n_proj_id=1981&cfid=16440389&cftoken=3113908-000bde51-827a-1468-b5d5-839b11f70000&mode=print&menu=false%27%29

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Annex 1 Glossary

Country abbreviations:

Abbreviation	Country name
AT	Austria
BE (Fl)	Belgium (Flanders)
BE (W)	Belgium (Wallonia)
BG	Bulgaria
CY	Cyprus
CZ	Czech Republic
DE	Germany
DK	Denmark
EE	Estonia
ES	Spain
FI	Finland
FR	France
EL	Greece
HR	Croatia
HU	Hungary
IE	Ireland
IT	Italy
LT	Lithuania
LU	Luxembourg
LV	Latvia
NL	Netherlands
NO	Norway
PL	Poland
PT	Portugal
RO	Romania
SE	Sweden
SK	Slovakia
SI	Slovenia
UK	United Kingdom

ETC-ICM	European Topic Centre for Inland, Coastal and Marine Waters
GIS	Geographic Information System
HMWB and AWBs	Heavily modified and Artificial Water Bodies
RBMPs	River Basin Management Plans
WFD-CIS WG ECOSTAT	Water Framework Directive – Common Implementation Strategy – Working Group Ecostat

Annex 2 List of national WFD types linked to broad types, sorted by broad type

The national WFD types listed below are those that match one of the broad types, according to information provided by the countries and dialogue between the ETC-ICM and the countries. Denmark and Spain are excluded based on requests by Danish and Spanish WFD authorities (section 3.2.3.)

A) Rivers: Links between the broad types and 575 national types

MS = Member State (or Norway), WBs = Water bodies, Broad river type codes are described in table 3.11, and codes for Altitude, Catchment size and Geology are described in table 3.10, chapter 3.

Broad River types revised	MS	National typology	Altitude	Catchment	Geology	WBs	% within MS
1	AT	MZB_16_1,75				46	0,63 %
1	AT	MZB_16_2				30	0,41 %
1	AT	MZB_17_1,5				11	0,15 %
1	AT	MZB_17_1,75	2	5	4	190	2,59 %
1	AT	MZB_17_1,75				190	2,59 %
1	AT	MZB_18_2				5	0,07 %
1	BE (Fl)	Rzg	1	5	1	1	0,59 %
1	BE (W)	RIV_19	2	5	2	2	0,61 %
1	BG	R6	1	5	4		
1	CZ	11148	1	5		5	0,47 %
1	CZ	41147	1	5		2	0,19 %
1	CZ	41148	1	5		7	0,65 %
1	CZ	42148	2	5		2	0,19 %
1	DE	10	2	5	2	44	0,48 %
1	DE	20	1	5	2	49	0,54 %
1	DE	22.3	1	5	2	2	0,02 %
1	EE	4B	1	5	4	4	0,62 %
1	FI	Esk	1	5	4	16	1,00 %
1	FI	Esk-P	2	5	4	1	0,06 %
1	FI	ESt	1	5	3	6	0,37 %
1	FR	TG10-15/4	1	5	4	3	0,03 %
1	FR	TG14/1	1	5	4	5	0,05 %
1	FR	TG14/3-11	1	5	4	9	0,08 %
1	FR	TG15	1	5	2	5	0,05 %
1	FR	TG17/3-21	2	5	1	2	0,02 %
1	FR	TG22/10	1	5	4	2	0,02 %
1	FR	TG5/2	2	5	4	5	0,05 %
1	FR	TG9	1	5	2	3	0,03 %
1	FR	TG9/21	1	5	2	4	0,04 %

Broad River types revised	MS	National typology	Altitude	Catchment	Geology	WBs	% within MS
1	FR	TTGA	2	5	4	27	0,25 %
1	FR	TTGL	1	5	4	9	0,08 %
1	HR	HR-R_5A	1	5	4	2	0,20 %
1	HR	HR-R_5B	1	5	4	4	0,40 %
1	HR	HR-R_5C	1	5	1	2	0,20 %
1	HR	HR-R_5D	1	5	1	1	0,10 %
1	HU	14R	1	5	2	3	0,35 %
1	HU	20R	1	5	2	12	1,38 %
1	HU	23R	1	5	2	1	0,12 %
1	HU	24R	1	5	2	2	0,23 %
1	HU	25R	1	5	2	1	0,12 %
1	HU	7R	1	5	2	2	0,23 %
1	NL	R7		5		11	4,33 %
1	PL	21	1	5	2	75	1,64 %
1	PT	R_GRC	1	5	4	3	0,19 %
1	PT	R_GRN	1	5	1	1	0,06 %
1	PT	R_GRS	1	5	4	4	0,25 %
1	RO	RO12	1	5	2	2	0,06 %
1	RO	RO13	1	5	1	1	0,03 %
1	RO	RO14	1	5	1	1	0,03 %
1	RO	RO15	1	5	4	3	0,09 %
1	SI	11VA		5	2	2	1,64 %
1	SI	11VS		5	1	2	1,64 %
1	SK	D1(P1V)	1	5	4	4	0,23 %
1	SK	D2(P1V)	1	5	4	1	0,06 %
2	BE (Fl)	Rg	1	3-4	1	48	28,24 %
2	BE (Fl)	Rk	1	3	1	12	7,06 %
2	BG	R12	1	5	1	8	
2	CZ	11124	1	3		6	0,56 %
2	CZ	11125	1	3		5	0,47 %
2	CZ	11126	1	3		1	0,09 %
2	CZ	21124	1	3		1	0,09 %
2	CZ	21125	1	3		3	0,28 %
2	CZ	21126	1	3		1	0,09 %
2	CZ	31125	1	3		1	0,09 %
2	CZ	41124	1	3		9	0,84 %
2	CZ	41125	1	3		12	1,12 %
2	FI	Kk	1	3	1	275	17,17 %
2	FR	G12	1	4	1	11	0,10 %
2	FR	G18/4	1	4	1	7	0,06 %
2	FR	GM20	1	4	1	9	0,08 %
2	FR	P12-A	1	3	1	125	1,15 %
2	FR	P12-B	1	3	1	107	0,99 %
2	SE	V3LNN	1	3, 4, 5	1	291	1,87 %

Broad River types revised	MS	National typology	Altitude	Catchment	Geology	WBs	% within MS
2	SE	V4LNN	1	3, 4, 5	1	42	0,27 %
2	SE	V5LNN	1	3, 4, 5	1	1	0,01 %
2	SE	V6LNN	1	3, 4, 5	1	59	0,38 %
2	UK	4	1	3	1	99	1,19 %
2	UK	7	1	4	1	6	0,07 %
3	BE (Fl)	Bg	1	2-3	1	62	36,47 %
3	BE (Fl)	BgK	1	2-3	1	29	17,06 %
3	CZ	11114	1	2		3	0,28 %
3	CZ	21114	1	2		2	0,19 %
3	CZ	21115	1	2		1	0,09 %
3	CZ	31114	1	2		3	0,28 %
3	CZ	41114	1	2		11	1,03 %
3	FI	Pk	1	2	1	151	9,43 %
3	FR	TP12-A	1	2	1	405	3,74 %
3	FR	TP12-B	1	2	1	183	1,69 %
3	FR	TP13	1	2	1	180	1,66 %
3	HR	HR-R_3A	1	2	1	6	0,50 %
3	IE	11	1	2	1	279	6,11 %
3	IE	12	1	2	1	801	17,54 %
3	IE	13	1	2	1	361	7,91 %
3	IE	14	1	2	1	374	8,19 %
3	NO	1	1		1		
3	NO	2	1		1		
3	NO	4	1		1		
3	NO	5	1		1		
3	NO	7	1		1		
3	PL	17	1	2	1	1792	39,08 %
3	PL	18	1	2	1	299	6,52 %
3	SE	V3SNN	1	1, 2	1	610	3,92 %
3	SE	V4SNN	1	1, 2	1	141	0,91 %
3	SE	V5SNN	1	1, 2	1	3	0,02 %
3	SE	V6SNN	1	1, 2	1	104	0,67 %
3	UK	1	1	2	1	1053	12,63 %
3	UK	37	1	1	1	432	5,18 %
4	AT	MZB_13_2				25	0,34 %
4	BE (W)	RIV_21	1	3	4	1	0,30 %
4	BE (W)	RIV_22	1	3	4	14	4,00 %
4	BE (W)	RIV_23	1	4	4	3	0,90 %
4	BG	R10	1	4	1, 2	4	
4	BG	R11	1	3	1, 2	69	
4	BG	R13	1	3	1, 2		
4	BG	R7	1	4	4		
4	BG	R8	1	3	4		
4	CZ	11224	1	3		3	0,28 %

Broad River types revised	MS	National typology	Altitude	Catchment	Geology	WBs	% within MS
4	CZ	11225	1	3		1	0,09 %
4	CZ	11226	1	3		2	0,19 %
4	CZ	21224	1	3		1	0,09 %
4	CZ	21226	1	3		1	0,09 %
4	CZ	41224	1	3		6	0,56 %
4	CZ	41225	1	3		2	0,19 %
4	CZ	41226	1	3		1	0,09 %
4	DE	15	1	3	4	284	3,13 %
4	DE	17	1	3	4	93	1,02 %
4	DE	15_G	1	4	2	16	0,18 %
4	EE	2A	1	3	4	22	3,41 %
4	EE	2B	1	3	4	88	13,64 %
4	EE	3A	1	4	4	2	0,31 %
4	EE	3B	1	4	4	15	2,33 %
4	FR	G11/3-21	1	4	4	4	0,04 %
4	FR	G14/3	1	4	4	3	0,03 %
4	FR	G9	1	4	2	30	0,28 %
4	FR	G9-10/21	1	4	2	2	0,02 %
4	FR	GM14	1	4	4	13	0,12 %
4	FR	GM20/9	1	4	4	3	0,03 %
4	FR	P14	1	3	4	224	2,07 %
4	FR	P9	1	3	2	300	2,77 %
4	FR	TG11/3-21	1	4	4	1	0,01 %
4	HR	HR-R_4	1	3, 4	4	66	6,00 %
4	HR	HR-R_8	1	3, 4	4	4	0,40 %
4	HU	13R	1	4	2	8	0,92 %
4	HU	18R	1	3	2	91	10,47 %
4	IT	IT06SS3F	1	3	4	64	0,84 %
4	LT	RWT2	1	3	2	93	11,18 %
4	LT	RWT3	1	3	2	112	13,46 %
4	LT	RWT4	1	4	2	14	1,68 %
4	LT	RWT5	1	4	2	24	2,88 %
4	LU	5	1	3		9	8,33 %
4	LU	6	1	4		4	3,70 %
4	LV	R3	1	3	2	79	38,73 %
4	LV	R4	1	3	2	65	31,86 %
4	LV	R5	1	4	2	10	4,93 %
4	LV	R6	1	4	2	46	22,66 %
4	PL	19	1	4	2	271	5,91 %
4	RO	RO07	1	4	4	19	0,58 %
4	RO	RO08	1	4	4	4	0,12 %
4	RO	RO09	1	4	4	1	0,03 %
4	RO	RO10	1	4	4	6	0,18 %
4	RO	RO10*	1	4	4	40	1,23 %

Broad River types revised	MS	National typology	Altitude	Catchment	Geology	WBs	% within MS
4	RO	RO11	1	4	4	10	0,31 %
4	RO	RO11*	1	4	4	5	0,15 %
4	SE	V3LNY	1	3, 4, 5	2	4	0,03 %
4	SE	V4LNY	1	3, 4, 5	2	21	0,13 %
4	SE	V5LNY	1	3, 4, 5	2	30	0,19 %
4	SE	V6LNY	1	3, 4, 5	2	1	0,01 %
4	SK	B1(P1V)	1	4	4	7	0,41 %
4	SK	I1(P1V)	1	4	4	1	0,06 %
4	SK	M1(P1V)	1	4	4	2	0,12 %
4	SK	P1S	1	3	4	28	1,62 %
4	SK	R2(P1V)	1	4	4	1	0,06 %
4	SK	V3(P1V)	1	4	4	8	0,46 %
4	UK	5	1	3	2	429	5,15 %
4	UK	8	1	4	2	63	0,76 %
5	BE (W)	RIV_20	1	2	4	66	18,70 %
5	CZ	11214	1	2		6	0,56 %
5	CZ	21214	1	2		7	0,65 %
5	CZ	41214	1	2		7	0,65 %
5	DE	14	1	2	4	1302	14,35 %
5	DE	16	1	2	4	872	9,61 %
5	DE	18	1	2	2	298	3,28 %
5	EE	1A	1	2	4	128	19,84 %
5	EE	1B	1	2	2	385	59,69 %
5	FR	TP14	1	2	4	752	6,95 %
5	FR	TP15	1	2	2	184	1,70 %
5	FR	TP9	1	2	2	1329	12,28 %
5	HR	HR-R_2A	1	2	4	399	36,40 %
5	HR	HR-R_2B	1	2	4	196	17,90 %
5	HU	11R				7	0,81 %
5	HU	15R	1	2, 3	2	46	5,29 %
5	HU	16R	1	2, 3	2	29	3,34 %
5	HU	17R	1	2, 3	2	53	6,10 %
5	IE	21			4	155	3,39 %
5	IE	22			4	272	5,96 %
5	IE	23			4	87	1,91 %
5	IE	24			4	58	1,27 %
5	IE	31	1	2	2	1299	28,45 %
5	IE	32	1	2	2	670	14,67 %
5	IE	33			2	109	2,39 %
5	IE	34			2	58	1,27 %
5	IT	IT06AS2T	1	2	4	34	0,44 %
5	IT	IT06AS6T	1	1	4	129	1,69 %
5	IT	IT06SR6T	1	1	4	30	0,39 %
5	IT	IT06SS1T	1	2	4	74	0,97 %

Broad River types revised	MS	National typology	Altitude	Catchment	Geology	WBs	% within MS
5	LT	RWT1	1	2	2	589	70,79 %
5	LU	4	1	2		47	43,52 %
5	LV	R1	1	2	2	3	1,48 %
5	LV	R2	1	2	2	1	0,49 %
5	NL	R4	1	1	2	47	18,50 %
5	NL	R5	1	2	2	133	52,36 %
5	NL	R6	1	2	2	30	11,81 %
5	NO	9	1		2		
5	PL	16	1	2	2	295	6,43 %
5	RO	RO06	1	2, 3	4	156	4,78 %
5	SE	V3SNY	1	1, 2	2	15	0,10 %
5	SE	V4SNY	1	1, 2	2	46	0,30 %
5	SE	V5SNY	1	1, 2	2	42	0,27 %
5	SE	V6SNY	1	1, 2	2	3	0,02 %
5	SK	P1M	1	2	4	259	15,01 %
5	UK	2	1	2	2	3088	37,04 %
5	UK	40	1	1	2	342	4,10 %
6	FI	Kt	1	3	3	532	33,21 %
6	FI	Pt	1	2	3	281	17,54 %
6	NO	3	1		1, 3		
6	NO	6	1		1, 3		
6	NO	8	1		1, 3		
6	PL	23	1	2	3	314	6,85 %
6	SE	V3LYN	1	3, 4, 5	1, 3	946	6,08 %
6	SE	V3SYN	1	1, 2	1, 3	2287	14,70 %
6	SE	V4LYN	1	3, 4, 5	1, 3	218	1,40 %
6	SE	V4SYN	1	1, 2	1, 3	577	3,71 %
6	SE	V5LYN	1	3, 4, 5	1, 3	40	0,26 %
6	SE	V5SYN	1	1, 2	1, 3	67	0,43 %
6	SE	V6LYN	1	3, 4, 5	1, 3	292	1,88 %
6	SE	V6SYN	1	1, 2	1, 3	493	3,17 %
6	UK	3	1	2	3	136	1,63 %
6	UK	6	1	3	3	2	0,02 %
6	UK	9	1	4	3	7	0,08 %
6	UK	43	1	1	3	1	0,01 %
7	NO	10	1		2		
7	NO	11	1		3, 4		
7	SE	V3LYY	1	3, 4, 5	2, 3	3	0,02 %
7	SE	V3SYY	1	1, 2	2, 3	14	0,09 %
7	SE	V4LYY	1	3, 4, 5	2, 3	67	0,43 %
7	SE	V4SYY	1	1, 2	2, 3	168	1,08 %
7	SE	V5LYY	1	3, 4, 5	2, 3	20	0,13 %
7	SE	V5SYY	1	1, 2	2, 3	17	0,11 %
7	SE	V6LYY	1	3, 4, 5	2, 3	32	0,21 %

Broad River types revised	MS	National typology	Altitude	Catchment	Geology	WBs	% within MS
7	SE	V6SYY	1	1, 2	2, 3	32	0,21 %
8	AT	MZB_1_1,25				164	2,23 %
8	AT	MZB_12_1,75	2	3	1	243	3,31 %
8	AT	MZB_3_1,25				5	0,07 %
8	AT	MZB_4_1,25				12	0,16 %
8	BE (W)	RIV_06	2	3	1	11	3,10 %
8	BE (W)	RIV_07	2	3	1	4	1,10 %
8	BE (W)	RIV_08	2	4	1	1	0,30 %
8	BG	R5	2	3	1		
8	CZ	22124	2	3		1	0,09 %
8	CZ	22125	2	3		1	0,09 %
8	CZ	22137	2	4		1	0,09 %
8	CZ	32124	2	3		6	0,56 %
8	CZ	32125	2	3		10	0,94 %
8	CZ	32126	2	3		2	0,19 %
8	CZ	32136	2	4		3	0,28 %
8	CZ	32137	2	4		1	0,09 %
8	CZ	42124	2	3		100	9,35 %
8	CZ	42125	2	3		91	8,51 %
8	CZ	42126	2	3		28	2,62 %
8	CZ	42135	2	4		2	0,19 %
8	CZ	42136	2	4		23	2,15 %
8	CZ	42137	2	4		11	1,03 %
8	CZ	43124	2	3		11	1,03 %
8	CZ	43125	2	3		7	0,65 %
8	CZ	43126	2	3		2	0,19 %
8	CZ	43136	2	4		1	0,09 %
8	DE	9	2	3	1	240	2,64 %
8	FR	G17/3-21	2	4	1	6	0,06 %
8	FR	G21	2	4	1	9	0,08 %
8	FR	G3	2	4	1	10	0,09 %
8	FR	GM22	2	4	1	3	0,03 %
8	FR	GM8	2	4	1	23	0,21 %
8	FR	P21	2	3	1	120	1,11 %
8	FR	P3	2	3	1	183	1,69 %
8	IT	IT03SS3N	2	3	1	32	0,42 %
8	LU	3	2	3		11	10,19 %
8	PL	8	2	3	1	35	0,76 %
8	SE	V2LNN	2	3, 4, 5	1	1364	8,76 %
8	SE	V7LNN	2	3, 4, 5	1	3	0,02 %
8	UK	13	2	3	1	246	2,95 %
8	UK	16	2	4	1	25	0,30 %
9	AT	MZB_12_1,5	2	2	1	448	6,10 %
9	BE (W)	RIV_04	2	2	1	9	2,50 %

Broad River types revised	MS	National typology	Altitude	Catchment	Geology	WBs	% within MS
9	BE (W)	RIV_05	2	2	1	80	22,60 %
9	BG	R4	2	2	1		
9	CZ	12114	2	2		2	0,19 %
9	CZ	22114	2	2		9	0,84 %
9	CZ	22115	2	2		1	0,09 %
9	CZ	32113	2	2		2	0,19 %
9	CZ	32114	2	2		22	2,06 %
9	CZ	32115	2	2		1	0,09 %
9	CZ	42113	2	2		2	0,19 %
9	CZ	42114	2	2		298	27,88 %
9	CZ	42115	2	2		9	0,84 %
9	CZ	43114	2	2		81	7,58 %
9	CZ	43115	2	2		8	0,75 %
9	DE	5	2	2	1	1322	14,57 %
9	DE	5.1	2	2	1	294	3,24 %
9	FR	TP21	2	2	1	357	3,30 %
9	FR	TP4	2	2	1	133	1,23 %
9	HU	1R	2			28	3,22 %
9	IT	IT03GH6N	2	1	1	56	0,73 %
9	IT	IT03SR6N	2	1	1	97	1,27 %
9	IT	IT03SS1N	2	2	1	256	3,35 %
9	IT	IT03SS2N	2	2	1	162	2,12 %
9	LU	1	2	2		28	25,93 %
9	LU	2	2	2		8	7,41 %
9	NO	12	2		1		
9	NO	13	2		1		
9	NO	15	2		1		
9	NO	16	2		1		
9	NO	18	2		1		
9	PL	4	2	2	1	117	2,55 %
9	PL	5	2	2	1	33	0,72 %
9	PL	12	2	2	1	274	5,97 %
9	SE	V2SNN	2	1, 2	1	3047	19,58 %
9	SE	V7SNN	2	1, 2	1	17	0,11 %
9	UK	10	2	2	1	1426	17,10 %
10	AT	MZB_11_1,75	2	3	4	465	6,34 %
10	AT	MZB_13_1,5	2	3	4	198	2,70 %
10	AT	MZB_15_1,75				38	0,52 %
10	AT	MZB_5_1,75				101	1,38 %
10	AT	MZB_7_1,5				33	0,45 %
10	AT	MZB_8_1,5				8	0,11 %
10	AT	MZB_9_1,75				9	0,12 %
10	BE (W)	RIV_03	2	3	2	4	1,10 %
10	BE (W)	RIV_11	2	3	2	3	0,90 %

Broad River types revised	MS	National typology	Altitude	Catchment	Geology	WBs	% within MS
10	BE (W)	RIV_12	2	4	2	2	0,60 %
10	BE (W)	RIV_15	2	3	2	9	2,50 %
10	BE (W)	RIV_16	2	3	2	1	0,30 %
10	BE (W)	RIV_17	2	4	2	2	0,60 %
10	BE (W)	RIV_18	2	4	2	3	0,90 %
10	CZ	12225	2	3		1	0,09 %
10	CZ	22225	2	3		11	1,03 %
10	CZ	22226	2	3		4	0,37 %
10	CZ	22237	2	4		1	0,09 %
10	CZ	32224	2	3		1	0,09 %
10	CZ	32225	2	3		2	0,19 %
10	CZ	42224	2	3		8	0,75 %
10	CZ	42225	2	3		9	0,84 %
10	CZ	42226	2	3		4	0,37 %
10	CZ	42236	2	4		5	0,47 %
10	DE	3.2	2	3	2	3	0,03 %
10	DE	4	2	4	2	29	0,32 %
10	DE	9.1	2	3	2	104	1,15 %
10	DE	9.2	2	4	2	99	1,09 %
10	DE	9.1_K	2	3	2	23	0,25 %
10	FI	Sk-Po	2	4	4	9	0,56 %
10	FR	G10	2	4	2	9	0,08 %
10	FR	G10/4	2	4	4	10	0,09 %
10	FR	G3/19-8	2	4	2	5	0,05 %
10	FR	G5	2	4	2	7	0,06 %
10	FR	GM19/8	2	4	4	7	0,06 %
10	FR	GM5/2	2	4	4	4	0,04 %
10	HR	HR-R_10B	2	3	2	2	0,20 %
10	HR	HR-R_7	2	3, 4	4	12	1,10 %
10	HR	HR-R_9	2	3	2	8	0,70 %
10	HU	10R	1, 2	4	2	4	0,46 %
10	HU	5R	1, 2	3	2	40	4,60 %
10	HU	6R	1, 2	4	2	9	1,04 %
10	HU	9R	1, 2	3	2	94	10,82 %
10	PL	9	2	3	2	46	1,00 %
10	RO	RO02	2, 3	4	4	11	0,34 %
10	RO	RO05	2	4	4	47	1,44 %
10	SE	V2LNY	2	3, 4, 5	2	104	0,67 %
10	SK	H1(K2V)	2	4	4	2	0,12 %
10	SK	H2(K2V)	2	4	4	1	0,06 %
10	SK	K2S	2	3	4	48	2,78 %
10	SK	K3S	2	3	4	11	0,64 %
10	SK	P1(K3V)	2	4	4	1	0,06 %
10	SK	P2(K3V)	2	4	4	1	0,06 %

Broad River types revised	MS	National typology	Altitude	Catchment	Geology	WBs	% within MS
10	SK	P2S	2	3	4	4	0,23 %
10	SK	R1(K2V)	2	4	4	1	0,06 %
10	SK	S(K2V)	2	4	4	2	0,12 %
10	SK	V1(K3V)	2	4	4	3	0,17 %
10	SK	V2(K2V)	2	4	4	2	0,12 %
10	UK	14	2	3	2	91	1,09 %
10	UK	17	2	4	2	21	0,25 %
11	AT	MZB_10_1,75				20	0,27 %
11	AT	MZB_11_1,5	2	1	4	221	3,01 %
11	AT	MZB_13_1,75	2	2	4	547	7,45 %
11	AT	MZB_15_1,5	2	2	4	224	3,05 %
11	AT	MZB_5_1,5	2	2	2	442	6,02 %
11	BE (W)	RIV_01	2	2	2	6	1,60 %
11	BE (W)	RIV_02	2	2	2	9	2,50 %
11	BE (W)	RIV_09	2	2	2	15	4,20 %
11	BE (W)	RIV_10	2	2	2	13	3,70 %
11	BE (W)	RIV_13	2	2	2	15	4,30 %
11	BE (W)	RIV_14	2	2	2	46	13,00 %
11	CZ	22214	2	2		70	6,55 %
11	CZ	22215	2	2		7	0,65 %
11	CZ	23214	2	2		11	1,03 %
11	CZ	23215	2	2		1	0,09 %
11	CZ	32214	2	2		4	0,37 %
11	CZ	42214	2	2		40	3,74 %
11	CZ	42215	2	2		2	0,19 %
11	CZ	43213	2	2		1	0,09 %
11	CZ	43214	2	2		4	0,37 %
11	DE	3.1	2	2	2	53	0,58 %
11	DE	6	2	2	2	431	4,75 %
11	DE	7	2	2	2	304	3,35 %
11	DE	6_K	2	2	2	75	0,83 %
11	FR	TP10	2	2	2	599	5,53 %
11	FR	TP11	2	2	2	130	1,20 %
11	HR	HR-R_1	2	2	4	69	6,30 %
11	HR	HR-R_10A	2	2	2	62	5,70 %
11	HR	HR-R_6	2	2	4	36	3,30 %
11	HU	4R	2	2, 3	2	71	8,17 %
11	HU	8R	1, 2	2, 3	2	138	15,88 %
11	IT	IT02SR6N	2	1	2	55	0,72 %
11	IT	IT02SR6T	2	1	2	93	1,22 %
11	IT	IT02SS1N	2	2	2	48	0,63 %
11	IT	IT02SS1T	2	2	2	229	3,00 %
11	IT	IT02SS2N	2	2	2	34	0,44 %
11	IT	IT02SS2T	2	2	2	115	1,50 %

Broad River types revised	MS	National typology	Altitude	Catchment	Geology	WBs	% within MS
11	IT	IT06SS2T	2	2	4	172	2,25 %
11	IT	IT10SS1N	2	2	2	93	1,22 %
11	IT	IT10SS2N	2	2	2	182	2,38 %
11	PL	6	2	2	2	323	7,04 %
11	PL	7	2	2	2	53	1,16 %
11	RO	RO01	2, 3	2, 3	4	900	27,59 %
11	RO	RO04	2	2, 3	4	359	11,01 %
11	SE	V2SNY	2	1, 2	2	77	0,49 %
11	SK	K2M	2	2	2	592	34,30 %
11	SK	P2M	2	2	4	60	3,48 %
11	UK	11	2	2	2	612	7,34 %
12	BE (W)	RIV_24	2	2	3	8	2,30 %
12	NO	14	2		1, 3		
12	NO	17	2		1, 3		
12	NO	19	2		1, 3		
12	SE	V2LYN	2	3, 4, 5	1, 3	738	4,74 %
12	SE	V2SYN	2	1, 2	1, 3	2363	15,18 %
12	SE	V7LYN	2	3, 4, 5	1, 3	36	0,23 %
12	SE	V7SYN	2	1, 2	1, 3	145	0,93 %
13	FI	St-Po	2	4	3	1	0,06 %
13	PL	24	2	4	3	98	2,14 %
13	SE	V2LYY	2	3, 4, 5	2, 3	28	0,18 %
13	SE	V2SYY	2	1, 2	2, 3	20	0,13 %
13	SE	V7LYY	2	3, 4, 5	2, 3	2	0,01 %
13	SE	V7SYY	2	1, 2	2, 3	5	0,03 %
14	BG	R2	3	2	1		
14	BG	R3	3	2	1		
14	CZ	44114	3	2		7	0,65 %
14	CZ	44115	3	2		2	0,19 %
14	FR	TP3	3	2	1	577	5,33 %
14	IT	IT03GH1N	3	2	1	29	0,38 %
14	NO	20	3		1		
14	NO	21	3		1		
14	NO	22	3		1, 3		
14	NO	23	3		1		
14	NO	24	3		1		
14	NO	25	3		1, 3		
14	PL	1	3	2	1	4	0,09 %
14	SE	V1LNN	3	3, 4, 5	1	123	0,79 %
14	SE	V1SNN	3	1, 2	1	778	5,00 %
14	UK	18	3	2	1	5	0,06 %
15	AT	MZB_5_1,25	3	1	2	267	3,64 %
15	AT	MZB_6_1				112	1,53 %
15	AT	MZB_6_1,25				183	2,49 %

Broad River types revised	MS	National typology	Altitude	Catchment	Geology	WBs	% within MS
15	AT	MZB_7_1				71	0,97 %
15	AT	MZB_7_1,25	3	2	2	198	2,70 %
15	AT	MZB_8_1,25				32	0,44 %
15	BG	R1	3	2	4		
15	CY	R2				17	7,87 %
15	DE	1.1	3	2	2	40	0,44 %
15	DE	1.2	3	3	2	31	0,34 %
15	FR	TP5	3	2	2	361	3,34 %
15	FR	TP7	3	2	2	215	1,99 %
15	PL	2	3	2	2	2	0,04 %
15	SE	V1LNY	3	3, 4, 5	2	4	0,03 %
15	SE	V1SNY	3	1, 2	2	7	0,04 %
15	SK	K3M	3	2	4	492	28,51 %
15	SK	K4M	3	2	4	195	11,30 %
16	AT	MZB_2_1,25	3	3	1	603	8,22 %
16	AT	MZB_2_1,5	2	3	1	929	12,66 %
16	AT	MZB_3_1,5	3	3	1	716	9,76 %
16	FR	G1	2	4	4	3	0,03 %
16	FR	G14/1	2	4	4	16	0,15 %
16	FR	G2	2	4	4	10	0,09 %
16	FR	GM7/2	2	4	4	5	0,05 %
16	FR	M1	3	3	4	19	0,20 %
16	FR	P1				88	0,80 %
16	FR	TP1	3	2	4	255	2,36 %
16	FR	TP2	3	2	1	277	2,56 %
16	IT	IT01GH1N	3	2	1	45	0,59 %
16	IT	IT01GH2N	2	2	1	45	0,59 %
16	IT	IT01SS1N	2	2	1	105	1,37 %
16	IT	IT01SS2N	2	2	1	77	1,01 %
16	IT	IT04SS2N	2	2	1	58	0,76 %
17	EL	LOW-L-C	1	4	2	93	9,00 %
17	EL	LOW-L-S	1	4	1	135	13,07 %
17	EL	LOW-M-C	1	3	2	98	9,49 %
17	EL	LOW-M-S	1	3	1	107	10,36 %
17	FR	G16	1	4	1	4	0,04 %
17	FR	G6	1	4	2	6	0,06 %
17	FR	GM6/1	1	4	4	6	0,06 %
17	HR	HR-R_13	1	3, 4	2	4	0,40 %
17	HR	HR-R_13A	1	4	2	2	0,20 %
17	HR	HR-R_18	1	3	4	5	0,50 %
17	IT	IT06SS3T	1	3	4	48	0,63 %
17	IT	IT06SS4D	1	3	4	46	0,60 %
17	IT	IT06SS4F	1	3	4	28	0,37 %
17	PT	R_L	1	2, 3, 4	4	92	5,71 %

Broad River types revised	MS	National typology	Altitude	Catchment	Geology	WBs	% within MS
17	PT	R_S1G	1	3, 4	1	92	5,71 %
17	PT	R_S3	1	2, 3, 4	1, 2	175	10,86 %
18	EL	MID-L-C	2	4	2	84	8,13 %
18	EL	MID-L-S	2	4	1	114	11,04 %
18	EL	MID-M-C	2	3	2	72	6,97 %
18	EL	MID-M-S	2	3	1	95	9,20 %
18	FR	GM6/2-7	2	4	4	16	0,15 %
18	FR	GM6/8	2	4	4	21	0,19 %
18	FR	GMP7	2	4	2	32	0,30 %
18	FR	TG6/1-8	2	4	4	2	0,02 %
18	HR	HR-R_12	2	3, 4	2	8	0,70 %
18	IT	IT10SS3N	2	3	2	71	0,93 %
18	IT	IT13AS3N	2	3	2	34	0,44 %
18	IT	IT19SS3N	2	3	1	34	0,44 %
18	IT	IT21SS3T	2	3	1	32	0,42 %
19	EL	LOW-S-C	1	2	2	53	5,13 %
19	FR	PTP16-A	2	2	1	166	1,53 %
19	FR	PTP8	2	2	1	164	1,52 %
19	FR	TP6	1	2	4	510	4,71 %
19	HR	HR-R_11	1, 2	2	4	10	0,90 %
19	HR	HR-R_16B	1	2	4	62	5,70 %
19	HR	HR-R_17	1, 2	2	4	15	1,40 %
19	HR	HR-R_19	1	2, 3	4	20	1,80 %
19	IT	IT09SS2T	2	2	2	37	0,48 %
19	IT	IT10SS2T	2	2	2	61	0,80 %
19	IT	IT11SS2N	2	2	4	51	0,67 %
19	IT	IT11SS2T	2	2	4	28	0,37 %
19	IT	IT13SR2T	2	2	2	47	0,61 %
19	IT	IT14SS2T	1	2	1	29	0,38 %
19	IT	IT19SR1N	2	2	1	30	0,39 %
19	IT	IT19SR2N	2	2	1	34	0,44 %
19	IT	IT19SS1N	2	2	1	39	0,51 %
19	IT	IT19SS2N	2	2	1	48	0,63 %
19	IT	IT21SS2T	2	2	1	32	0,42 %
19	PT	R_N1P	2	2	1	397	24,64 %
19	PT	R_N3	2	2	1	109	6,77 %
20	BG	R14	2	3	4		
20	CY	R1			4	40	18,52 %
20	CY	R3			4	159	73,61 %
20	IT	IT02IN7N				34	0,44 %
20	IT	IT02IN7T				88	1,15 %
20	IT	IT06IN7D				66	0,86 %
20	IT	IT06IN7N				84	1,10 %
20	IT	IT10EF7N				63	0,82 %

Broad River types revised	MS	National typology	Altitude	Catchment	Geology	WBs	% within MS
20	IT	IT10IN7N				139	1,82 %
20	IT	IT11EF7N				181	2,37 %
20	IT	IT11IN7N				172	2,25 %
20	IT	IT11IN7T				40	0,52 %
20	IT	IT12IN7N				36	0,47 %
20	IT	IT19EF7N				50	0,65 %
20	IT	IT19IN7N				94	1,23 %
20	IT	IT19IN8N				34	0,44 %
20	IT	IT20IN7N				153	2,00 %
20	IT	IT21EF7T				453	5,93 %
20	IT	IT21IN7T				151	1,98 %
20	PT	R_S1P	1	2	1	422	26,19 %
20	PT	R_S4	1	2, 3	2	33	2,05 %
20	RO	RO17	3	2, 3	1	10	0,31 %
20	RO	RO18	3	2	4	137	4,20 %
20	RO	RO19	2	2	4	574	17,60 %
20	RO	RO20	1	3	4	335	10,27 %
20	SI	JDP	2		2	1	

B) Lakes: Links between the broad types and 290 national types

MS = Member State (or Norway), WBs = Water bodies, Broad lake type codes are described in table 3.13, and codes for Altitude, Catchment size and Geology are described in table 3.10, chapter 3.

Broad Lake types revised	MS	National typology	Altitude	Area	Geology	Mean depth	WBs	% within MS
1	AT	B1	2	5	4	3	1	1.6 %
1	BG	L11		5		3		
1	FI	Sh	1	5	3	2	44	1.0 %
1	FI	SVh	1	5	1	2	68	1.6 %
1	FR	A52	1	5		3	1	0.2 %
1	IT	ITAL-3	2	5	2	3	12	4.0 %
2	CZ	311322	1	4	1	2	1	1.4 %
2	EE	5	1	3	2	1	1	1.1 %
2	FI	Vh	1	4	1	2	618	14.5 %
2	IE	1		1			14	5.9 %
2	IE	2	1	2	1	1	23	9.7 %
2	IE	3		1			9	3.8 %
2	IE	4	1	2	1	2	42	17.6 %
2	NO	1	1		1	2		
2	NO	2	1		1	2		
2	NO	4	1		1	2		
2	NO	5	1		1	2		
2	NO	6	1		1	3		
2	NO	8	1		1, 4	2		
2	SE	S3DLNN	1	4, 5	1	2, 3	34	0.5 %
2	SE	S3DSNN	1	1, 2, 3	1	2, 3	282	3.9 %
2	SE	S3SLNN	1	4, 5	1	1	3	0.0 %
2	SE	S3SSNN	1	1, 2, 3	1	1	195	2.7 %
2	SE	S4DLNN	1	4, 5	1	2, 3	22	0.3 %
2	SE	S4DSNN	1	1, 2, 3	1	2, 3	132	1.8 %
2	SE	S4SSNN	1	1, 2, 3	1	1	41	0.6 %
2	SE	S5DLNN	1	4, 5	1	2, 3	1	0.0 %
2	SE	S5DSNN	1	1, 2, 3	1	2, 3	7	0.1 %
2	SE	S5SSNN	1	1, 2, 3	1	1	5	0.1 %
2	SE	S6DLNN	1	4, 5	1	2, 3	32	0.4 %
2	SE	S6DSNN	1	1, 2, 3	1	2, 3	131	1.8 %
2	SE	S6SLNN	1	4, 5	1	1	2	0.0 %
2	SE	S6SSNN	1	1, 2, 3	1	1	15	0.2 %
2	UK	11	1		1		4	0.4 %
2	UK	LAD			1	3	18	1.6 %
2	UK	LAS		3	1	2	179	16.0 %
2	UK	Lowland Low alkalinity Large Deep	1	4	1	3	76	6.8 %
2	UK	Lowland Medium alkalinity Large Deep	1	4	4	3	82	7.3 %

Broad Lake types revised	MS	National typology	Altitude	Area	Geology	Mean depth	WBs	% within MS
2	UK	MAD			4	3	5	0.4 %
2	UK	MAS			4	2	85	7.6 %
3	BE (Fl)	Awe	1	2, 3	2		7	38.9 %
3	BE (Fl)	Awom	1	2, 3	2		1	5.6 %
3	BG	L14	1	4	4	2		
3	BG	L15	1	4	4	2		
3	BG	L16	1	3	4	2		
3	BG	L17	1	3	4	2		
3	DE	10	1	4	2	2	155	21.8 %
3	DE	13	1	2	2	2	93	13.1 %
3	EE	1	1	1	2	3	1	1.1 %
3	EE	3	1	1, 2, 3	2	2	22	24.7 %
3	EE	6	1	5	4	2	1	1.1 %
3	EE	7	1	5	4	2	2	2.2 %
3	FR	A16	1	3	2	2	25	5.7 %
3	FR	A6b	1	3	4	2	54	12.3 %
3	HU	13L	1	3	2	2	30	14.1 %
3	HU	15L	1	4	2	2	6	2.8 %
3	IE	7		1			13	5.5 %
3	IE	8	1	2	2	2	22	9.2 %
3	IE	11		1			3	1.3 %
3	IE	12	1	2	2	2	24	10.1 %
3	IT	ITAL-5	2	3	4	2	26	8.7 %
3	LT	LWT2	1		2	2	172	49.9 %
3	LT	LWT3	1		2	2	43	12.4 %
3	LV	L5	1	2,3	2	2	159	61.4 %
3	LV	L7	1	2,3	2	2	2	0.8 %
3	NL	M20	1	3	2	2	29	6.4 %
3	NL	M21	1	5	4	2	2	0.4 %
3	NO	10	1		2	1, 2		
3	PL	2a	1	3	2	2	111	10.6 %
3	PL	3a	1	3	2	2	254	24.3 %
3	PL	6a	1	3	2	2	133	12.7 %
3	RO	ROLN14T	1	3	4	2	5	3.8 %
3	SE	S3DSNY	1	1, 2, 3	2	2, 3	4	0.1 %
3	SE	S4DLNY	1	4, 5	2	2, 3	4	0.1 %
3	SE	S4DSNY	1	1, 2, 3	2	2, 3	39	0.5 %
3	SE	S5DLNY	1	4, 5	2	2, 3	3	0.0 %
3	SE	S5DSNY	1	1, 2, 3	2	2, 3	3	0.0 %
3	SE	S6SSYN	1	1, 2, 3	1, 3	1	77	1.1 %
3	UK	HAS		3	2	2	166	14.8 %
3	UK	Lowland High alkalinity Large Deep	1	4	2	3	20	1.8 %
3	UK	MarlS				2	10	0.9 %

Broad Lake types revised	MS	National typology	Altitude	Area	Geology	Mean depth	WBs	% within MS
4	AT	A1	1	5		1	1	1.6 %
4	BE (Fl)	Ai	1	2	2		1	5.6 %
4	BE (Fl)	Ami	1	2	2		5	27.8 %
4	BG	L4	1	1	4	1		
4	CZ	311211	1	3	1	1	1	1.4 %
4	CZ	311212	1	3	1	1	1	1.4 %
4	CZ	411112	1	2	1	1	1	1.4 %
4	EE	2	1	3	2	1	33	37.0 %
4	HU	16L	1	5	2	1	1	0.5 %
4	IE	5	1	1	2	1	16	6.7 %
4	IE	6	1	2	2	1	32	13.4 %
4	IE	9		1			11	4.6 %
4	IE	10	1	2	2	1	27	11.3 %
4	IT	ITAL-4					12	4.0 %
4	LT	LWT1	1		2	1	130	37.7 %
4	LV	L1	1	2,3	2	1	37	14.3 %
4	LV	L2	1	2,3	2	1	23	8.9 %
4	NL	M14	1	3	2	1	51	11.3 %
4	PL	3b	1	2	2	1	296	28.4 %
4	RO	ROLN01	1	2	1	1	18	13.7 %
4	RO	ROLN02	1	3	1	1	18	13.7 %
4	RO	ROLN05	1	4	2	1	6	4.6 %
4	RO	ROLN06	1	5	2	1	1	0.8 %
4	SE	S3SSNY	1	1, 2, 3	2	1	3	0.0 %
4	SE	S3SSYY	1	1, 2, 3	2, 3	1	4	0.1 %
4	SE	S4SLNN	1	4, 5	1	1	2	0.0 %
4	SE	S4SLNY	1	4, 5	2	1	1	0.0 %
4	SE	S4SLYY	1	4, 5	2, 3	1	1	0.0 %
4	SE	S4SSNY	1	1, 2, 3	2	1	18	0.2 %
4	SE	S4SSYY	1	1, 2, 3	2, 3	1	24	0.3 %
4	SE	S5SLNY	1	4, 5	2	1	1	0.0 %
4	SE	S5SSNY	1	1, 2, 3	2	1	7	0.1 %
4	SE	S5SSYY	1	1, 2, 3	2, 3	1	1	0.0 %
4	SE	S6SLYY	1	4, 5	2, 3	1	1	0.0 %
4	SE	S6SSYY	1	1, 2, 3	2, 3	1	4	0.1 %
4	UK	5	1		2		14	1.3 %
4	UK	HAVS		2	2	1	212	18.9 %
4	UK	Lowland High alkalinity Large Shallow	1	4	2	1	19	1.7 %
4	UK	MarlVS				1	11	1.0 %
5	FI	Ph	1	3	3	2	578	13.5 %
5	LV	L4	1	2,3	3	1	7	2.7 %
5	LV	L8	1	2,3	1	2	4	1.5 %
5	NO	3	1		1, 3	2		

Broad Lake types revised	MS	National typology	Altitude	Area	Geology	Mean depth	WBs	% within MS
5	NO	7	1		1, 3	2		
5	NO	9	1		1, 3	2		
5	SE	S3DLYN	1	4, 5	1, 3	2, 3	32	0.4 %
5	SE	S3DSYN	1	1, 2, 3	1, 3	2, 3	442	6.1 %
5	SE	S3SLYN	1	4, 5	1, 3	1	3	0.0 %
5	SE	S3SSYN	1	1, 2, 3	1, 3	1	679	9.4 %
5	SE	S4DLYN	1	4, 5	1, 3	2, 3	31	0.4 %
5	SE	S4DSYN	1	1, 2, 3	1, 3	2, 3	168	2.3 %
5	SE	S4SSYN	1	1, 2, 3	1, 3	1	136	1.9 %
5	SE	S5DLYN	1	4, 5	1, 3	2, 3	1	0.0 %
5	SE	S5DSYN	1	1, 2, 3	1, 3	2, 3	5	0.1 %
5	SE	S5SLYN	1	4, 5	1, 3	1	2	0.0 %
5	SE	S5SSYN	1	1, 2, 3	1, 3	1	7	0.1 %
5	SE	S6DLYN	1	4, 5	1, 3	2, 3	10	0.1 %
5	SE	S6DSYN	1	1, 2, 3	1, 3	2, 3	150	2.1 %
5	SE	S6SLYN	1	4, 5	1, 3	1	3	0.0 %
5	UK	12	1		3		2	0.2 %
5	UK	Lowland Peat Large Deep	1	4	3	3	11	1.0 %
5	UK	Lowland Peat Large Shallow	1	4	3	1	4	0.4 %
6	EE	4	1	1, 2, 3	4	1	6	6.7 %
6	HU	1L	1		3		1	0.5 %
6	HU	2L	1		3	2	5	2.3 %
6	HU	3L	1	2	3	1	2	0.9 %
6	LV	L6	1	2,3	2	2	13	5.0 %
6	NL	M27	1	3	3	2	25	5.6 %
6	NO	11	1		2, 3	1, 2		
6	RO	ROLN07	1	2	3	1	10	7.6 %
6	RO	ROLN08	1	3	3	1	34	26.0 %
6	RO	ROLN09	1	4	3	1	8	6.1 %
6	SE	S4DLYY	1	4, 5	2, 3	2, 3	4	0.1 %
6	SE	S4DSYY	1	1, 2, 3	2, 3	2, 3	15	0.2 %
6	SE	S6DSYY	1	1, 2, 3	2, 3	2, 3	7	0.1 %
7	AT	D3					2	3.2 %
7	CZ	221122	2	2	1	2	1	1.4 %
7	CZ	221223	2	3	1	2	1	1.4 %
7	CZ	321222	2	3	1	2	1	1.4 %
7	CZ	421112	2	2	1	1	5	7.0 %
7	CZ	421121	2	2	1	2	1	1.4 %
7	CZ	421122	2	2	1	2	6	8.5 %
7	CZ	421123	2	2	1	2	1	1.4 %
7	CZ	421132	2	2	1	3	1	1.4 %
7	CZ	421133	2	2	1	3	1	1.4 %

Broad Lake types revised	MS	National typology	Altitude	Area	Geology	Mean depth	WBs	% within MS
7	CZ	421211	2	3	1	1	2	2.8 %
7	CZ	421212	2	3	1	1	7	9.9 %
7	CZ	421221	2	3	1	2	1	1.4 %
7	CZ	421222	2	3	1	2	6	8.5 %
7	CZ	421231	2	3	1	3	1	1.4 %
7	CZ	421232	2	3	1	3	3	4.2 %
7	CZ	421332	2	4	1	3	5	7.0 %
7	CZ	421333	2	4	1	3	1	1.4 %
7	CZ	431111	2	2	1	1	1	1.4 %
7	CZ	431122	2	2	1	2	6	8.5 %
7	CZ	431222	2	3	1	2	3	4.2 %
7	CZ	431223	2	3	1	2	1	1.4 %
7	CZ	431232	2	3	1	3	4	5.6 %
7	CZ	431233	2	3	1	3	2	2.8 %
7	CZ	431322	2	4	1	2	1	1.4 %
7	DE	8		4		3	17	2.4 %
7	FR	A4	2	2	1	2	14	3.2 %
7	IE	13					2	0.8 %
7	IT	ITAL-8	2		1		4	1.3 %
7	NO	12	2		1	2		
7	NO	13	2		1	2		
7	NO	15	2		1	2		
7	NO	16	2		1	2		
7	NO	18	2		1, 4	2		
7	SE	S2DLNN	2	4, 5	1	2, 3	159	2.2 %
7	SE	S2DSNN	2	1, 2, 3	1	2, 3	1658	22.9 %
7	SE	S2SLNN	2	4, 5	1	1	3	0.0 %
7	SE	S2SSNN	2	1, 2, 3	1	1	615	8.5 %
7	SE	S7DLNN	2	4, 5	1	2, 3	4	0.1 %
7	SE	S7DSNN	2	1, 2, 3	1	2, 3	38	0.5 %
7	SE	S7SSNN	2	1, 2, 3	1	1	3	0.0 %
7	UK	Mid-altitude Low alkalinity Large Deep	2	4	1	3	61	5.5 %
7	UK	Mid-altitude Medium alkalinity Large Deep	2	4	4	3	31	2.8 %
8	AT	B2	2	3	4	2	5	8.1 %
8	AT	C1a	2		2	3	3	4.8 %
8	AT	C1b	2	3	4	2	4	6.5 %
8	AT	D1	2	4	2	3	6	9.7 %
8	AT	D2a	2	2	2	3	3	4.8 %
8	AT	D2b	2	2	2	2	3	4.8 %
8	BG	L12	2	3	4	3		
8	BG	L13	2	3	4	3		
8	CZ	222122	2	2	2	2	1	1.4 %
8	CZ	222222	2	3	2	2	1	1.4 %
8	CZ	232122	2	2	2	2	1	1.4 %
8	CZ	232232	2	3	2	3	1	1.4 %
8	CZ	422223	2	3	2	2	1	1.4 %
8	DE	6		4		2	17	2.4 %
8	FR	A13a	2	3	4	1	30	6.8 %
8	FR	A5	2	3	4	2	73	16.6 %
8	FR	A7a	2	3	2	1	20	4.6 %
8	FR	A7b	2	3	4	2	15	3.4 %

Broad Lake types revised	MS	National typology	Altitude	Area	Geology	Mean depth	WBs	% within MS
8	FR	N4	2	4	2	3	20	4.6 %
8	HR	HR-J_1A	2	2	2	3	1	
8	HR	HR-J_1B	2	2	2	2	1	
8	SE	S2DLNY	2	4, 5	2	2, 3	1	0.0 %
8	SE	S2DSNY	2	1, 2, 3	2	2, 3	33	0.5 %
8	SE	S2SSNY	2	1, 2, 3	2	1	35	0.5 %
8	SI	A1	2	3	2	3	1	7.1 %
8	SI	A2	2	3	2	3	1	7.1 %
8	UK	Mid-altitude High alkalinity Large Deep	2	4	2	3	4	0.4 %
9	NO	14	2		1, 3	2		
9	NO	17	2		1, 3	2		
9	NO	19	2		1, 3	2		
9	SE	S2DLYN	2	4, 5	1, 3	2, 3	30	0.4 %
9	SE	S2DSYN	2	1, 2, 3	1, 3	2, 3	703	9.7 %
9	SE	S2SSYN	2	1, 2, 3	1, 3	1	572	7.9 %
9	SE	S7DLYN	2	4, 5	1, 3	2, 3	2	0.0 %
9	SE	S7DSYN	2	1, 2, 3	1, 3	2, 3	48	0.7 %
9	SE	S7SSYN	2	1, 2, 3	1, 3	1	24	0.3 %
9	UK	18	2		3		1	0.1 %
9	UK	Mid-altitude Peat Large Deep	2	4	3	3	1	0.1 %
10	SE	S2DSYY	2	1, 2, 3	2, 3	2, 3	13	0.2 %
10	SE	S2SSYY	2	1, 2, 3	2, 3	1	8	0.1 %
10	SE	S7DSYY	2	1, 2, 3	2, 3	2, 3	2	0.0 %
10	UK	23	2		2,3		1	0.1 %
11	BG	L1	3	1	4	2-3		
11	BG	L2	3	1	1, 4	2		
11	BG	L3	3	1	1, 4	2		
11	FR	A1	3	3	1	3	20	4.6 %
11	IT	ITAL-10	3	3	1	3	29	9.7 %
11	IT	ITAL-2	3	2	1	3	19	6.3 %
11	NO	20	3		1	2		
11	NO	21	3		1	2		
11	NO	22	3		1, 3	2		
11	NO	23	3		1	2		
11	NO	24	3		1	2		
11	NO	25	3		1, 3	2		
11	SE	S1DLNN	3	4, 5	1	2, 3	14	0.2 %
11	SE	S1DSNN	3	1, 2, 3	1	2, 3	405	5.6 %
11	SE	S1SSNN	3	1, 2, 3	1	1	52	0.7 %
12	AT	E1	3	3	2	3	10	16.1 %
12	AT	E2					1	1.6 %
12	EL	HIGH-D-L-C	3	4	2	3	1	3.4 %
12	EL	HIGH-D-S-C	3	3	2	3	1	3.4 %
12	EL	HIGH-D-XL-C	3	5	2	3	1	3.4 %
12	IT	ITAL-1					4	1.3 %
12	IT	ITAL-7	2		2		9	3.0 %
12	IT	ITAL-9	2		2		8	2.7 %
12	SE	S1DSNY	3	1, 2, 3	2	2, 3	12	0.2 %
12	SE	S1SSNY	3	1, 2, 3	2	1	1	0.0 %
13	EL	LOW-D-L-S	1	4	1	3	3	10.3 %
13	EL	LOW-S-L-S	1	4	1	1	4	13.8 %
13	EL	LOW-S-M-S	1	4	1	1	1	3.4 %
13	EL	LOW-S-S-S	1	2	1	1	1	3.4 %

Broad Lake types revised	MS	National typology	Altitude	Area	Geology	Mean depth	WBs	% within MS
13	EL	MID-D-L-S	2	4	1	3	1	3.4 %
13	IT	ITME-3					8	2.7 %
13	IT	ITME-5					4	1.3 %
13	PT	B-L-M/MI/S/PP	2, 3	2, 3	1	1	13	10.7 %
13	PT	B-L-M/MI-MP/S/P	2, 3	3, 4, 5	1	2	11	9.0 %
13	PT	L_N	1	2, 3, 4	1		37	30.3 %
13	PT	L_S	1	2, 3, 4	1		46	37.7 %
14	CY	L4					11	61.1 %
14	EL	LOW-D-L-C	1	4	2	3	1	3.4 %
14	EL	LOW-D-M-C	1	4	2	3	1	3.4 %
14	EL	LOW-S-L-C	1	4	2	1	3	10.3 %
14	FR	A3	2	3	2	3	14	3.2 %
14	HR	HR-J_2	1	3	2	3	1	
14	HR	HR-J_3	1	2	2	2	1	
14	HR	HR-J_4	1	4	2	1	1	
14	HR	HR-J_5	1	3	2	2	1	
14	IT	ITME-1	2	4	4	1	21	7.0 %
14	IT	ITME-2			2		38	12.7 %
14	IT	ITME-4	2	3	2	3	27	9.0 %
14	IT	ITME-6					1	0.3 %

Annex 3 List of national WFD types linked to broad types, sorted by country

The national WFD types listed below are those that match one of the broad types, according to information provided by the countries and dialogue between the ETC-ICM and the countries. Denmark and Spain are excluded based on requests by Danish and Spanish WFD authorities (section 3.2.3).

A) Rivers: Links between the broad types and 575 national types

MS = Member State (or Norway), WBs = Water bodies, Broad river type codes are described in table 3.11, nd codes for Altitude, Catchment size and Geology are described in table 3.10, chapter 3.

Broad River types revised	MS	National typology	Altitude	Catchment	Geology	WBs	% within MS
1	AT	MZB_16_1,75				46	0.6 %
1	AT	MZB_16_2				30	0.4 %
1	AT	MZB_17_1,5				11	0.1 %
1	AT	MZB_17_1,75	2	5	4	190	2.6 %
1	AT	MZB_17_1,75				190	2.6 %
1	AT	MZB_18_2				5	0.1 %
4	AT	MZB_13_2				25	0.3 %
8	AT	MZB_1_1,25				164	2.2 %
8	AT	MZB_12_1,75	2	3	1	243	3.3 %
8	AT	MZB_3_1,25				5	0.1 %
8	AT	MZB_4_1,25				12	0.2 %
9	AT	MZB_12_1,5	2	2	1	448	6.1 %
10	AT	MZB_11_1,75	2	3	4	465	6.3 %
10	AT	MZB_13_1,5	2	3	4	198	2.7 %
10	AT	MZB_15_1,75				38	0.5 %
10	AT	MZB_5_1,75				101	1.4 %
10	AT	MZB_7_1,5				33	0.4 %
10	AT	MZB_8_1,5				8	0.1 %
10	AT	MZB_9_1,75				9	0.1 %
11	AT	MZB_10_1,75				20	0.3 %
11	AT	MZB_11_1,5	2	1	4	221	3.0 %
11	AT	MZB_13_1,75	2	2	4	547	7.5 %
11	AT	MZB_15_1,5	2	2	4	224	3.1 %
11	AT	MZB_5_1,5	2	2	2	442	6.0 %
15	AT	MZB_5_1,25	3	1	2	267	3.6 %
15	AT	MZB_6_1				112	1.5 %
15	AT	MZB_6_1,25				183	2.5 %
15	AT	MZB_7_1				71	1.0 %
15	AT	MZB_7_1,25	3	2	2	198	2.7 %
15	AT	MZB_8_1,25				32	0.4 %

Broad River types revised	MS	National typology	Altitude	Catchment	Geology	WBs	% within MS
16	AT	MZB_2_1,25	3	3	1	603	8.2 %
16	AT	MZB_2_1,5	2	3	1	929	12.7 %
16	AT	MZB_3_1,5	3	3	1	716	9.8 %
1	BE (Fl)	Rzg	1	5	1	1	0.6 %
2	BE (Fl)	Rg	1	3-4	1	48	28.2 %
2	BE (Fl)	Rk	1	3	1	12	7.1 %
3	BE (Fl)	Bg	1	2-3	1	62	36.5 %
3	BE (Fl)	BgK	1	2-3	1	29	17.1 %
1	BE (W)	RIV_19	2	5	2	2	0.6 %
4	BE (W)	RIV_21	1	3	4	1	0.3 %
4	BE (W)	RIV_22	1	3	4	14	4.0 %
4	BE (W)	RIV_23	1	4	4	3	0.9 %
5	BE (W)	RIV_20	1	2	4	66	18.7 %
8	BE (W)	RIV_06	2	3	1	11	3.1 %
8	BE (W)	RIV_07	2	3	1	4	1.1 %
8	BE (W)	RIV_08	2	4	1	1	0.3 %
9	BE (W)	RIV_04	2	2	1	9	2.5 %
9	BE (W)	RIV_05	2	2	1	80	22.6 %
10	BE (W)	RIV_03	2	3	2	4	1.1 %
10	BE (W)	RIV_11	2	3	2	3	0.9 %
10	BE (W)	RIV_12	2	4	2	2	0.6 %
10	BE (W)	RIV_15	2	3	2	9	2.5 %
10	BE (W)	RIV_16	2	3	2	1	0.3 %
10	BE (W)	RIV_17	2	4	2	2	0.6 %
10	BE (W)	RIV_18	2	4	2	3	0.9 %
11	BE (W)	RIV_01	2	2	2	6	1.6 %
11	BE (W)	RIV_02	2	2	2	9	2.5 %
11	BE (W)	RIV_09	2	2	2	15	4.2 %
11	BE (W)	RIV_10	2	2	2	13	3.7 %
11	BE (W)	RIV_13	2	2	2	15	4.3 %
11	BE (W)	RIV_14	2	2	2	46	13.0 %
12	BE (W)	RIV_24	2	2	3	8	2.3 %
1	BG	R6	1	5	4		
2	BG	R12	1	5	1	8	
4	BG	R10	1	4	1, 2	4	
4	BG	R11	1	3	1, 2	69	
4	BG	R13	1	3	1, 2		
4	BG	R7	1	4	4		
4	BG	R8	1	3	4		
8	BG	R5	2	3	1		
9	BG	R4	2	2	1		
14	BG	R2	3	2	1		
14	BG	R3	3	2	1		
15	BG	R1	3	2	4		

Broad River types revised	MS	National typology	Altitude	Catchment	Geology	WBs	% within MS
20	BG	R14	2	3	4		
15	CY	R2				17	7.9 %
20	CY	R1			4	40	18.5 %
20	CY	R3			4	159	73.6 %
1	CZ	11148	1	5		5	0.5 %
1	CZ	41147	1	5		2	0.2 %
1	CZ	41148	1	5		7	0.7 %
1	CZ	42148	2	5		2	0.2 %
2	CZ	11124	1	3		6	0.6 %
2	CZ	11125	1	3		5	0.5 %
2	CZ	11126	1	3		1	0.1 %
2	CZ	21124	1	3		1	0.1 %
2	CZ	21125	1	3		3	0.3 %
2	CZ	21126	1	3		1	0.1 %
2	CZ	31125	1	3		1	0.1 %
2	CZ	41124	1	3		9	0.8 %
2	CZ	41125	1	3		12	1.1 %
3	CZ	11114	1	2		3	0.3 %
3	CZ	21114	1	2		2	0.2 %
3	CZ	21115	1	2		1	0.1 %
3	CZ	31114	1	2		3	0.3 %
3	CZ	41114	1	2		11	1.0 %
4	CZ	11224	1	3		3	0.3 %
4	CZ	11225	1	3		1	0.1 %
4	CZ	11226	1	3		2	0.2 %
4	CZ	21224	1	3		1	0.1 %
4	CZ	21226	1	3		1	0.1 %
4	CZ	41224	1	3		6	0.6 %
4	CZ	41225	1	3		2	0.2 %
4	CZ	41226	1	3		1	0.1 %
5	CZ	11214	1	2		6	0.6 %
5	CZ	21214	1	2		7	0.7 %
5	CZ	41214	1	2		7	0.7 %
8	CZ	22124	2	3		1	0.1 %
8	CZ	22125	2	3		1	0.1 %
8	CZ	22137	2	4		1	0.1 %
8	CZ	32124	2	3		6	0.6 %
8	CZ	32125	2	3		10	0.9 %
8	CZ	32126	2	3		2	0.2 %
8	CZ	32136	2	4		3	0.3 %
8	CZ	32137	2	4		1	0.1 %
8	CZ	42124	2	3		100	9.4 %
8	CZ	42125	2	3		91	8.5 %
8	CZ	42126	2	3		28	2.6 %

Broad River types revised	MS	National typology	Altitude	Catchment	Geology	WBs	% within MS
8	CZ	42135	2	4		2	0.2 %
8	CZ	42136	2	4		23	2.2 %
8	CZ	42137	2	4		11	1.0 %
8	CZ	43124	2	3		11	1.0 %
8	CZ	43125	2	3		7	0.7 %
8	CZ	43126	2	3		2	0.2 %
8	CZ	43136	2	4		1	0.1 %
9	CZ	12114	2	2		2	0.2 %
9	CZ	22114	2	2		9	0.8 %
9	CZ	22115	2	2		1	0.1 %
9	CZ	32113	2	2		2	0.2 %
9	CZ	32114	2	2		22	2.1 %
9	CZ	32115	2	2		1	0.1 %
9	CZ	42113	2	2		2	0.2 %
9	CZ	42114	2	2		298	27.9 %
9	CZ	42115	2	2		9	0.8 %
9	CZ	43114	2	2		81	7.6 %
9	CZ	43115	2	2		8	0.7 %
10	CZ	12225	2	3		1	0.1 %
10	CZ	22225	2	3		11	1.0 %
10	CZ	22226	2	3		4	0.4 %
10	CZ	22237	2	4		1	0.1 %
10	CZ	32224	2	3		1	0.1 %
10	CZ	32225	2	3		2	0.2 %
10	CZ	42224	2	3		8	0.7 %
10	CZ	42225	2	3		9	0.8 %
10	CZ	42226	2	3		4	0.4 %
10	CZ	42236	2	4		5	0.5 %
11	CZ	22214	2	2		70	6.5 %
11	CZ	22215	2	2		7	0.7 %
11	CZ	23214	2	2		11	1.0 %
11	CZ	23215	2	2		1	0.1 %
11	CZ	32214	2	2		4	0.4 %
11	CZ	42214	2	2		40	3.7 %
11	CZ	42215	2	2		2	0.2 %
11	CZ	43213	2	2		1	0.1 %
11	CZ	43214	2	2		4	0.4 %
14	CZ	44114	3	2		7	0.7 %
14	CZ	44115	3	2		2	0.2 %
1	DE	10	2	5	2	44	0.5 %
1	DE	20	1	5	2	49	0.5 %
1	DE	22.3	1	5	2	2	0.0 %
4	DE	15	1	3	4	284	3.1 %
4	DE	17	1	3	4	93	1.0 %

Broad River types revised	MS	National typology	Altitude	Catchment	Geology	WBs	% within MS
4	DE	15_G	1	4	2	16	0.2 %
5	DE	14	1	2	4	1302	14.3 %
5	DE	16	1	2	4	872	9.6 %
5	DE	18	1	2	2	298	3.3 %
8	DE	9	2	3	1	240	2.6 %
9	DE	5	2	2	1	1322	14.6 %
9	DE	5.1	2	2	1	294	3.2 %
10	DE	3.2	2	3	2	3	0.0 %
10	DE	4	2	4	2	29	0.3 %
10	DE	9.1	2	3	2	104	1.1 %
10	DE	9.2	2	4	2	99	1.1 %
10	DE	9.1_K	2	3	2	23	0.3 %
11	DE	3.1	2	2	2	53	0.6 %
11	DE	6	2	2	2	431	4.7 %
11	DE	7	2	2	2	304	3.4 %
11	DE	6_K	2	2	2	75	0.8 %
15	DE	1.1	3	2	2	40	0.4 %
15	DE	1.2	3	3	2	31	0.3 %
1	EE	4B	1	5	4	4	0.6 %
4	EE	2A	1	3	4	22	3.4 %
4	EE	2B	1	3	4	88	13.6 %
4	EE	3A	1	4	4	2	0.3 %
4	EE	3B	1	4	4	15	2.3 %
5	EE	1A	1	2	4	128	19.8 %
5	EE	1B	1	2	2	385	59.7 %
17	EL	LOW-L-C	1	4	2	93	9.0 %
17	EL	LOW-L-S	1	4	1	135	13.1 %
17	EL	LOW-M-C	1	3	2	98	9.5 %
17	EL	LOW-M-S	1	3	1	107	10.4 %
18	EL	MID-L-C	2	4	2	84	8.1 %
18	EL	MID-L-S	2	4	1	114	11.0 %
18	EL	MID-M-C	2	3	2	72	7.0 %
18	EL	MID-M-S	2	3	1	95	9.2 %
19	EL	LOW-S-C	1	2	2	53	5.1 %
1	FI	Esk	1	5	4	16	1.0 %
1	FI	Esk-P	2	5	4	1	0.1 %
1	FI	ESt	1	5	3	6	0.4 %
2	FI	Kk	1	3	1	275	17.2 %
3	FI	Pk	1	2	1	151	9.4 %
6	FI	Kt	1	3	3	532	33.2 %
6	FI	Pt	1	2	3	281	17.5 %
10	FI	Sk-Po	2	4	4	9	0.6 %
13	FI	St-Po	2	4	3	1	0.1 %
1	FR	TG10-15/4	1	5	4	3	0.0 %

Broad River types revised	MS	National typology	Altitude	Catchment	Geology	WBs	% within MS
1	FR	TG14/1	1	5	4	5	0.0 %
1	FR	TG14/3-11	1	5	4	9	0.1 %
1	FR	TG15	1	5	2	5	0.0 %
1	FR	TG17/3-21	2	5	1	2	0.0 %
1	FR	TG22/10	1	5	4	2	0.0 %
1	FR	TG5/2	2	5	4	5	0.0 %
1	FR	TG9	1	5	2	3	0.0 %
1	FR	TG9/21	1	5	2	4	0.0 %
1	FR	TTGA	2	5	4	27	0.2 %
1	FR	TTGL	1	5	4	9	0.1 %
2	FR	G12	1	4	1	11	0.1 %
2	FR	G18/4	1	4	1	7	0.1 %
2	FR	GM20	1	4	1	9	0.1 %
2	FR	P12-A	1	3	1	125	1.2 %
2	FR	P12-B	1	3	1	107	1.0 %
3	FR	TP12-A	1	2	1	405	3.7 %
3	FR	TP12-B	1	2	1	183	1.7 %
3	FR	TP13	1	2	1	180	1.7 %
4	FR	G11/3-21	1	4	4	4	0.0 %
4	FR	G14/3	1	4	4	3	0.0 %
4	FR	G9	1	4	2	30	0.3 %
4	FR	G9-10/21	1	4	2	2	0.0 %
4	FR	GM14	1	4	4	13	0.1 %
4	FR	GM20/9	1	4	4	3	0.0 %
4	FR	P14	1	3	4	224	2.1 %
4	FR	P9	1	3	2	300	2.8 %
4	FR	TG11/3-21	1	4	4	1	0.0 %
5	FR	TP14	1	2	4	752	6.9 %
5	FR	TP15	1	2	2	184	1.7 %
5	FR	TP9	1	2	2	1329	12.3 %
8	FR	G17/3-21	2	4	1	6	0.1 %
8	FR	G21	2	4	1	9	0.1 %
8	FR	G3	2	4	1	10	0.1 %
8	FR	GM22	2	4	1	3	0.0 %
8	FR	GM8	2	4	1	23	0.2 %
8	FR	P21	2	3	1	120	1.1 %
8	FR	P3	2	3	1	183	1.7 %
9	FR	TP21	2	2	1	357	3.3 %
9	FR	TP4	2	2	1	133	1.2 %
10	FR	G10	2	4	2	9	0.1 %
10	FR	G10/4	2	4	4	10	0.1 %
10	FR	G3/19-8	2	4	2	5	0.0 %
10	FR	G5	2	4	2	7	0.1 %
10	FR	GM19/8	2	4	4	7	0.1 %

Broad River types revised	MS	National typology	Altitude	Catchment	Geology	WBs	% within MS
10	FR	GM5/2	2	4	4	4	0.0 %
11	FR	TP10	2	2	2	599	5.5 %
11	FR	TP11	2	2	2	130	1.2 %
14	FR	TP3	3	2	1	577	5.3 %
15	FR	TP5	3	2	2	361	3.3 %
15	FR	TP7	3	2	2	215	2.0 %
16	FR	G1	2	4	4	3	0.0 %
16	FR	G14/1	2	4	4	16	0.1 %
16	FR	G2	2	4	4	10	0.1 %
16	FR	GM7/2	2	4	4	5	0.0 %
16	FR	M1	3	3	4	19	0.2 %
16	FR	P1				88	0.8 %
16	FR	TP1	3	2	4	255	2.4 %
16	FR	TP2	3	2	1	277	2.6 %
17	FR	G16	1	4	1	4	0.0 %
17	FR	G6	1	4	2	6	0.1 %
17	FR	GM6/1	1	4	4	6	0.1 %
18	FR	GM6/2-7	2	4	4	16	0.1 %
18	FR	GM6/8	2	4	4	21	0.2 %
18	FR	GMP7	2	4	2	32	0.3 %
18	FR	TG6/1-8	2	4	4	2	0.0 %
19	FR	PTP16-A	2	2	1	166	1.5 %
19	FR	PTP8	2	2	1	164	1.5 %
19	FR	TP6	1	2	4	510	4.7 %
1	HR	HR-R_5A	1	5	4	2	0.2 %
1	HR	HR-R_5B	1	5	4	4	0.4 %
1	HR	HR-R_5C	1	5	1	2	0.2 %
1	HR	HR-R_5D	1	5	1	1	0.1 %
3	HR	HR-R_3A	1	2	1	6	0.5 %
4	HR	HR-R_4	1	3, 4	4	66	6.0 %
4	HR	HR-R_8	1	3, 4	4	4	0.4 %
5	HR	HR-R_2A	1	2	4	399	36.4 %
5	HR	HR-R_2B	1	2	4	196	17.9 %
10	HR	HR-R_10B	2	3	2	2	0.2 %
10	HR	HR-R_7	2	3, 4	4	12	1.1 %
10	HR	HR-R_9	2	3	2	8	0.7 %
11	HR	HR-R_1	2	2	4	69	6.3 %
11	HR	HR-R_10A	2	2	2	62	5.7 %
11	HR	HR-R_6	2	2	4	36	3.3 %
17	HR	HR-R_13	1	3, 4	2	4	0.4 %
17	HR	HR-R_13A	1	4	2	2	0.2 %
17	HR	HR-R_18	1	3	4	5	0.5 %
18	HR	HR-R_12	2	3, 4	2	8	0.7 %
19	HR	HR-R_11	1, 2	2	4	10	0.9 %

Broad River types revised	MS	National typology	Altitude	Catchment	Geology	WBs	% within MS
19	HR	HR-R_16B	1	2	4	62	5.7 %
19	HR	HR-R_17	1, 2	2	4	15	1.4 %
19	HR	HR-R_19	1	2, 3	4	20	1.8 %
1	HU	14R	1	5	2	3	0.3 %
1	HU	20R	1	5	2	12	1.4 %
1	HU	23R	1	5	2	1	0.1 %
1	HU	24R	1	5	2	2	0.2 %
1	HU	25R	1	5	2	1	0.1 %
1	HU	7R	1	5	2	2	0.2 %
4	HU	13R	1	4	2	8	0.9 %
4	HU	18R	1	3	2	91	10.5 %
5	HU	11R				7	0.8 %
5	HU	15R	1	2, 3	2	46	5.3 %
5	HU	16R	1	2, 3	2	29	3.3 %
5	HU	17R	1	2, 3	2	53	6.1 %
9	HU	1R	2			28	3.2 %
10	HU	10R	1, 2	4	2	4	0.5 %
10	HU	5R	1, 2	3	2	40	4.6 %
10	HU	6R	1, 2	4	2	9	1.0 %
10	HU	9R	1, 2	3	2	94	10.8 %
11	HU	4R	2	2, 3	2	71	8.2 %
11	HU	8R	1, 2	2, 3	2	138	15.9 %
3	IE	11	1	2	1	279	6.1 %
3	IE	12	1	2	1	801	17.5 %
3	IE	13	1	2	1	361	7.9 %
3	IE	14	1	2	1	374	8.2 %
5	IE	21			4	155	3.4 %
5	IE	22			4	272	6.0 %
5	IE	23			4	87	1.9 %
5	IE	24			4	58	1.3 %
5	IE	31	1	2	2	1299	28.4 %
5	IE	32	1	2	2	670	14.7 %
5	IE	33			2	109	2.4 %
5	IE	34			2	58	1.3 %
4	IT	IT06SS3F	1	3	4	64	0.8 %
5	IT	IT06AS2T	1	2	4	34	0.4 %
5	IT	IT06AS6T	1	1	4	129	1.7 %
5	IT	IT06SR6T	1	1	4	30	0.4 %
5	IT	IT06SS1T	1	2	4	74	1.0 %
8	IT	IT03SS3N	2	3	1	32	0.4 %
9	IT	IT03GH6N	2	1	1	56	0.7 %
9	IT	IT03SR6N	2	1	1	97	1.3 %
9	IT	IT03SS1N	2	2	1	256	3.3 %
9	IT	IT03SS2N	2	2	1	162	2.1 %

Broad River types revised	MS	National typology	Altitude	Catchment	Geology	WBs	% within MS
11	IT	IT02SR6N	2	1	2	55	0.7 %
11	IT	IT02SR6T	2	1	2	93	1.2 %
11	IT	IT02SS1N	2	2	2	48	0.6 %
11	IT	IT02SS1T	2	2	2	229	3.0 %
11	IT	IT02SS2N	2	2	2	34	0.4 %
11	IT	IT02SS2T	2	2	2	115	1.5 %
11	IT	IT06SS2T	2	2	4	172	2.3 %
11	IT	IT10SS1N	2	2	2	93	1.2 %
11	IT	IT10SS2N	2	2	2	182	2.4 %
14	IT	IT03GH1N	3	2	1	29	0.4 %
16	IT	IT01GH1N	3	2	1	45	0.6 %
16	IT	IT01GH2N	2	2	1	45	0.6 %
16	IT	IT01SS1N	2	2	1	105	1.4 %
16	IT	IT01SS2N	2	2	1	77	1.0 %
16	IT	IT04SS2N	2	2	1	58	0.8 %
17	IT	IT06SS3T	1	3	4	48	0.6 %
17	IT	IT06SS4D	1	3	4	46	0.6 %
17	IT	IT06SS4F	1	3	4	28	0.4 %
18	IT	IT10SS3N	2	3	2	71	0.9 %
18	IT	IT13AS3N	2	3	2	34	0.4 %
18	IT	IT19SS3N	2	3	1	34	0.4 %
18	IT	IT21SS3T	2	3	1	32	0.4 %
19	IT	IT09SS2T	2	2	2	37	0.5 %
19	IT	IT10SS2T	2	2	2	61	0.8 %
19	IT	IT11SS2N	2	2	4	51	0.7 %
19	IT	IT11SS2T	2	2	4	28	0.4 %
19	IT	IT13SR2T	2	2	2	47	0.6 %
19	IT	IT14SS2T	1	2	1	29	0.4 %
19	IT	IT19SR1N	2	2	1	30	0.4 %
19	IT	IT19SR2N	2	2	1	34	0.4 %
19	IT	IT19SS1N	2	2	1	39	0.5 %
19	IT	IT19SS2N	2	2	1	48	0.6 %
19	IT	IT21SS2T	2	2	1	32	0.4 %
20	IT	IT02IN7N				34	0.4 %
20	IT	IT02IN7T				88	1.2 %
20	IT	IT06IN7D				66	0.9 %
20	IT	IT06IN7N				84	1.1 %
20	IT	IT10EF7N				63	0.8 %
20	IT	IT10IN7N				139	1.8 %
20	IT	IT11EF7N				181	2.4 %
20	IT	IT11IN7N				172	2.3 %
20	IT	IT11IN7T				40	0.5 %
20	IT	IT12IN7N				36	0.5 %
20	IT	IT19EF7N				50	0.7 %

Broad River types revised	MS	National typology	Altitude	Catchment	Geology	WBs	% within MS
20	IT	IT19IN7N				94	1.2 %
20	IT	IT19IN8N				34	0.4 %
20	IT	IT20IN7N				153	2.0 %
20	IT	IT21EF7T				453	5.9 %
20	IT	IT21IN7T				151	2.0 %
4	LT	RWT2	1	3	2	93	11.2 %
4	LT	RWT3	1	3	2	112	13.5 %
4	LT	RWT4	1	4	2	14	1.7 %
4	LT	RWT5	1	4	2	24	2.9 %
5	LT	RWT1	1	2	2	589	70.8 %
4	LU	5	1	3		9	8.3 %
4	LU	6	1	4		4	3.7 %
5	LU	4	1	2		47	43.5 %
8	LU	3	2	3		11	10.2 %
9	LU	1	2	2		28	25.9 %
9	LU	2	2	2		8	7.4 %
4	LV	R3	1	3	2	79	38.7 %
4	LV	R4	1	3	2	65	31.9 %
4	LV	R5	1	4	2	10	4.9 %
4	LV	R6	1	4	2	46	22.7 %
5	LV	R1	1	2	2	3	1.5 %
5	LV	R2	1	2	2	1	0.5 %
1	NL	R7		5		11	4.3 %
5	NL	R4	1	1	2	47	18.5 %
5	NL	R5	1	2	2	133	52.4 %
5	NL	R6	1	2	2	30	11.8 %
3	NO	1	1		1		
3	NO	2	1		1		
3	NO	4	1		1		
3	NO	5	1		1		
3	NO	7	1		1		
5	NO	9	1		2		
6	NO	3	1		1, 3		
6	NO	6	1		1, 3		
6	NO	8	1		1, 3		
7	NO	10	1		2		
7	NO	11	1		3, 4		
9	NO	12	2		1		
9	NO	13	2		1		
9	NO	15	2		1		
9	NO	16	2		1		
9	NO	18	2		1		
12	NO	14	2		1, 3		
12	NO	17	2		1, 3		

Broad River types revised	MS	National typology	Altitude	Catchment	Geology	WBs	% within MS
12	NO	19	2		1, 3		
14	NO	20	3		1		
14	NO	21	3		1		
14	NO	22	3		1, 3		
14	NO	23	3		1		
14	NO	24	3		1		
14	NO	25	3		1, 3		
1	PL	21	1	5	2	75	1.6 %
3	PL	17	1	2	1	1792	39.1 %
3	PL	18	1	2	1	299	6.5 %
4	PL	19	1	4	2	271	5.9 %
5	PL	16	1	2	2	295	6.4 %
6	PL	23	1	2	3	314	6.8 %
8	PL	8	2	3	1	35	0.8 %
9	PL	4	2	2	1	117	2.6 %
9	PL	5	2	2	1	33	0.7 %
9	PL	12	2	2	1	274	6.0 %
10	PL	9	2	3	2	46	1.0 %
11	PL	6	2	2	2	323	7.0 %
11	PL	7	2	2	2	53	1.2 %
13	PL	24	2	4	3	98	2.1 %
14	PL	1	3	2	1	4	0.1 %
15	PL	2	3	2	2	2	0.0 %
1	PT	R_GRC	1	5	4	3	0.2 %
1	PT	R_GRN	1	5	1	1	0.1 %
1	PT	R_GRS	1	5	4	4	0.2 %
17	PT	R_L	1	2, 3, 4	4	92	5.7 %
17	PT	R_S1G	1	3, 4	1	92	5.7 %
17	PT	R_S3	1	2, 3, 4	1, 2	175	10.9 %
19	PT	R_N1P	2	2	1	397	24.6 %
19	PT	R_N3	2	2	1	109	6.8 %
20	PT	R_S1P	1	2	1	422	26.2 %
20	PT	R_S4	1	2, 3	2	33	2.0 %
1	RO	RO12	1	5	2	2	0.1 %
1	RO	RO13	1	5	1	1	0.0 %
1	RO	RO14	1	5	1	1	0.0 %
1	RO	RO15	1	5	4	3	0.1 %
4	RO	RO07	1	4	4	19	0.6 %
4	RO	RO08	1	4	4	4	0.1 %
4	RO	RO09	1	4	4	1	0.0 %
4	RO	RO10	1	4	4	6	0.2 %
4	RO	RO10*	1	4	4	40	1.2 %
4	RO	RO11	1	4	4	10	0.3 %
4	RO	RO11*	1	4	4	5	0.2 %

Broad River types revised	MS	National typology	Altitude	Catchment	Geology	WBs	% within MS
5	RO	RO06	1	2, 3	4	156	4.8 %
10	RO	RO02	2, 3	4	4	11	0.3 %
10	RO	RO05	2	4	4	47	1.4 %
11	RO	RO01	2, 3	2, 3	4	900	27.6 %
11	RO	RO04	2	2, 3	4	359	11.0 %
20	RO	RO17	3	2, 3	1	10	0.3 %
20	RO	RO18	3	2	4	137	4.2 %
20	RO	RO19	2	2	4	574	17.6 %
20	RO	RO20	1	3	4	335	10.3 %
2	SE	V3LNN	1	3, 4, 5	1	291	1.9 %
2	SE	V4LNN	1	3, 4, 5	1	42	0.3 %
2	SE	V5LNN	1	3, 4, 5	1	1	0.0 %
2	SE	V6LNN	1	3, 4, 5	1	59	0.4 %
3	SE	V3SNN	1	1, 2	1	610	3.9 %
3	SE	V4SNN	1	1, 2	1	141	0.9 %
3	SE	V5SNN	1	1, 2	1	3	0.0 %
3	SE	V6SNN	1	1, 2	1	104	0.7 %
4	SE	V3LNY	1	3, 4, 5	2	4	0.0 %
4	SE	V4LNY	1	3, 4, 5	2	21	0.1 %
4	SE	V5LNY	1	3, 4, 5	2	30	0.2 %
4	SE	V6LNY	1	3, 4, 5	2	1	0.0 %
5	SE	V3SNY	1	1, 2	2	15	0.1 %
5	SE	V4SNY	1	1, 2	2	46	0.3 %
5	SE	V5SNY	1	1, 2	2	42	0.3 %
5	SE	V6SNY	1	1, 2	2	3	0.0 %
6	SE	V3LYN	1	3, 4, 5	1, 3	946	6.1 %
6	SE	V3SYN	1	1, 2	1, 3	2287	14.7 %
6	SE	V4LYN	1	3, 4, 5	1, 3	218	1.4 %
6	SE	V4SYN	1	1, 2	1, 3	577	3.7 %
6	SE	V5LYN	1	3, 4, 5	1, 3	40	0.3 %
6	SE	V5SYN	1	1, 2	1, 3	67	0.4 %
6	SE	V6LYN	1	3, 4, 5	1, 3	292	1.9 %
6	SE	V6SYN	1	1, 2	1, 3	493	3.2 %
7	SE	V3LYY	1	3, 4, 5	2, 3	3	0.0 %
7	SE	V3SYY	1	1, 2	2, 3	14	0.1 %
7	SE	V4LYY	1	3, 4, 5	2, 3	67	0.4 %
7	SE	V4SYY	1	1, 2	2, 3	168	1.1 %
7	SE	V5LYY	1	3, 4, 5	2, 3	20	0.1 %
7	SE	V5SYY	1	1, 2	2, 3	17	0.1 %
7	SE	V6LYY	1	3, 4, 5	2, 3	32	0.2 %
7	SE	V6SYY	1	1, 2	2, 3	32	0.2 %
8	SE	V2LNN	2	3, 4, 5	1	1364	8.8 %
8	SE	V7LNN	2	3, 4, 5	1	3	0.0 %
9	SE	V2SNN	2	1, 2	1	3047	19.6 %

Broad River types revised	MS	National typology	Altitude	Catchment	Geology	WBs	% within MS
9	SE	V7SNN	2	1, 2	1	17	0.1 %
10	SE	V2LNY	2	3, 4, 5	2	104	0.7 %
11	SE	V2SNY	2	1, 2	2	77	0.5 %
12	SE	V2LYN	2	3, 4, 5	1, 3	738	4.7 %
12	SE	V2SYN	2	1, 2	1, 3	2363	15.2 %
12	SE	V7LYN	2	3, 4, 5	1, 3	36	0.2 %
12	SE	V7SYN	2	1, 2	1, 3	145	0.9 %
13	SE	V2LYY	2	3, 4, 5	2, 3	28	0.2 %
13	SE	V2SYY	2	1, 2	2, 3	20	0.1 %
13	SE	V7LYY	2	3, 4, 5	2, 3	2	0.0 %
13	SE	V7SYY	2	1, 2	2, 3	5	0.0 %
14	SE	V1LNN	3	3, 4, 5	1	123	0.8 %
14	SE	V1SNN	3	1, 2	1	778	5.0 %
15	SE	V1LNY	3	3, 4, 5	2	4	0.0 %
15	SE	V1SNY	3	1, 2	2	7	0.0 %
1	SI	11VA		5	2	2	1.6 %
1	SI	11VS		5	1	2	1.6 %
20	SI	JDP	2		2	1	
1	SK	D1(P1V)	1	5	4	4	0.2 %
1	SK	D2(P1V)	1	5	4	1	0.1 %
4	SK	B1(P1V)	1	4	4	7	0.4 %
4	SK	I1(P1V)	1	4	4	1	0.1 %
4	SK	M1(P1V)	1	4	4	2	0.1 %
4	SK	P1S	1	3	4	28	1.6 %
4	SK	R2(P1V)	1	4	4	1	0.1 %
4	SK	V3(P1V)	1	4	4	8	0.5 %
5	SK	P1M	1	2	4	259	15.0 %
10	SK	H1(K2V)	2	4	4	2	0.1 %
10	SK	H2(K2V)	2	4	4	1	0.1 %
10	SK	K2S	2	3	4	48	2.8 %
10	SK	K3S	2	3	4	11	0.6 %
10	SK	P1(K3V)	2	4	4	1	0.1 %
10	SK	P2(K3V)	2	4	4	1	0.1 %
10	SK	P2S	2	3	4	4	0.2 %
10	SK	R1(K2V)	2	4	4	1	0.1 %
10	SK	S(K2V)	2	4	4	2	0.1 %
10	SK	V1(K3V)	2	4	4	3	0.2 %
10	SK	V2(K2V)	2	4	4	2	0.1 %
11	SK	K2M	2	2	2	592	34.3 %
11	SK	P2M	2	2	4	60	3.5 %
15	SK	K3M	3	2	4	492	28.5 %
15	SK	K4M	3	2	4	195	11.3 %
2	UK	4	1	3	1	99	1.2 %
2	UK	7	1	4	1	6	0.1 %

Broad River types revised	MS	National typology	Altitude	Catchment	Geology	WBs	% within MS
3	UK	1	1	2	1	1053	12.6 %
3	UK	37	1	1	1	432	5.2 %
4	UK	5	1	3	2	429	5.1 %
4	UK	8	1	4	2	63	0.8 %
5	UK	2	1	2	2	3088	37.0 %
5	UK	40	1	1	2	342	4.1 %
6	UK	3	1	2	3	136	1.6 %
6	UK	6	1	3	3	2	0.0 %
6	UK	9	1	4	3	7	0.1 %
6	UK	43	1	1	3	1	0.0 %
8	UK	13	2	3	1	246	3.0 %
8	UK	16	2	4	1	25	0.3 %
9	UK	10	2	2	1	1426	17.1 %
10	UK	14	2	3	2	91	1.1 %
10	UK	17	2	4	2	21	0.3 %
11	UK	11	2	2	2	612	7.3 %
14	UK	18	3	2	1	5	0.1 %

Notes for specific countries concerning national river types and links to broad types:

Country	Comment
LU-Rivers	New national typology, so no status and pressures info is available. Links between old and new national typology received after mid-September, which was too late to include in the analysis.
SI-Rivers	Altitude is not used in national river typology, so no link to broad types possible for any of the Slovenian national types, except the very large rivers.
UK-Rivers	Number of river water bodies corrected per type. National types 12 (Mid-altitude, organic small) and 15 (Mid-altitude, organic medium) are not linked to any broad type, because there is no info on alkalinity, and no suggestion for any broad type done by the contact person. National river type 3 (Lowland, Organic, small rivers), 6 (Lowland, organic, medium rivers) and 43 ((Lowland, Organic, very small rivers) are all allocated to broad type 6 (Lowland, organic and siliceous), because the UK contact person suggested that these rivers are siliceous/organic. When the UK agencies next report their lake typology they will use a new set of more uniform codes for the national typology, as the codes used in the past were not consistent and result in duplicate codes for the same lake type. The typology will not change but these new codes would need to be matched to the Broad types.
NO-Rivers	Catchment size is not used as a typology factor in the Norwegian river typology, causing several national types to overlap 2 broad types (e.g. Mid-altitude, siliceous rivers national types 12,13,15,16 fit with broad types 8 and 9). Assuming that most water bodies in those national types have <100km^2 catchment, the ETC has allocated these national types to the broad type with catchment < 100km^2 (e.g. broad type 9 Mid-altitude, siliceous, very small-small).
RO-Rivers	The links between the broad types and the national river types RO01, 02, 04, 06 are reasonable for most of the water bodies, but may not fit for all the water bodies of the type, as the national types overlap several of the altitude, size, and/or geology categories of the broad types.
IT-Rivers	The links between national Italian river types and broad types is an approximation elaborated by the ETC and is not reflecting a formal position of the Member State. Caution should be taken when applying these links in future reports. More specific comments may be sent in 2015.

B) Lakes: Links between the broad types and 290 national types

MS = Member State (or Norway), WBs = Water bodies, Broad lake type codes are described in table 3.13, and codes for Altitude, Catchment size and Geology are described in table 3.10, chapter 3.

Broad Lake types revised	MS	National typology	Altitude	Area	Geology	Mean depth	WBs	% within MS
1	AT	B1	2	5	4	3	1	1.6 %
4	AT	A1	1	5		1	1	1.6 %
7	AT	D3					2	3.2 %
8	AT	B2	2	3	4	2	5	8.1 %
8	AT	C1a	2		2	3	3	4.8 %
8	AT	C1b	2	3	4	2	4	6.5 %
8	AT	D1	2	4	2	3	6	9.7 %
8	AT	D2a	2	2	2	3	3	4.8 %
8	AT	D2b	2	2	2	2	3	4.8 %
12	AT	E1	3	3	2	3	10	16.1 %
12	AT	E2					1	1.6 %
3	BE (Fl)	Awe	1	2, 3	2		7	38.9 %
3	BE (Fl)	Awom	1	2, 3	2		1	5.6 %
4	BE (Fl)	Ai	1	2	2		1	5.6 %
4	BE (Fl)	Ami	1	2	2		5	27.8 %
1	BG	L11		5		3		
3	BG	L14	1	4	4	2		
3	BG	L15	1	4	4	2		
3	BG	L16	1	3	4	2		
3	BG	L17	1	3	4	2		
4	BG	L4	1	1	4	1		
8	BG	L12	2	3	4	3		
8	BG	L13	2	3	4	3		
11	BG	L1	3	1	4	2-3		
11	BG	L2	3	1	1, 4	2		
11	BG	L3	3	1	1, 4	2		
14	CY	L4					11	61.1 %
2	CZ	311322	1	4	1	2	1	1.4 %
4	CZ	311211	1	3	1	1	1	1.4 %
4	CZ	311212	1	3	1	1	1	1.4 %
4	CZ	411112	1	2	1	1	1	1.4 %
7	CZ	221122	2	2	1	2	1	1.4 %
7	CZ	221223	2	3	1	2	1	1.4 %
7	CZ	321222	2	3	1	2	1	1.4 %
7	CZ	421112	2	2	1	1	5	7.0 %
7	CZ	421121	2	2	1	2	1	1.4 %
7	CZ	421122	2	2	1	2	6	8.5 %
7	CZ	421123	2	2	1	2	1	1.4 %
7	CZ	421132	2	2	1	3	1	1.4 %
7	CZ	421133	2	2	1	3	1	1.4 %
7	CZ	421211	2	3	1	1	2	2.8 %
7	CZ	421212	2	3	1	1	7	9.9 %

Broad Lake types revised	MS	National typology	Altitude	Area	Geology	Mean depth	WBs	% within MS
7	CZ	421221	2	3	1	2	1	1.4 %
7	CZ	421222	2	3	1	2	6	8.5 %
7	CZ	421231	2	3	1	3	1	1.4 %
7	CZ	421232	2	3	1	3	3	4.2 %
7	CZ	421332	2	4	1	3	5	7.0 %
7	CZ	421333	2	4	1	3	1	1.4 %
7	CZ	431111	2	2	1	1	1	1.4 %
7	CZ	431122	2	2	1	2	6	8.5 %
7	CZ	431222	2	3	1	2	3	4.2 %
7	CZ	431223	2	3	1	2	1	1.4 %
7	CZ	431232	2	3	1	3	4	5.6 %
7	CZ	431233	2	3	1	3	2	2.8 %
7	CZ	431322	2	4	1	2	1	1.4 %
8	CZ	222122	2	2	2	2	1	1.4 %
8	CZ	222222	2	3	2	2	1	1.4 %
8	CZ	232122	2	2	2	2	1	1.4 %
8	CZ	232232	2	3	2	3	1	1.4 %
8	CZ	422223	2	3	2	2	1	1.4 %
3	DE	10	1	4	2	2	155	21.8 %
3	DE	13	1	2	2	2	93	13.1 %
7	DE	8		4		3	17	2.4 %
8	DE	6		4		2	17	2.4 %
2	EE	5	1	3	2	1	1	1.1 %
3	EE	1	1	1	2	3	1	1.1 %
3	EE	3	1	1, 2, 3	2	2	22	24.7 %
3	EE	6	1	5	4	2	1	1.1 %
3	EE	7	1	5	4	2	2	2.2 %
4	EE	2	1	3	2	1	33	37.0 %
6	EE	4	1	1, 2, 3	4	1	6	6.7 %
12	EL	HIGH-D-L-C	3	4	2	3	1	3.4 %
12	EL	HIGH-D-S-C	3	3	2	3	1	3.4 %
12	EL	HIGH-D-XL-C	3	5	2	3	1	3.4 %
13	EL	LOW-D-L-S	1	4	1	3	3	10.3 %
13	EL	LOW-S-L-S	1	4	1	1	4	13.8 %
13	EL	LOW-S-M-S	1	4	1	1	1	3.4 %
13	EL	LOW-S-S-S	1	2	1	1	1	3.4 %
13	EL	MID-D-L-S	2	4	1	3	1	3.4 %
14	EL	LOW-D-L-C	1	4	2	3	1	3.4 %
14	EL	LOW-D-M-C	1	4	2	3	1	3.4 %
14	EL	LOW-S-L-C	1	4	2	1	3	10.3 %
1	FI	Sh	1	5	3	2	44	1.0 %
1	FI	SVh	1	5	1	2	68	1.6 %
2	FI	Vh	1	4	1	2	618	14.5 %
5	FI	Ph	1	3	3	2	578	13.5 %
1	FR	A52	1	5		3	1	0.2 %
3	FR	A16	1	3	2	2	25	5.7 %
3	FR	A6b	1	3	4	2	54	12.3 %
7	FR	A4	2	2	1	2	14	3.2 %
8	FR	A13a	2	3	4	1	30	6.8 %

Broad Lake types revised	MS	National typology	Altitude	Area	Geology	Mean depth	WBs	% within MS
8	FR	A5	2	3	4	2	73	16.6 %
8	FR	A7a	2	3	2	1	20	4.6 %
8	FR	A7b	2	3	4	2	15	3.4 %
8	FR	N4	2	4	2	3	20	4.6 %
11	FR	A1	3	3	1	3	20	4.6 %
14	FR	A3	2	3	2	3	14	3.2 %
8	HR	HR-J_1A	2	2	2	3	1	
8	HR	HR-J_1B	2	2	2	2	1	
14	HR	HR-J_2	1	3	2	3	1	
14	HR	HR-J_3	1	2	2	2	1	
14	HR	HR-J_4	1	4	2	1	1	
14	HR	HR-J_5	1	3	2	2	1	
3	HU	13L	1	3	2	2	30	14.1 %
3	HU	15L	1	4	2	2	6	2.8 %
4	HU	16L	1	5	2	1	1	0.5 %
6	HU	1L	1		3		1	0.5 %
6	HU	2L	1		3	2	5	2.3 %
6	HU	3L	1	2	3	1	2	0.9 %
2	IE	1		1			14	5.9 %
2	IE	2	1	2	1	1	23	9.7 %
2	IE	3		1			9	3.8 %
2	IE	4	1	2	1	2	42	17.6 %
3	IE	7		1			13	5.5 %
3	IE	8	1	2	2	2	22	9.2 %
3	IE	11		1			3	1.3 %
3	IE	12	1	2	2	2	24	10.1 %
4	IE	5	1	1	2	1	16	6.7 %
4	IE	6	1	2	2	1	32	13.4 %
4	IE	9		1			11	4.6 %
4	IE	10	1	2	2	1	27	11.3 %
7	IE	13					2	0.8 %
1	IT	ITAL-3	2	5	2	3	12	4.0 %
3	IT	ITAL-5	2	3	4	2	26	8.7 %
4	IT	ITAL-4					12	4.0 %
7	IT	ITAL-8	2		1		4	1.3 %
11	IT	ITAL-10	3	3	1	3	29	9.7 %
11	IT	ITAL-2	3	2	1	3	19	6.3 %
12	IT	ITAL-1					4	1.3 %
12	IT	ITAL-7	2		2		9	3.0 %
12	IT	ITAL-9	2		2		8	2.7 %
13	IT	ITME-3					8	2.7 %
13	IT	ITME-5					4	1.3 %
14	IT	ITME-1	2	4	4	1	21	7.0 %
14	IT	ITME-2			2		38	12.7 %
14	IT	ITME-4	2	3	2	3	27	9.0 %
14	IT	ITME-6					1	0.3 %
3	LT	LWT2	1		2	2	172	49.9 %
3	LT	LWT3	1		2	2	43	12.4 %
4	LT	LWT1	1		2	1	130	37.7 %

Broad Lake types revised	MS	National typology	Altitude	Area	Geology	Mean depth	WBs	% within MS
3	LV	L5	1	2,3	2	2	159	61.4 %
3	LV	L7	1	2,3	2	2	2	0.8 %
4	LV	L1	1	2,3	2	1	37	14.3 %
4	LV	L2	1	2,3	2	1	23	8.9 %
5	LV	L4	1	2,3	3	1	7	2.7 %
5	LV	L8	1	2,3	1	2	4	1.5 %
6	LV	L6	1	2,3	2	2	13	5.0 %
3	NL	M20	1	3	2	2	29	6.4 %
3	NL	M21	1	5	4	2	2	0.4 %
4	NL	M14	1	3	2	1	51	11.3 %
6	NL	M27	1	3	3	2	25	5.6 %
2	NO	1	1		1	2		
2	NO	2	1		1	2		
2	NO	4	1		1	2		
2	NO	5	1		1	2		
2	NO	6	1		1	3		
2	NO	8	1		1, 4	2		
3	NO	10	1		2	1, 2		
5	NO	3	1		1, 3	2		
5	NO	7	1		1, 3	2		
5	NO	9	1		1, 3	2		
6	NO	11	1		2, 3	1, 2		
7	NO	12	2		1	2		
7	NO	13	2		1	2		
7	NO	15	2		1	2		
7	NO	16	2		1	2		
7	NO	18	2		1, 4	2		
9	NO	14	2		1, 3	2		
9	NO	17	2		1, 3	2		
9	NO	19	2		1, 3	2		
11	NO	20	3		1	2		
11	NO	21	3		1	2		
11	NO	22	3		1, 3	2		
11	NO	23	3		1	2		
11	NO	24	3		1	2		
11	NO	25	3		1, 3	2		
3	PL	2a	1	3	2	2	111	10.6 %
3	PL	3a	1	3	2	2	254	24.3 %
3	PL	6a	1	3	2	2	133	12.7 %
4	PL	3b	1	2	2	1	296	28.4 %
13	PT	B-L-M/MI/S/PP	2, 3	2, 3	1	1	13	10.7 %
13	PT	B-L-M/MI-MP/S/P	2, 3	3, 4, 5	1	2	11	9.0 %
13	PT	L_N	1	2, 3, 4	1		37	30.3 %
13	PT	L_S	1	2, 3, 4	1		46	37.7 %
3	RO	ROLN14T	1	3	4	2	5	3.8 %
4	RO	ROLN01	1	2	1	1	18	13.7 %
4	RO	ROLN02	1	3	1	1	18	13.7 %

Broad Lake types revised	MS	National typology	Altitude	Area	Geology	Mean depth	WBs	% within MS
4	RO	ROLN05	1	4	2	1	6	4.6 %
4	RO	ROLN06	1	5	2	1	1	0.8 %
6	RO	ROLN07	1	2	3	1	10	7.6 %
6	RO	ROLN08	1	3	3	1	34	26.0 %
6	RO	ROLN09	1	4	3	1	8	6.1 %
2	SE	S3DLNN	1	4, 5	1	2, 3	34	0.5 %
2	SE	S3DSNN	1	1, 2, 3	1	2, 3	282	3.9 %
2	SE	S3SLNN	1	4, 5	1	1	3	0.0 %
2	SE	S3SSNN	1	1, 2, 3	1	1	195	2.7 %
2	SE	S4DLNN	1	4, 5	1	2, 3	22	0.3 %
2	SE	S4DSNN	1	1, 2, 3	1	2, 3	132	1.8 %
2	SE	S4SSNN	1	1, 2, 3	1	1	41	0.6 %
2	SE	S5DLNN	1	4, 5	1	2, 3	1	0.0 %
2	SE	S5DSNN	1	1, 2, 3	1	2, 3	7	0.1 %
2	SE	S5SSNN	1	1, 2, 3	1	1	5	0.1 %
2	SE	S6DLNN	1	4, 5	1	2, 3	32	0.4 %
2	SE	S6DSNN	1	1, 2, 3	1	2, 3	131	1.8 %
2	SE	S6SLNN	1	4, 5	1	1	2	0.0 %
2	SE	S6SSNN	1	1, 2, 3	1	1	15	0.2 %
3	SE	S3DSNY	1	1, 2, 3	2	2, 3	4	0.1 %
3	SE	S4DLNY	1	4, 5	2	2, 3	4	0.1 %
3	SE	S4DSNY	1	1, 2, 3	2	2, 3	39	0.5 %
3	SE	S5DLNY	1	4, 5	2	2, 3	3	0.0 %
3	SE	S5DSNY	1	1, 2, 3	2	2, 3	3	0.0 %
3	SE	S6SSYN	1	1, 2, 3	1, 3	1	77	1.1 %
4	SE	S3SSNY	1	1, 2, 3	2	1	3	0.0 %
4	SE	S3SSYY	1	1, 2, 3	2, 3	1	4	0.1 %
4	SE	S4SLNN	1	4, 5	1	1	2	0.0 %
4	SE	S4SLNY	1	4, 5	2	1	1	0.0 %
4	SE	S4SLYY	1	4, 5	2, 3	1	1	0.0 %
4	SE	S4SSNY	1	1, 2, 3	2	1	18	0.2 %
4	SE	S4SSYY	1	1, 2, 3	2, 3	1	24	0.3 %
4	SE	S5SLNY	1	4, 5	2	1	1	0.0 %
4	SE	S5SSNY	1	1, 2, 3	2	1	7	0.1 %
4	SE	S5SSYY	1	1, 2, 3	2, 3	1	1	0.0 %
4	SE	S6SLYY	1	4, 5	2, 3	1	1	0.0 %
4	SE	S6SSYY	1	1, 2, 3	2, 3	1	4	0.1 %
5	SE	S3DLYN	1	4, 5	1, 3	2, 3	32	0.4 %
5	SE	S3DSYN	1	1, 2, 3	1, 3	2, 3	442	6.1 %
5	SE	S3SLYN	1	4, 5	1, 3	1	3	0.0 %
5	SE	S3SSYN	1	1, 2, 3	1, 3	1	679	9.4 %
5	SE	S4DLYN	1	4, 5	1, 3	2, 3	31	0.4 %
5	SE	S4DSYN	1	1, 2, 3	1, 3	2, 3	168	2.3 %
5	SE	S4SSYN	1	1, 2, 3	1, 3	1	136	1.9 %

Broad Lake types revised	MS	National typology	Altitude	Area	Geology	Mean depth	WBs	% within MS
5	SE	S5DLYN	1	4, 5	1, 3	2, 3	1	0.0 %
5	SE	S5DSYN	1	1, 2, 3	1, 3	2, 3	5	0.1 %
5	SE	S5SLYN	1	4, 5	1, 3	1	2	0.0 %
5	SE	S5SSYN	1	1, 2, 3	1, 3	1	7	0.1 %
5	SE	S6DLYN	1	4, 5	1, 3	2, 3	10	0.1 %
5	SE	S6DSYN	1	1, 2, 3	1, 3	2, 3	150	2.1 %
5	SE	S6SLYN	1	4, 5	1, 3	1	3	0.0 %
6	SE	S4DLYY	1	4, 5	2, 3	2, 3	4	0.1 %
6	SE	S4DSYY	1	1, 2, 3	2, 3	2, 3	15	0.2 %
6	SE	S6DSYY	1	1, 2, 3	2, 3	2, 3	7	0.1 %
7	SE	S2DLNN	2	4, 5	1	2, 3	159	2.2 %
7	SE	S2DSNN	2	1, 2, 3	1	2, 3	1658	22.9 %
7	SE	S2SLNN	2	4, 5	1	1	3	0.0 %
7	SE	S2SSNN	2	1, 2, 3	1	1	615	8.5 %
7	SE	S7DLNN	2	4, 5	1	2, 3	4	0.1 %
7	SE	S7DSNN	2	1, 2, 3	1	2, 3	38	0.5 %
7	SE	S7SSNN	2	1, 2, 3	1	1	3	0.0 %
8	SE	S2DLNY	2	4, 5	2	2, 3	1	0.0 %
8	SE	S2DSNY	2	1, 2, 3	2	2, 3	33	0.5 %
8	SE	S2SSNY	2	1, 2, 3	2	1	35	0.5 %
9	SE	S2DLYN	2	4, 5	1, 3	2, 3	30	0.4 %
9	SE	S2DSYN	2	1, 2, 3	1, 3	2, 3	703	9.7 %
9	SE	S2SSYN	2	1, 2, 3	1, 3	1	572	7.9 %
9	SE	S7DLYN	2	4, 5	1, 3	2, 3	2	0.0 %
9	SE	S7DSYN	2	1, 2, 3	1, 3	2, 3	48	0.7 %
9	SE	S7SSYN	2	1, 2, 3	1, 3	1	24	0.3 %
10	SE	S2DSYY	2	1, 2, 3	2, 3	2, 3	13	0.2 %
10	SE	S2SSYY	2	1, 2, 3	2, 3	1	8	0.1 %
10	SE	S7DSYY	2	1, 2, 3	2, 3	2, 3	2	0.0 %
11	SE	S1DLNN	3	4, 5	1	2, 3	14	0.2 %
11	SE	S1DSNN	3	1, 2, 3	1	2, 3	405	5.6 %
11	SE	S1SSNN	3	1, 2, 3	1	1	52	0.7 %
12	SE	S1DSNY	3	1, 2, 3	2	2, 3	12	0.2 %
12	SE	S1SSNY	3	1, 2, 3	2	1	1	0.0 %
8	SI	A1	2	3	2	3	1	7.1 %
8	SI	A2	2	3	2	3	1	7.1 %
2	UK	11	1		1		4	0.4 %
2	UK	LAD			1	3	18	1.6 %
2	UK	LAS		3	1	2	179	16.0 %
2	UK	Lowland Low alkalinity Large Deep	1	4	1	3	76	6.8 %
2	UK	Lowland Medium alkalinity Large Deep	1	4	4	3	82	7.3 %
2	UK	MAD			4	3	5	0.4 %
2	UK	MAS			4	2	85	7.6 %
3	UK	HAS		3	2	2	166	14.8 %
3	UK	Lowland High alkalinity Large Deep	1	4	2	3	20	1.8 %
3	UK	MarlS				2	10	0.9 %
4	UK	5	1		2		14	1.3 %

Broad Lake types revised	MS	National typology	Altitude	Area	Geology	Mean depth	WBs	% within MS
4	UK	HAVS		2	2	1	212	18.9 %
4	UK	Lowland High alkalinity Large Shallow	1	4	2	1	19	1.7 %
4	UK	MarlVS				1	11	1.0 %
5	UK	12	1		3		2	0.2 %
5	UK	Lowland Peat Large Deep	1	4	3	3	11	1.0 %
5	UK	Lowland Peat Large Shallow	1	4	3	1	4	0.4 %
7	UK	Mid-altitude Low alkalinity Large Deep	2	4	1	3	61	5.5 %
7	UK	Mid-altitude Medium alkalinity Large Deep	2	4	4	3	31	2.8 %
8	UK	Mid-altitude High alkalinity Large Deep	2	4	2	3	4	0.4 %
9	UK	18	2		3		1	0.1 %
9	UK	Mid-altitude Peat Large Deep	2	4	3	3	1	0.1 %
10	UK	23	2		2,3		1	0.1 %

Annex 4 Ecological status and pressures in rivers and lakes for each country within each biogeographic region

Figure A4.1 Distribution of ecological status classes of classified <u>river</u> water bodies within each biogeographic region and country.

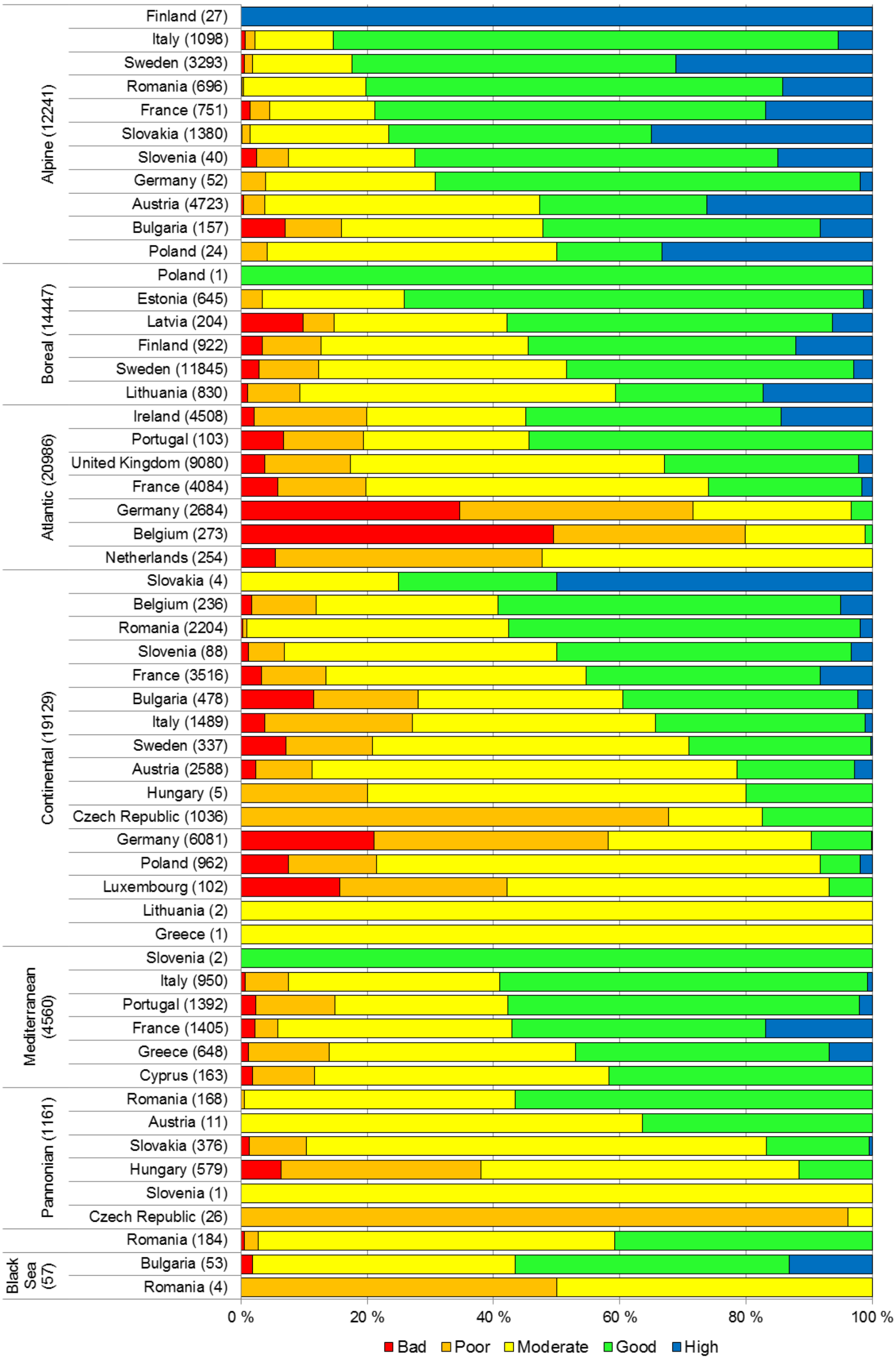


Figure A4.2 Distribution of ecological status classes of classified lake water bodies within each biogeographic region and country.

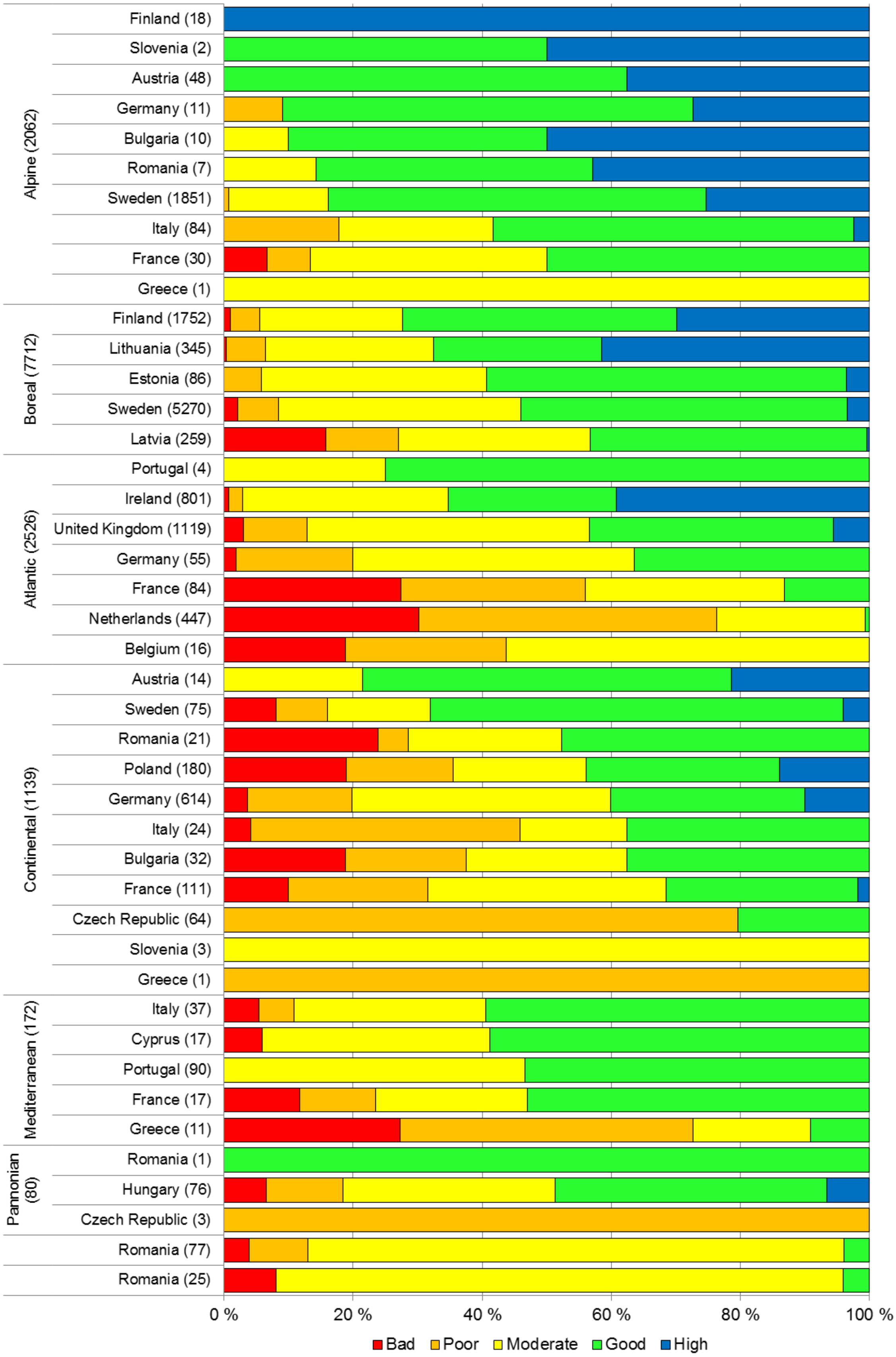


Figure A4.3 Proportion of water bodies with (red) and without (blue) pressures in classified river water bodies within each biogeographic region and country.

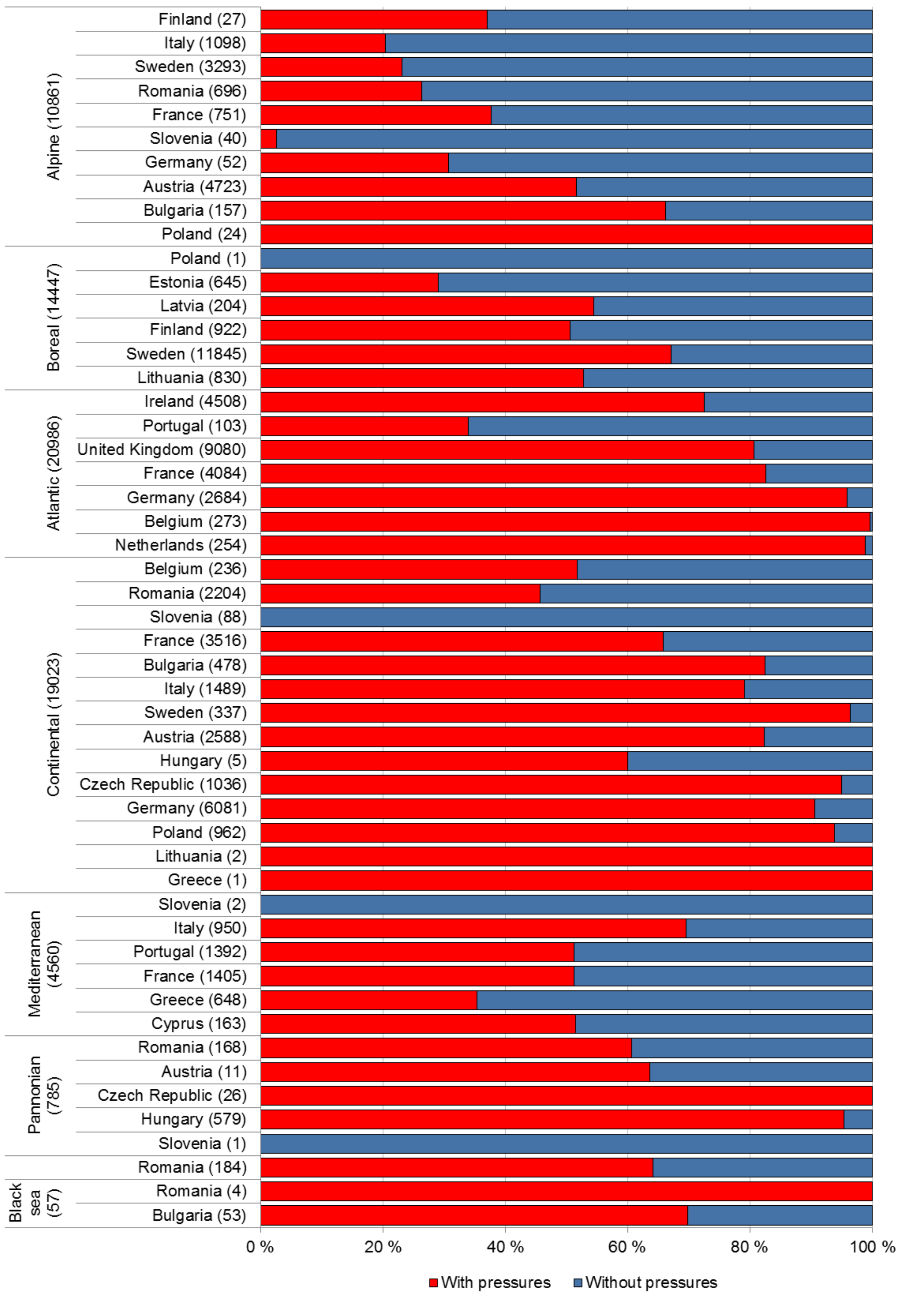


Figure A4.4 Proportion of water bodies with specific pressures in classified <u>river</u> water bodies within each biogeographic region and country.

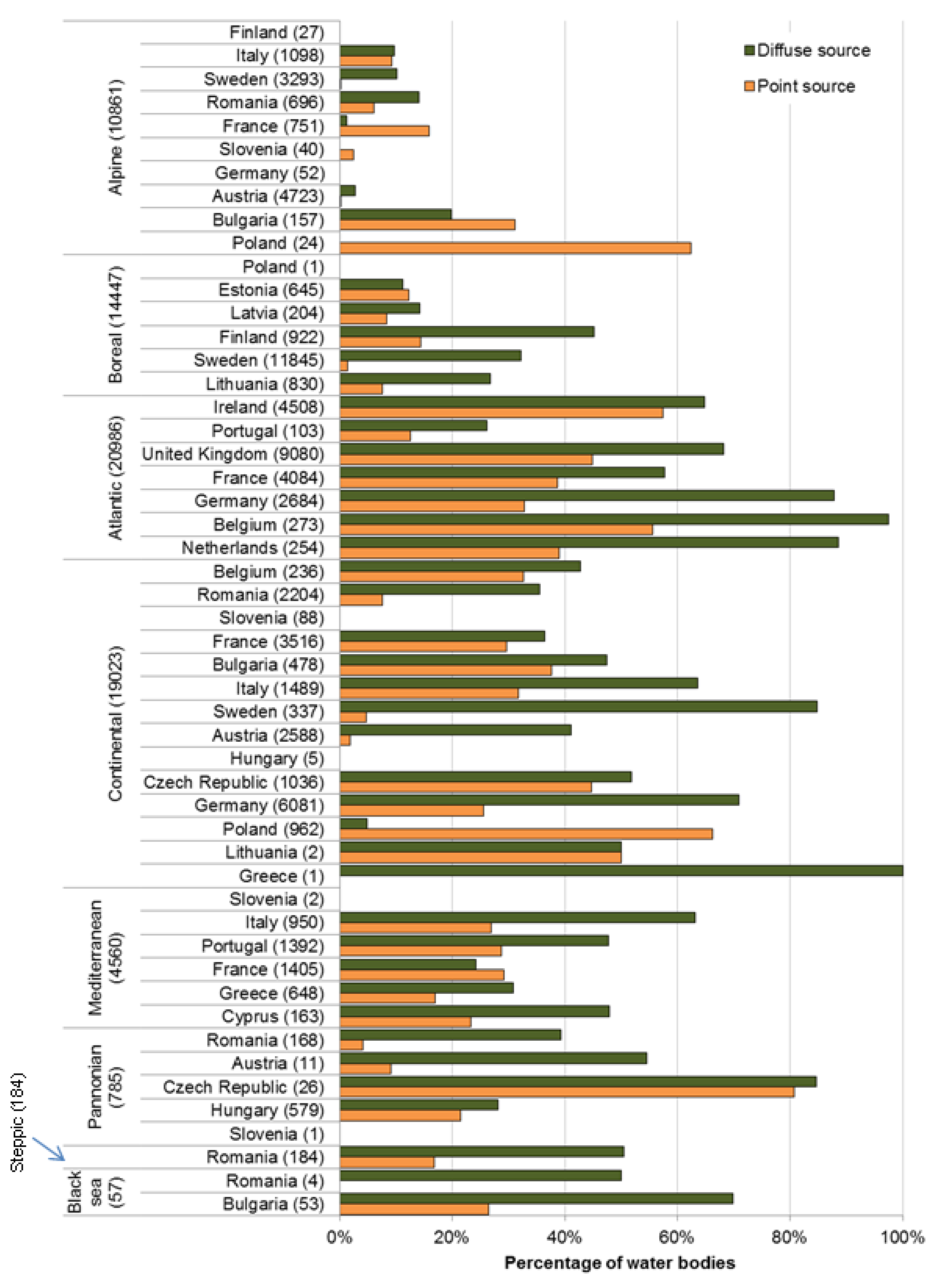


Figure A4.4 continued

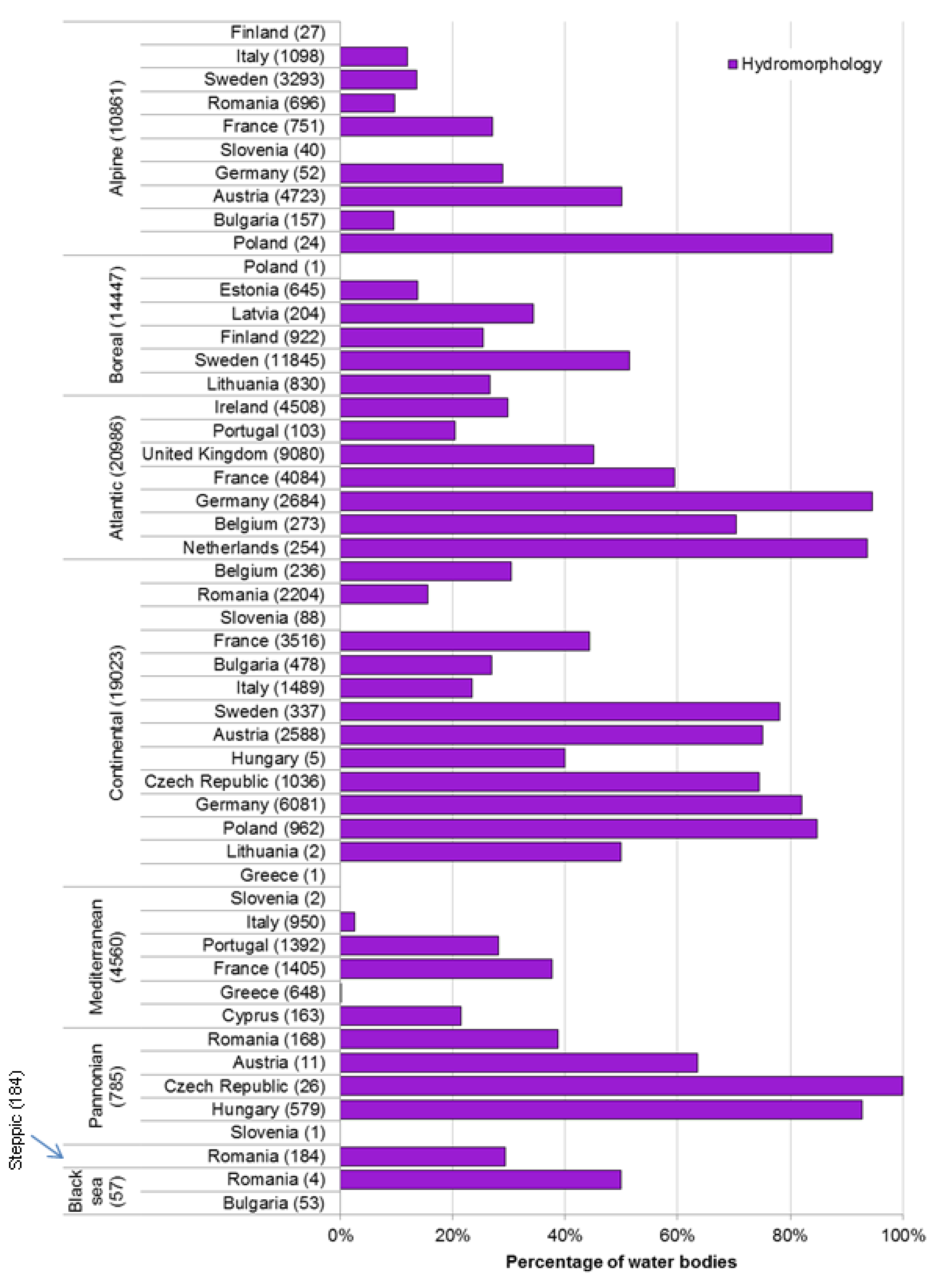


Figure A4.4 continued

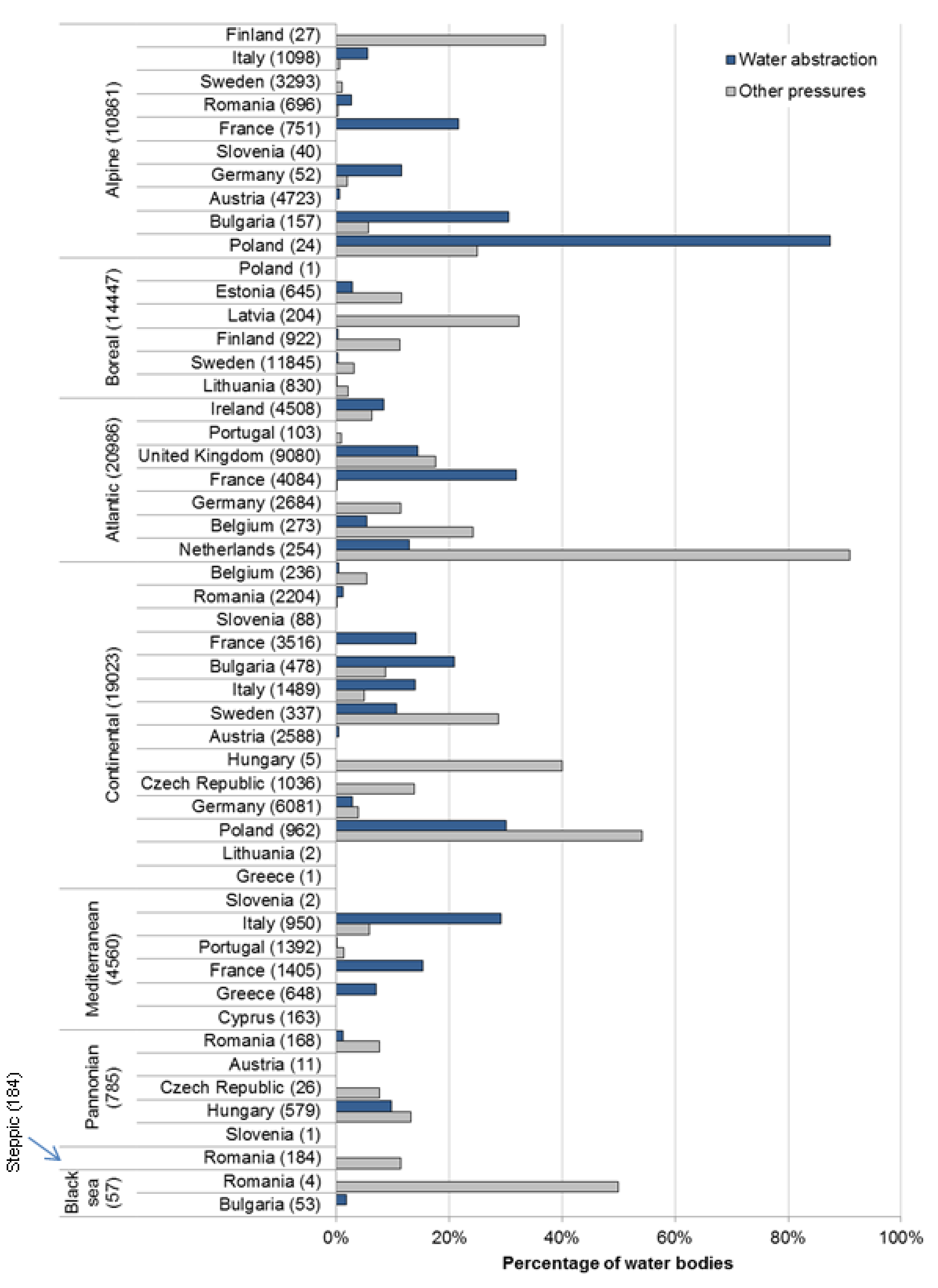


Figure A4.5. Proportion of water bodies with (red) and without (blue) pressures in classified lake water bodies within each biogeographic region and country.

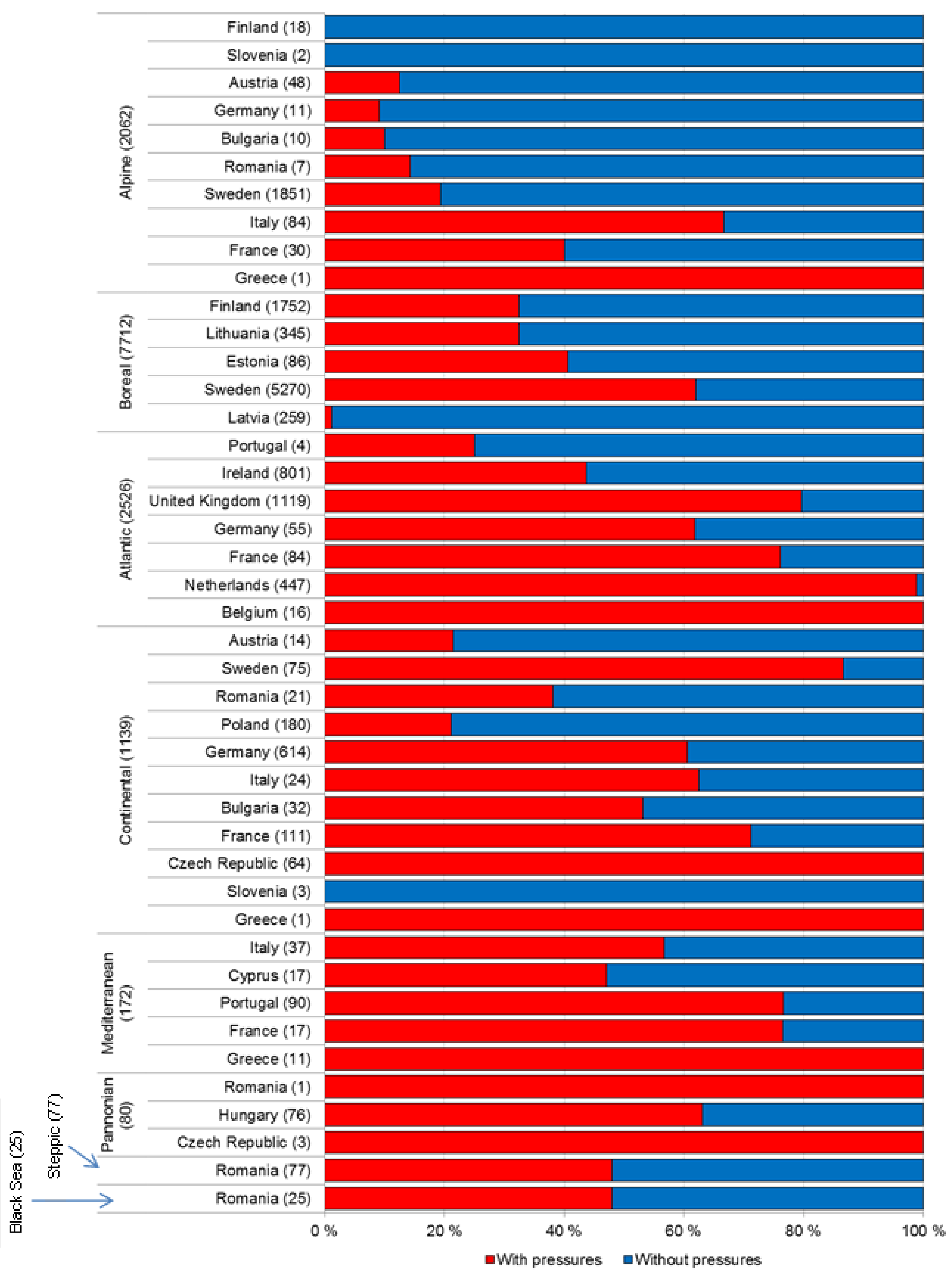


Figure A4.6 Proportion of water bodies with specific pressures in classified <u>lake</u> water bodies within each biogeographic region and country.

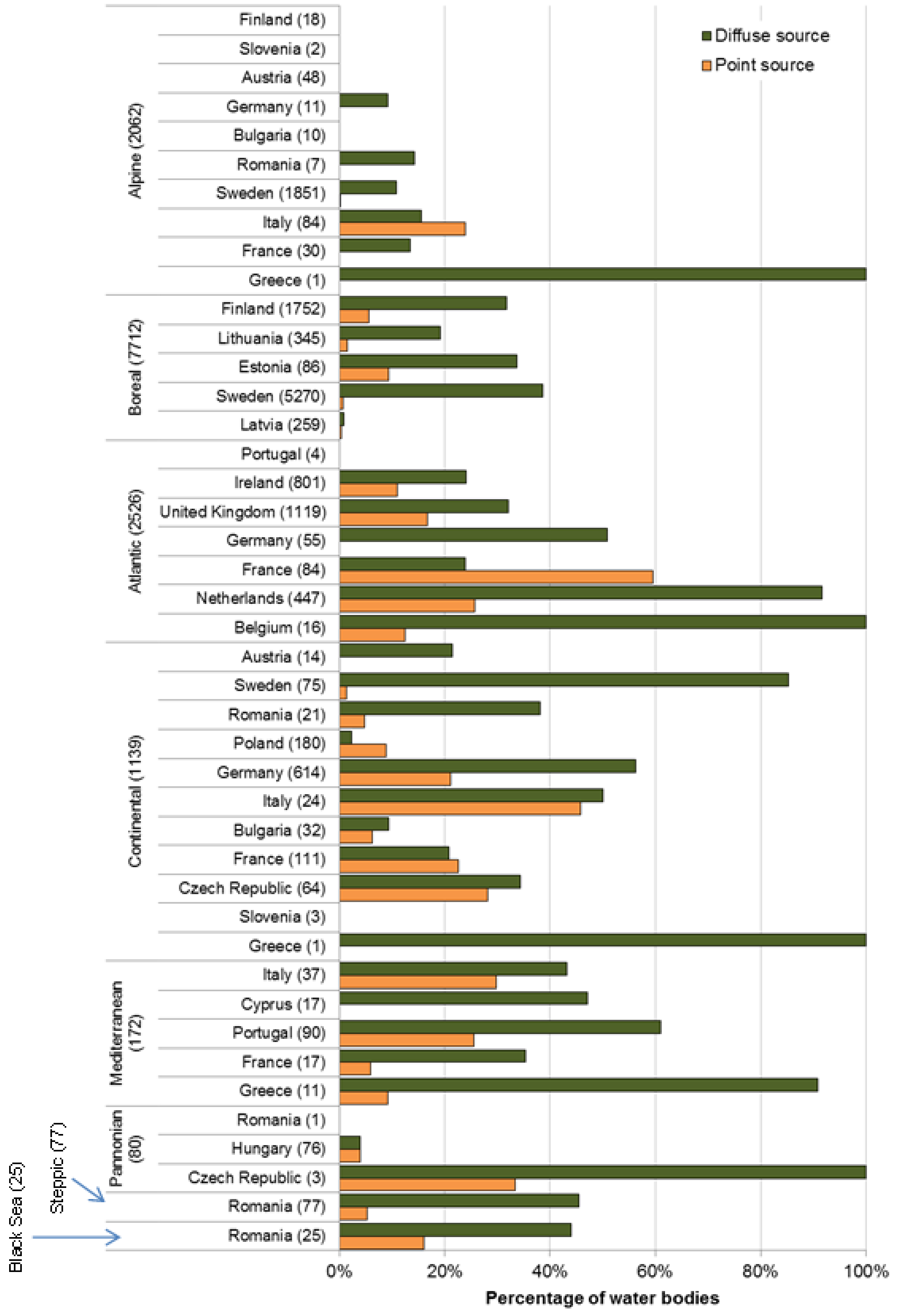


Figure A4.6 continued

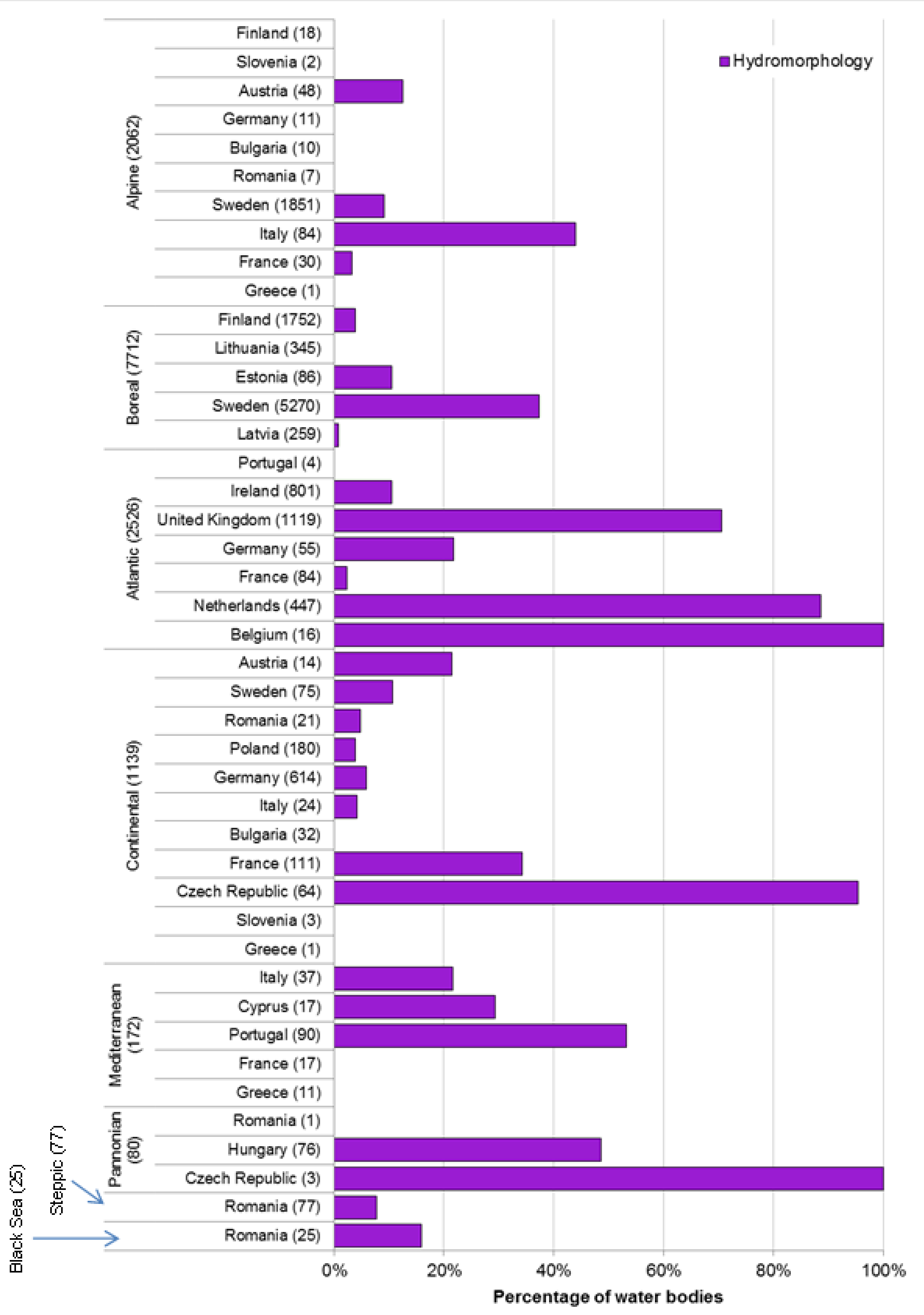
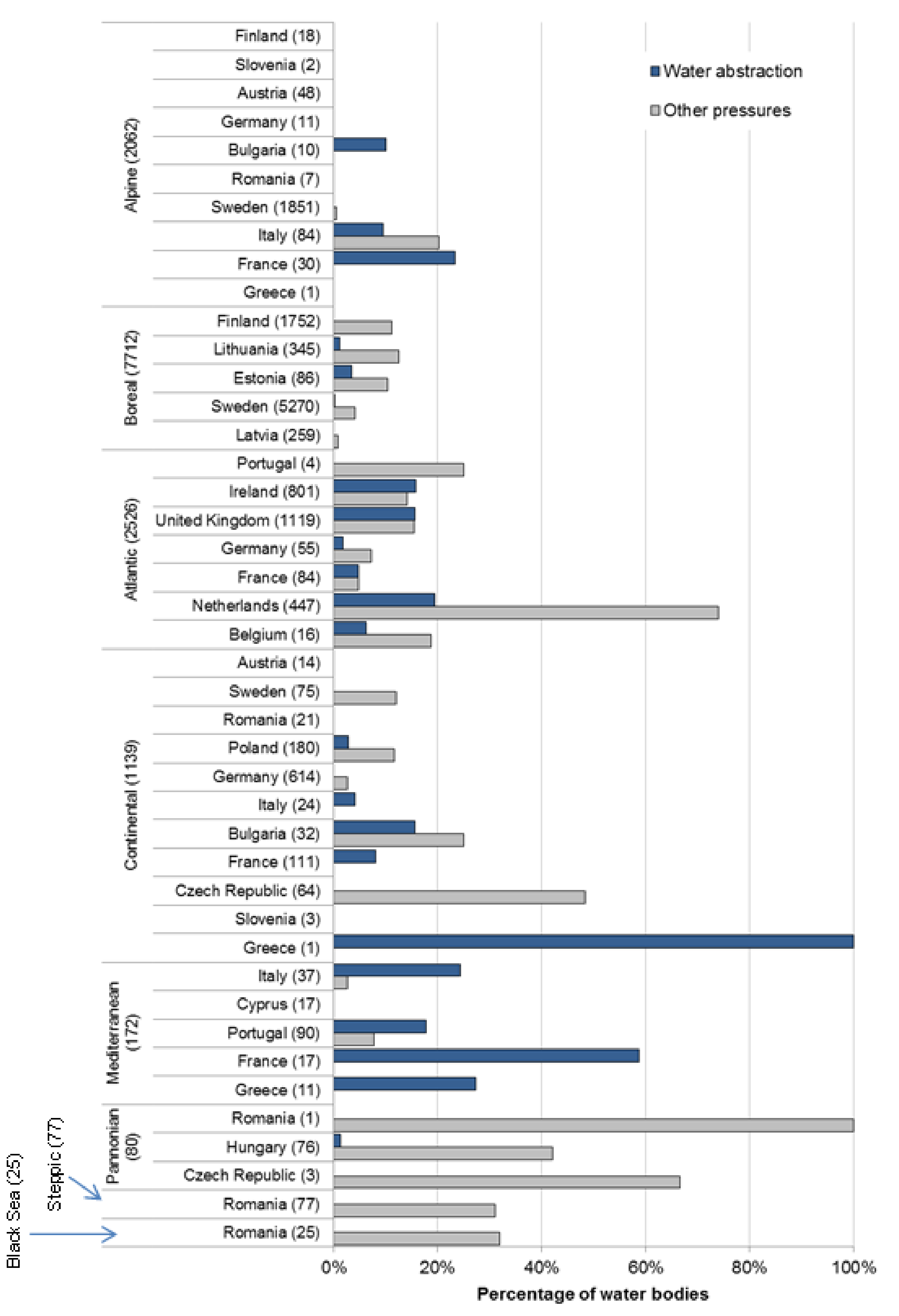


Figure A4.6 continued



Annex 5 Ecological status in rivers and lakes per broad type and country, for all WBs and for WBs associated with Natura2000 protected areas

Figure A5.1 Distribution of ecological status of all classified <u>river</u> water bodies reported with the 1st RBMP cycle in 2010, for each broad type and country (61062 in total).

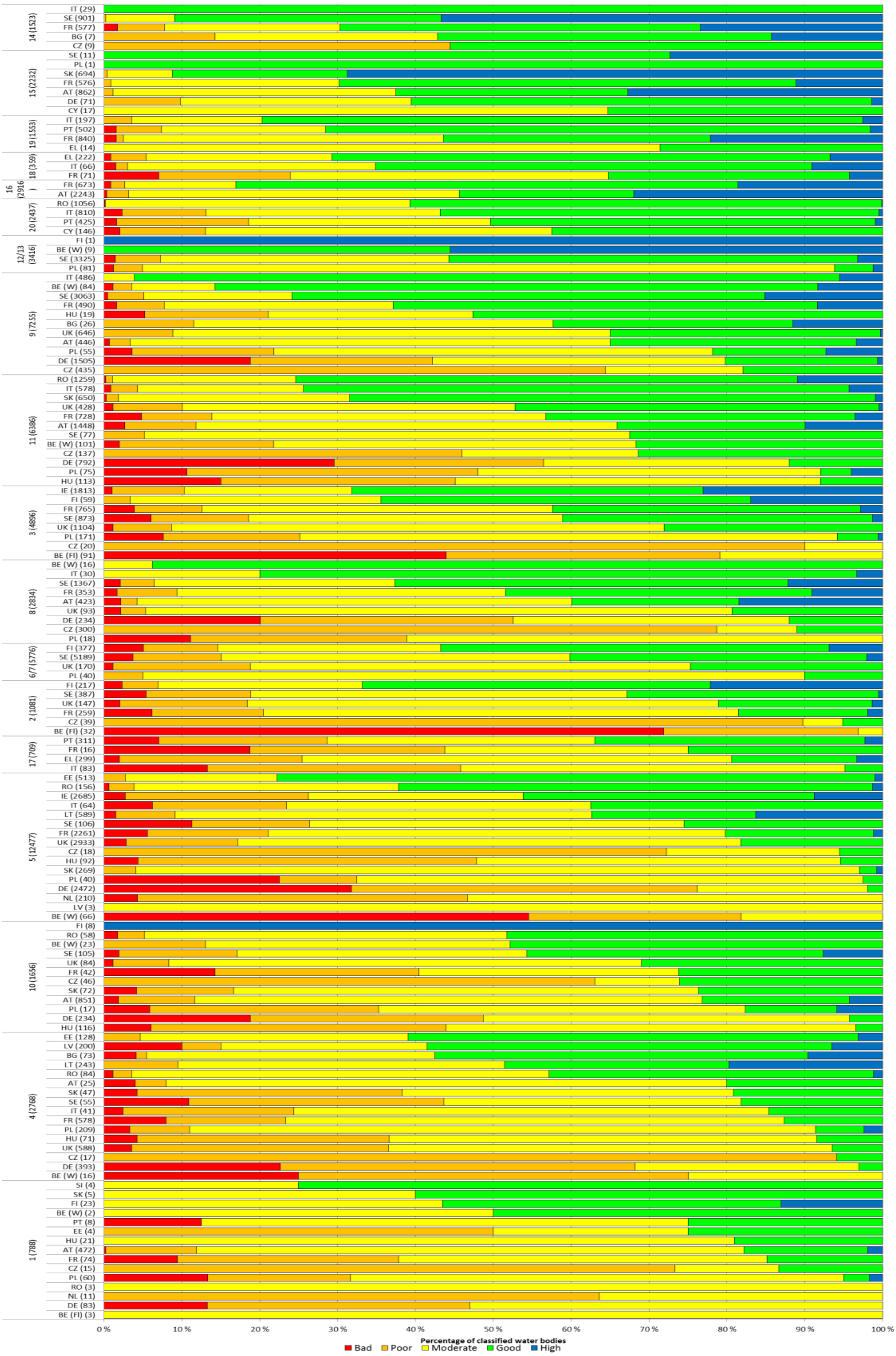


Figure A5.2 Distribution of ecological status of all classified river water bodies associated with (overlapping/partly within or completely within) Natura2000 protected areas per broad type and country (12647 in total).

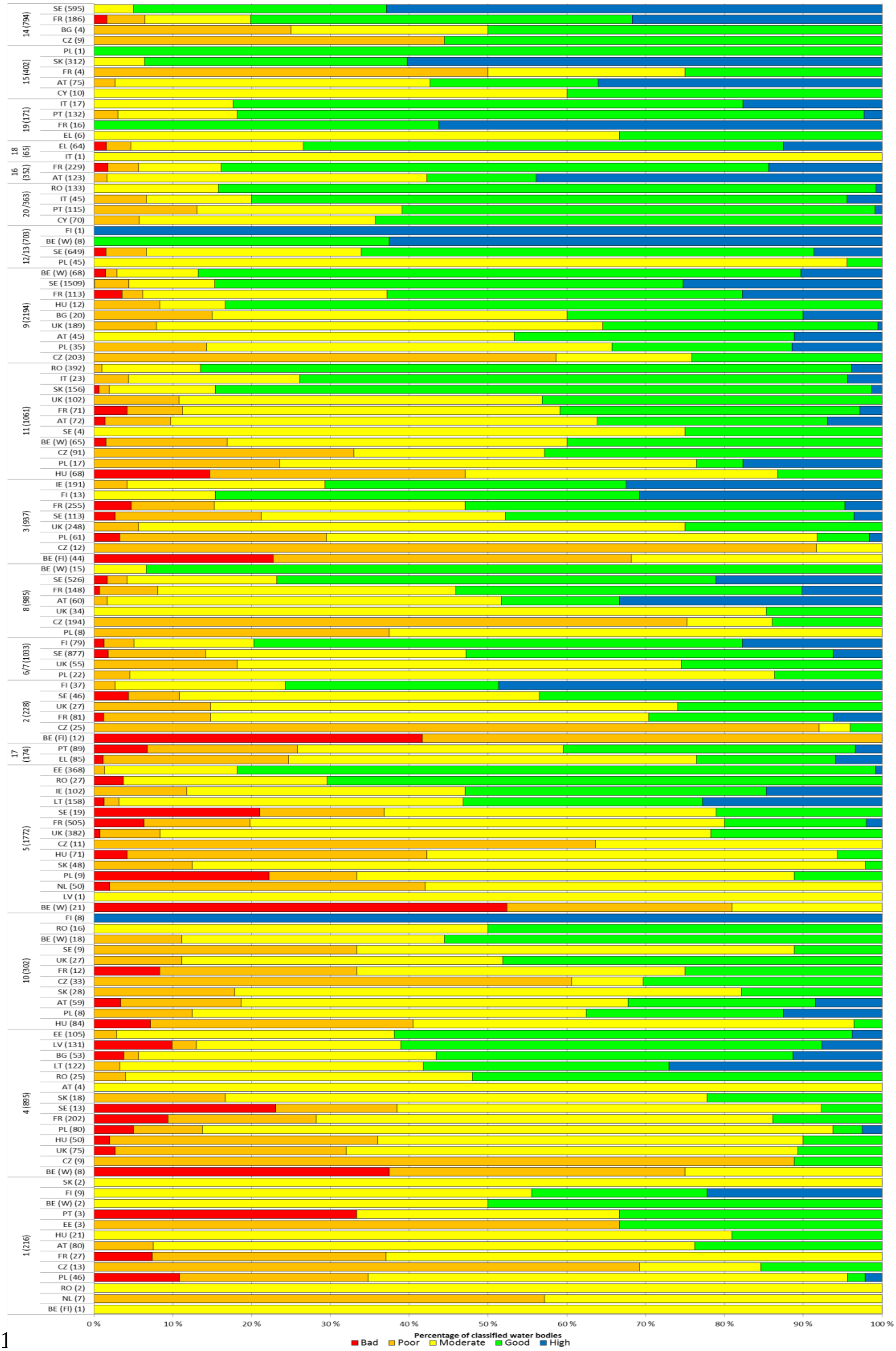


Figure A5.3 Distribution of ecological status of all classified lake water bodies reported with the 1st RBMP cycle in 2010, for each broad type and country (10973 in total).

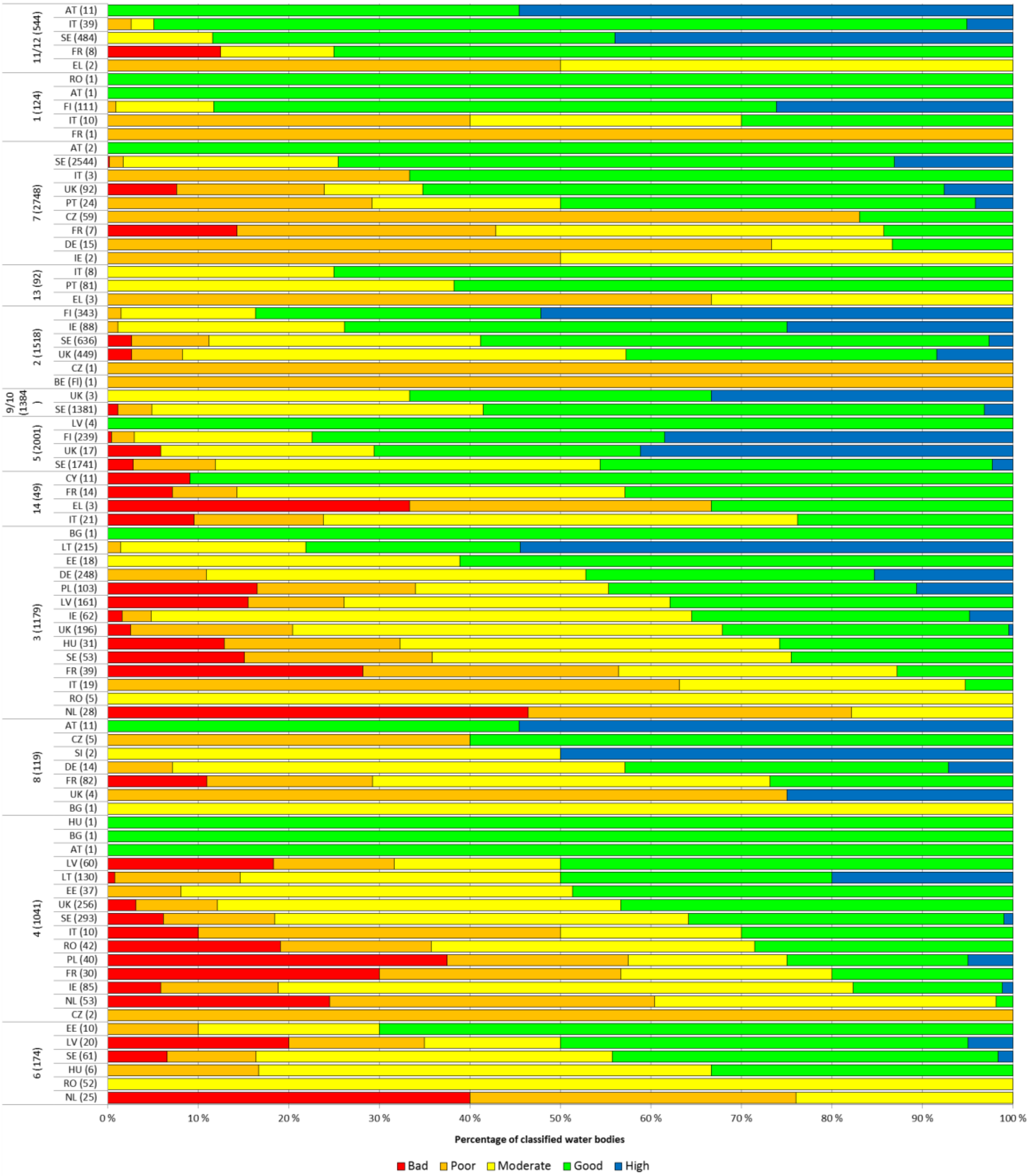
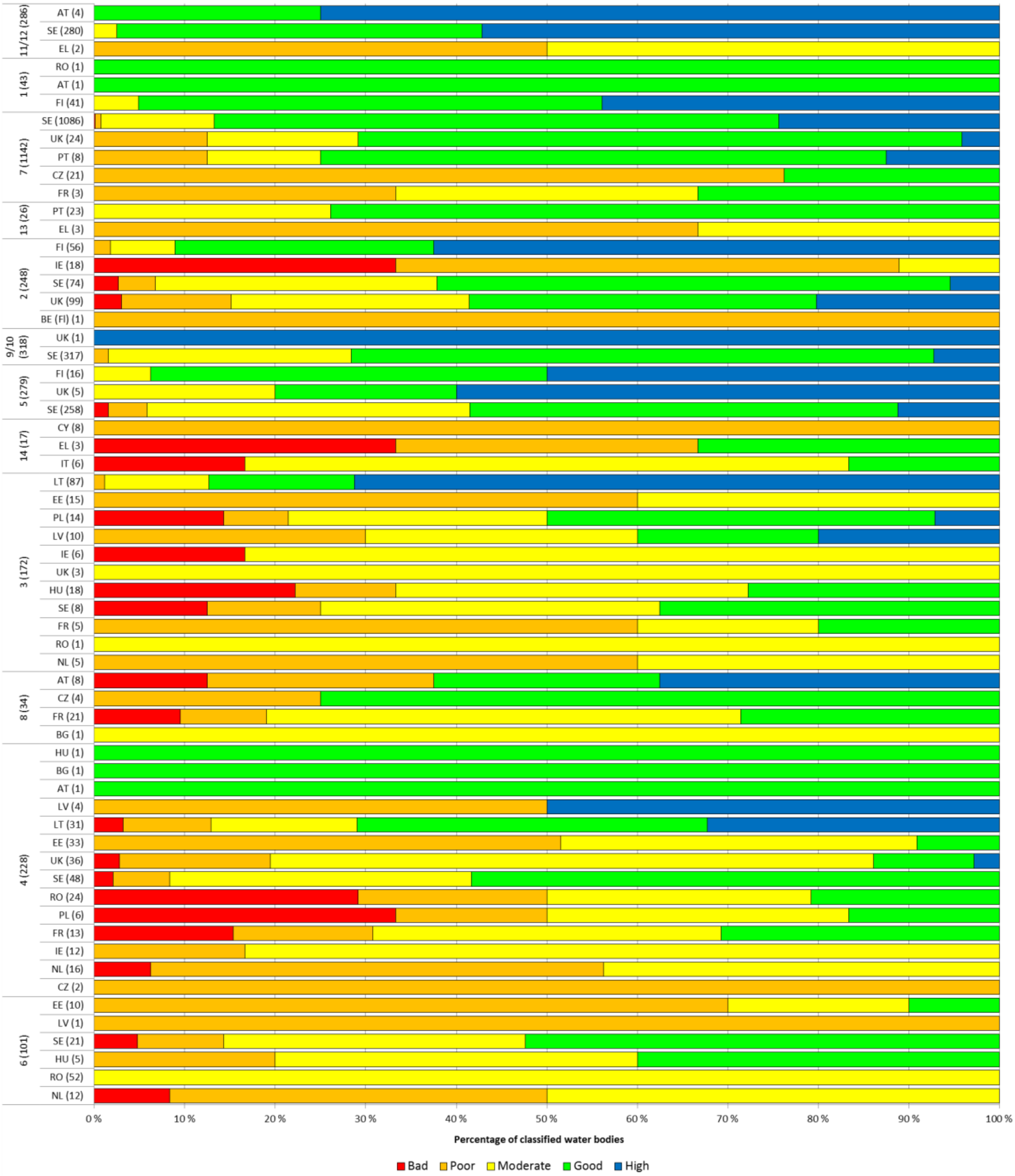


Figure A5.4 Distribution of ecological status of all classified lake water bodies associated with (overlapping/partly within or completely within) Natura2000 protected areas per broad type and country (2894 in total).



Annex 6 WFD-HD comparison of pressures

WFD WISE Pressures Reporting for Surface Water		Habitats Directive Pressures / Threats			
List of surface water pressures Level 1	**Level 2**	**Codes/Description Level 1**	**Level 2**	**Level 3**	
1 Point Source	1_1 Point - UWWT_General	E Urbanisation, residential and commercial development	E03 Discharges	E03.01	disposal of household / recreational facility waste
		E Urbanisation, residential and commercial development	E03 Discharges	E03.02	disposal of industrial waste
		E Urbanisation, residential and commercial development	E03 Discharges	E03.03	disposal of inert materials
1 Point Source	1_2 Point - Storm Overflows	H Pollution	H01 Pollution to surface waters (limnic, terrestrial, marine & brackish)	H01.02	pollution to surface waters by storm overflows
1 Point Source	1_3 Point - IPPC plants (EPRTR)	H Pollution	H01 Pollution to surface waters (limnic, terrestrial, marine & brackish)	H01.01	pollution to surface waters by industrial plants
1 Point Source	1_4 Point - Non IPPC				
1 Point Source	1_5 Point - Other	H Pollution	H01 Pollution to surface waters (limnic, terrestrial, marine & brackish)	H01.03	other point source pollution to surface water
2 Diffuse Source	2_1 Diffuse - Urban run off	H Pollution	H01 Pollution to surface waters (limnic, terrestrial, marine & brackish)	H01.04	diffuse pollution to surface waters via storm overlows or urban run-off
2 Diffuse Source	2_2 Diffuse - Agricultural	H Pollution	H01 Pollution to surface waters (limnic, terrestrial, marine & brackish)	H01.05	diffuse pollution to surface waters due to agricultural and forestry activities
2 Diffuse Source	2_3 Diffuse - Transport and infrastructure	H Pollution	H01 Pollution to surface waters (limnic, terrestrial, marine & brackish)	H01.06	diffuse pollution to surface waters due to transport and infrastructure without connection to canalization/sweepers
2 Diffuse Source	2_4 Diffuse - Abandoned industrial sites	H Pollution	H01 Pollution to surface waters (limnic, terrestrial, marine & brackish)	H01.07	diffuse pollution to surface waters due to abandoned industrial sites

WFD WISE Pressures Reporting for Surface Water		Habitats Directive Pressures / Threats			
List of surface water pressures Level 1	**Level 2**	**Codes/Description Level 1**	**Level 2**	**Level 3**	
2 Diffuse Source	2_5 Diffuse - Releases from facilities not connected to sewerage	H Pollution	H01 Pollution to surface waters (limnic, terrestrial, marine & brackish)	H01.08	diffuse pollution to surface waters due to household sewage and waste waters
2 Diffuse Source	2_6 Diffuse - Other	H Pollution	H01 Pollution to surface waters (limnic, terrestrial, marine & brackish)	H01.09	diffuse pollution to surface waters due to other sources not listed
		H Pollution	H04 Air pollution, air-borne pollutants	H04.01	Acid rain
		H Pollution	H06 excess energy	H06.03	Thermal heating of water bodies
3 Water Abstraction	3_1 Abstraction - Agriculture	J Natural System Modifications	J02.06 Water abstractions from surface waters	J02.06.01	surface water abstractions for agriculture
3 Water Abstraction	3_2 Abstraction - Public Water Supply	J Natural System Modifications	J02.06 Water abstractions from surface waters	J02.06.02	surface water abstractions for public water supply
3 Water Abstraction	3_3 Abstraction - Manufacturing	J Natural System Modifications	J02.06 Water abstractions from surface waters	J02.06.03	surface water abstractions by manufacturing industry
3 Water Abstraction	3_4 Abstraction - Electricity cooling	J Natural System Modifications	J02.06 Water abstractions from surface waters	J02.06.04	surface water abstractions for the production of electricity (cooling)
3 Water Abstraction	3_5 Abstraction - Fish farms	J Natural System Modifications	J02.06 Water abstractions from surface waters	J02.06.05	surface water abstractions by fish farms
3 Water Abstraction	3_6 Abstraction - Hydro-energy not cooling	J Natural System Modifications	J02.06 Water abstractions from surface waters	J02.06.06	surface water abstractions by hydro-energy
3 Water Abstraction	3_7 Abstraction - Quarries	J Natural System Modifications	J02.06 Water abstractions from surface waters	J02.06.07	surface water abstractions by quarries/ open cast (coal) sites
3 Water Abstraction	3_9 Abstraction - Water transfer	J Natural System Modifications	J02.06 Water abstractions from surface waters	J02.06.09	surface water abstractions for water transfer

WFD WISE Pressures Reporting for Surface Water		Habitats Directive Pressures / Threats			
List of surface water pressures Level 1	**Level 2**	**Codes/Description Level 1**	**Level 2**	**Level 3**	
			J02.06 Water abstractions from surface waters	J02.06.08	surface water abstractions for navigation
3 Water Abstraction	3_10 Abstraction - Other	J Natural System Modifications	J02.06 Water abstractions from surface waters	J02.06.10	other major surface water abstractions
4 Water flow regulations and morphological alterations of surface waters	4_2 FlowMorph - Hydroelectric dam	J Natural System Modifications	J02.05 Modification of hydrographic functioning, general	J02.05.05	small hydropower projects, weirs
4 Water flow regulations and morphological alterations of surface waters	4_3 FlowMorph - Water supply reservoir	J Natural System Modifications	J02.05 Modification of hydrographic functioning, general	J02.05.04	reservoirs
4 Water flow regulations and morphological alterations of surface waters	4_4 FlowMorph - Flood defence dams	J Natural System Modifications	J02.04 Flooding modifications	J02.04.01	flooding
		J Natural System Modifications	J02.04 Flooding modifications	J02.04.02	lack of flooding
		J Natural System Modifications	J02.12 Dykes, embankments, artificial beaches, general	J02.12.02	dykes and flooding defense in inland water systems
4 Water flow regulations and morphological alterations of surface waters	4_5 FlowMorph - Water Flow Regulation	J Natural System Modifications	J02.05 Modification of hydrographic functioning, general	J02.05.01	modification of water flow (tidal & marine currents)

WFD WISE Pressures Reporting for Surface Water		Habitats Directive Pressures / Threats			
List of surface water pressures Level 1	**Level 2**	**Codes/Description Level 1**	**Level 2**	**Level 3**	
			J02.05 Modification of hydrographic functioning, general	J02.05.02	modifying structures of inland water courses
			J02.05 Modification of hydrographic functioning, general	J02.05.03	modification of standing water bodies
4 Water flow regulations and morphological alterations of surface waters	4_6 FlowMorph - Diversions	J Natural System Modifications	J02.03 Canalisation & water deviation	J02.03.01	large scale water deviation
4 Water flow regulations and morphological alterations of surface waters	4_7 FlowMorph - Locks		J02.05 Modification of hydrographic functioning, general	J02.05.06	wave exposure changes
4 Water flow regulations and morphological alterations of surface waters	4_8 FlowMorph - Weirs	J Natural System Modifications	J02.05 Modification of hydrographic functioning, general	J02.05.05	small hydropower projects, weirs
5 River management	5_1 RiverManagement - Physical alteration of channel	J Natural System Modifications	J02.05 Modification of hydrographic functioning, general	J02.05.02	modifying structures of inland water courses
		J Natural System Modifications	J03 Other ecosystem modifications	J03.01	reduction or loss of specific habitat features
		J Natural System Modifications	J02.02 Removal of sediments (mud…)	J02.02.01	dredging/ removal of limnic sediments
		J Natural System Modifications	J02.03 Canalisation & water deviation	J02.03.02	canalisation

WFD WISE Pressures Reporting for Surface Water		Habitats Directive Pressures / Threats			
List of surface water pressures Level 1	**Level 2**	**Codes/Description Level 1**	**Level 2**	**Level 3**	
5 River management	5_2 RiverManagement - Engineering activities	J Natural System Modifications	J02.05 Modification of hydrographic functioning, general	J02.05.02	modifying structures of inland water courses
		J Natural System Modifications	J02.03 Canalisation & water deviation	J02.03.02	canalisation
5 River management	5_3 RiverManagement - Agricultural enhancement	J Natural System Modifications	J02 human induced changes in hydraulic conditions	J02.10	management of aquatic and bank vegetation for drainage purposes
		J Natural System Modifications	J02.11 Siltation rate changes, dumping, depositing of dredged deposits	J02.11.01	Dumping, depositing of dredged deposits
		J Natural System Modifications	J02.11 Siltation rate changes, dumping, depositing of dredged deposits	J02.11.02	Other siltation rate changes
5 River management	5_5 RiverManagement - Land infrastructure	D Transportation and service corridors	D01 Roads, paths and railroads	D01.01	paths, tracks, cycling tracks
			D01 Roads, paths and railroads	D01.02	roads, motorways
			D01 Roads, paths and railroads	D01.03	car parks and parking areas
			D01 Roads, paths and railroads	D01.04	railway lines, TGV
			D01 Roads, paths and railroads	D01.05	bridge, viaduct
			D01 Roads, paths and railroads	D01.06	tunnel
6 Transitional and coastal water management	6_1 TRACManagement - Estuarine/coastal dredging	J Natural System Modifications	J02.02 Removal of sediments (mud…)	J02.02.02	estuarine and coastal dredging

WFD WISE Pressures Reporting for Surface Water		Habitats Directive Pressures / Threats			
List of surface water pressures Level 1	**Level 2**	**Codes/Description Level 1**	**Level 2**	**Level 3**	
6 Transitional and coastal water management	6_2 TRACManagement - Marine constructions	D Transportation and service corridors	D03.01 port areas	D03.01.01	slipways
		D Transportation and service corridors	D03.01 port areas	D03.01.02	piers / tourist harbours or recreational piers
		D Transportation and service corridors	D03.01 port areas	D03.01.03	fishing harbours
		D Transportation and service corridors	D03.01 port areas	D03.01.04	industrial ports
		D Transportation and service corridors	D03.02 Shipping lanes	D03.02.01	cargo lanes
		D Transportation and service corridors	D03.02 Shipping lanes	D03.02.02	passenger ferry lanes (high speed)
6 Transitional and coastal water management	6_3 TRACManagement - Land reclamation	J Natural System Modifications	J02.01 Landfill, land reclamation and drying out, general	J02.01.02	reclamation of land from sea, estuary or marsh
7 Other morphological alterations	7_1 OtherMorph - Barriers	J Natural System Modifications	J03.02 anthropogenic reduction of habitat connectivity	J03.02.01	reduction in migration/ migration barriers
		J Natural System Modifications	J03.02 anthropogenic reduction of habitat connectivity	J03.02.02	reduction in dispersal
		J Natural System Modifications	J03 Other ecosystem modifications	J03.03	reduction, lack or prevention of erosion
		J Natural System Modifications	J02 human induced changes in hydraulic conditions	J02.15	Other human induced changes in hydraulic conditions
8 Other Pressures	8_1 OtherPressures - Litter/fly tipping	H Pollution	H05 Soil pollution and solid waste (excluding discharges)	H05.01	garbadge and solid waste

WFD WISE Pressures Reporting for Surface Water		Habitats Directive Pressures / Threats			
List of surface water pressures Level 1	**Level 2**	**Codes/Description Level 1**	**Level 2**	**Level 3**	
8 Other Pressures	8_4 OtherPressures - Recreation	G Human intrusions and disturbances	G01 'Outdoor sports and leisure activities, recreational activities		
8 Other Pressures	8_5 OtherPressures - Fishing	F Biological resource use other than agriculture & forestry	F01 Marine and Freshwater Aquaculture	F01.01	intensive fish farming, intensification
		F Biological resource use other than agriculture & forestry	F01 Marine and Freshwater Aquaculture	F01.02	suspension culture
		F Biological resource use other than agriculture & forestry	F02 Fishing and harvesting aquatic resources	F02.01	Professional passive fishing
		F Biological resource use other than agriculture & forestry	F02 Fishing and harvesting aquatic resources	F02.02	Professional active fishing
		F Biological resource use other than agriculture & forestry	F02 Fishing and harvesting aquatic resources	F02.03	Leisure fishing
8 Other Pressures	8_6 OtherPressures - Introduced species	I Invasive, other problematic species and genes		I01	invasive non-native species
		I Invasive, other problematic species and genes		I02	problematic native species
		I Invasive, other problematic species and genes	I03 introduced genetic material, GMO	I03.01	genetic pollution (animals)
8 Other Pressures	8_7 OtherPressures - Introduced disease	K Natural biotic and abiotic processes (without catastrophes)	K03 'Interspecific faunal relations	K03.03 'introduction of disease (microbial pathogens)	
8 Other Pressures	8_8 OtherPressures - Climate change	M Climate change	M01 Changes in abiotic conditions	M01.01	temperature changes (e.g. rise of temperature & extremes)
		M Climate change	M01 Changes in abiotic conditions	M01.02	droughts and less precipitations
		M Climate change	M01 Changes in abiotic conditions	M01.03	flooding and rising precipitations
		M Climate change	M01 Changes in abiotic conditions	M01.04	pH-changes

WFD WISE Pressures Reporting for Surface Water		Habitats Directive Pressures / Threats			
List of surface water pressures Level 1	**Level 2**	**Codes/Description Level 1**	**Level 2**	**Level 3**	
		M Climate change	M01 Changes in abiotic conditions	M01.05	water flow changes (limnic, tidal and oceanic)
		M Climate change	M02 Changes in biotic conditions	M02.01	habitat shifting and alteration
		M Climate change	M02 Changes in biotic conditions	M02.02	desynchronisation of processes
		M Climate change	M02 Changes in biotic conditions	M02.03	decline or extinction of species
		M Climate change	M02 Changes in biotic conditions	M02.04	migration of species (natural newcomers)
8 Other Pressures	8_9 OtherPressures - Land drainage	J Natural System Modifications	J02.01 Landfill, land reclamation and drying out, general	J02.01.01	polderisation
		J Natural System Modifications	J02.01 Landfill, land reclamation and drying out, general	J02.01.03	infilling of ditches, dykes, ponds, pools, marshes or pits
		J Natural System Modifications	J02.01 Landfill, land reclamation and drying out, general	J02.01.04	recultivation of mining areas
8 Other Pressures	8_10 OtherPressures-Other	C Mining, extraction of materials and energy production	C01.03 Peat extraction	C01.03.01	hand cutting of peat
		C Mining, extraction of materials and energy production	C01.03 Peat extraction	C01.03.02	mechanical removal of peat
		J Natural System Modifications	J02 human induced changes in hydraulic conditions	J02.15	Abandonment of management of water bodies

Annex 7 National WFD national types sorted into broad altitude types and size for Germany, Ireland, Sweden and Hungary

Table A7.1. Germany

Country	Water Category Code	Broad Altitude Type	Size	TYPE_CODE	TYPE_NAME
DE	RW	Lowland	Rivers	15_G	Große sand- und lehmgeprägte Tieflandflüsse
DE	RW	Mid-altitude	Rivers	4	Große Flüsse des Alpenvorlandes
DE	RW	Mid-altitude	Rivers	9.2	Große Flüsse des Mittelgebirges
DE	RW	Mid-altitude	N/A	2	Fließgewässer des Alpenvorlandes
DE	RW	Lowland	N/A	22	Marschengewässer
DE	RW	Lowland	N/A	22.1	Gewässer der Marschen
DE	RW	Mid-altitude	N/A	3	Fließgewässer der Jungmoräne des Alpenvorlandes
DE	RW	N/A	Rivers	12	Organisch geprägte Flüsse
DE	RW	Lowland	Rivers	15	Sand- und lehmgeprägte Tieflandflüsse
DE	RW	Mid-altitude	Rivers	2.2	Kleine Flüsse des Alpenvorlandes
DE	RW	N/A	Rivers	21	Seeausflussgeprägte Fließgewässer
DE	RW	Mid-altitude	Rivers	21_S	Seeausflussgeprägte Fließgewässer des Alpenvorlandes (Süd)
DE	RW	Lowland	Rivers	22.2	Flüsse der Marschen
DE	RW	Lowland	Rivers	23	Rückstau- bzw. brackwasserbeeinflusste Ostseezuflüsse
DE	RW	Mid-altitude	Rivers	3.2	Kleine Flüsse der Jungmoräne des Alpenvorlandes
DE	RW	Mid-altitude	Rivers	9	Silikatische, fein- bis grobmaterialreiche Mittelgebirgsflüsse
DE	RW	Mid-altitude	Rivers	9.1	Karbonatische, fein- bis grobmaterialreiche Mittelgebirgsflüsse
DE	RW	Mid-altitude	Rivers	9.1_K	Karbonatische, fein- bis grobmaterialreiche Mittelgebirgsflüsse des Keupers
DE	RW	Alpine	Streams	1.1	Bäche der Kalkalpen
DE	RW	Alpine	Streams	1.2	Kleine Flüsse der Kalkalpen
DE	RW	N/A	Streams	11	Organisch geprägte Bäche

Country	Water Category Code	Broad Altitude Type	Size	TYPE_CODE	TYPE_NAME
DE	RW	Lowland	Streams	14	Sandgeprägte Tieflandbäche
DE	RW	Lowland	Streams	16	Kiesgeprägte Tieflandbäche
DE	RW	Lowland	Streams	17	Kiesgeprägte Tieflandflüsse
DE	RW	Lowland	Streams	18	Löss-lehmgeprägte Tieflandbäche
DE	RW	N/A	Streams	19	Kleine Niederungsfließgewässer in Fluss- und Stromtälern
DE	RW	Mid-altitude	Streams	2.1	Bäche des Alpenvorlandes
DE	RW	Mid-altitude	Streams	3.1	Bäche der Jungmoräne des Alpenvorlandes
DE	RW	Mid-altitude	Streams	5	Grobmaterialreiche, silikatische Mittelgebirgsbäche
DE	RW	Mid-altitude	Streams	5.1	Feinmaterialreiche, silikatische Mittelgebirgsbäche
DE	RW	Mid-altitude	Streams	6	Feinmaterialreiche, karbonatische Mittelgebirgsbäche
DE	RW	Mid-altitude	Streams	6_K	Feinmaterialreiche, karbonatische Mittelgebirgsbäche des Keupers
DE	RW	Mid-altitude	Streams	7	Grobmaterialreiche, karbonatische Mittelgebirgsbäche
DE	RW	Mid-altitude	Very large	10	Kiesgeprägte Ströme
DE	RW	Lowland	Very large	20	Sandgeprägte Ströme
DE	RW	Lowland	Very large	22.3	Ströme der Marschen
DE	RW	N/A	N/A	99	
DE	RW	N/A	N/A	Null	Keine Information verfügbar
DE	LW	Alpine	N/A	1	Kalkreicher*, ungeschichteter Voralpensee mit relativ großem Einzugsgebiet**
DE	LW	Lowland	N/A	10	Kalkreicher, geschichteter Flachlandsee mit relativ großem Einzugsgebiet
DE	LW	Lowland	N/A	11	Kalkreicher, ungeschichteter Flachlandsee mit relativ großem Einzugsgebiet und einer Verweilzeit >30d
DE	LW	Lowland	N/A	12	Kalkreicher, ungeschichteter Flachlandsee mit relativ großem Einzugsgebiet und einer Verweilzeit > 3d und < 30d
DE	LW	Lowland	N/A	13	Kalkreicher, geschichteter Flachlandsee mit relativ kleinem Einzugsgebiet
DE	LW	Lowland	N/A	14	Kalkreicher, ungeschichteter Flachlandsee mit relativ kleinem Einzugsgebiet
DE	LW	Alpine	N/A	2	Kalkreicher, geschichteter*** Voralpensee mit relativ großem Einzugsgebiet
DE	LW	Alpine	N/A	3	Kalkreicher, geschichteter Voralpensee mit relativ kleinem Einzugsgebiet

Country	Water Category Code	Broad Altitude Type	Size	TYPE_CODE	TYPE_NAME
DE	LW	Alpine	N/A	4	Kalkreicher, geschichteter Alpensee mit relativ kleinem oder großem Einzugsgebiet
DE	LW	Mid-altitude	N/A	5	Kalkreicher, geschichteter Mittelgebirgssee mit relativ großem Einzugsgebiet
DE	LW	Mid-altitude	N/A	6	Kalkreicher, ungeschichteter Mittelgebirgssee mit relativ großem Einzugsgebiet
DE	LW	Mid-altitude	N/A	7	Kalkreicher, geschichteter Mittelgebirgssee mit relativ kleinem Einzugsgebiet
DE	LW	Mid-altitude	N/A	8	Kalkarmer, geschichteter Mittelgebirgssee mit relativ großem Einzugsgebiet
DE	LW	N/A	N/A	88	Sondertyp natürlicher Seen (Moorsee, Strandsee u.s.w.)
DE	LW	Mid-altitude	N/A	9	Kalkarmer, geschichteter Mittelgebirgssee mit relativ kleinem Einzugsgebiet
DE	LW	N/A	N/A	99	Sondertyp künstlicher Seen (z.B. Abgrabungsseen)

Table A7.2. Ireland

Country	Water Category Code	Broad Altitude Type	Size	TYPE_CODE	TYPE_NAME
IE	RW	Lowland	N/A	11	Siliceous, low slope
IE	RW	Mid-altitude	N/A	12	Siliceous, medium slope
IE	RW	Mid-altitude	N/A	13	Siliceous, high slope
IE	RW	Mid-altitude	N/A	14	Siliceous, very high slope
IE	RW	Lowland	N/A	21	Mixed geology, low slope
IE	RW	Mid-altitude	N/A	22	Mixed geology, medium slope
IE	RW	Mid-altitude	N/A	23	Mixed geology, high slope
IE	RW	Mid-altitude	N/A	24	Mixed geology, very high slope
IE	RW	Lowland	N/A	31	Calcareous, low slope
IE	RW	Mid-altitude	N/A	32	Calcareous, medium slope
IE	RW	Mid-altitude	N/A	33	Calcareous, high slope
IE	RW	Mid-altitude	N/A	34	Calcareous, very high slope
IE	LW	Mid-altitude	N/A	13	Some lakes >200 m altitude
IE	LW	N/A	N/A	1	Low alkalinity, shallow and small
IE	LW	N/A	N/A	11	High alkalinity, deep and small
IE	LW	N/A	N/A	3	Low alkalinity, deep and small
IE	LW	N/A	N/A	5	Moderate alkalinity, shallow and small
IE	LW	N/A	N/A	7	Moderate alkalinity, deep and small
IE	LW	N/A	N/A	9	High alkalinity, shallow and small
IE	LW	N/A	N/A	10	High alkalinity, shallow and large
IE	LW	N/A	N/A	12	High alkalinity, deep and large
IE	LW	N/A	N/A	2	Low alkalinity, shallow and large
IE	LW	N/A	N/A	4	Low alkalinity, deep and large
IE	LW	N/A	N/A	6	Moderate alkalinity, shallow and large
IE	LW	N/A	N/A	8	Moderate alkalinity, deep and large

Table A7.3. Sweden

Country	Water Category Code	Broad Altitude Type	Size	TYPE_CODE	TYPE_NAME
SE	RW	Alpine	Rivers	V1LNN	VattendragFjällen över trädgränsen, Stor: >100 km2Nej - = 50 mgPt/lNej = 1,0 mekv Alk
SE	RW	Alpine	Rivers	V1LNY	VattendragFjällen över trädgränsen, Stor: >100 km2Nej - = 50 mgPt/lJa > 1,0 mekv Alk
SE	RW	Alpine	Rivers	V1LYN	VattendragFjällen över trädgränsen, Stor: >100 km2Ja - >50 mgPt/lNej = 1,0 mekv Alk
SE	RW	Mid-altitude	Rivers	V2LNN	VattendragNorrlands inland, under högsta trädgränsen över högsta kustlinjen, Stor: >100 km2Nej - = 50 mgPt/lNej = 1,0 mekv Alk
SE	RW	Mid-altitude	Rivers	V2LNY	VattendragNorrlands inland, under högsta trädgränsen över högsta kustlinjen, Stor: >100 km2Nej - = 50 mgPt/lJa > 1,0 mekv Alk
SE	RW	Mid-altitude	Rivers	V2LYN	VattendragNorrlands inland, under högsta trädgränsen över högsta kustlinjen, Stor: >100 km2Ja - >50 mgPt/lNej = 1,0 mekv Alk
SE	RW	Mid-altitude	Rivers	V2LYY	VattendragNorrlands inland, under högsta trädgränsen över högsta kustlinjen, Stor: >100 km2Ja - >50 mgPt/lJa > 1,0 mekv Alk
SE	RW	Lowland	Rivers	V3LNN	VattendragNorrland kust, under högsta kustlinjen, Stor: >100 km2Nej - = 50 mgPt/lNej = 1,0 mekv Alk
SE	RW	Lowland	Rivers	V3LNY	VattendragNorrland kust, under högsta kustlinjen, Stor: >100 km2Nej - = 50 mgPt/lJa > 1,0 mekv Alk
SE	RW	Lowland	Rivers	V3LYN	VattendragNorrland kust, under högsta kustlinjen, Stor: >100 km2Ja - >50 mgPt/lNej = 1,0 mekv Alk
SE	RW	Lowland	Rivers	V3LYY	VattendragNorrland kust, under högsta kustlinjen, Stor: >100 km2Ja - >50 mgPt/lJa > 1,0 mekv Alk
SE	RW	Lowland	Rivers	V4LNN	VattendragSydöst, söder om norrlandsgränsen, inom vattendelaren till Östersjön, under 200 m.ö.h., Stor: >100 km2Nej - = 50 mgPt/lNej = 1,0 mekv Alk
SE	RW	Lowland	Rivers	V4LNY	VattendragSydöst, söder om norrlandsgränsen, inom vattendelaren till Östersjön, under 200 m.ö.h., Stor: >100 km2Nej - = 50 mgPt/lJa > 1,0 mekv Alk
SE	RW	Lowland	Rivers	V4LYN	VattendragSydöst, söder om norrlandsgränsen, inom vattendelaren till Östersjön, under 200 m.ö.h., Stor: >100 km2Ja - >50 mgPt/lNej = 1,0 mekv Alk
SE	RW	Lowland	Rivers	V4LYY	VattendragSydöst, söder om norrlandsgränsen, inom vattendelaren till Östersjön, under 200 m.ö.h., Stor: >100 km2Ja - >50 mgPt/lJa > 1,0 mekv Alk
SE	RW	Lowland	Rivers	V5LNN	Vattendrag5. Södra Sverige, Skåne, Blekinges kust och del av Öland., Stor: >100 km2Nej - = 50 mgPt/lNej = 1,0 mekv Alk
SE	RW	Lowland	Rivers	V5LNY	Vattendrag5. Södra Sverige, Skåne, Blekinges kust och del av Öland., Stor: >100 km2Nej - = 50 mgPt/lJa > 1,0 mekv Alk
SE	RW	Lowland	Rivers	V5LYN	Vattendrag5. Södra Sverige, Skåne, Blekinges kust och del av Öland., Stor: >100 km2Ja - >50 mgPt/lNej = 1,0 mekv Alk
SE	RW	Lowland	Rivers	V5LYY	Vattendrag5. Södra Sverige, Skåne, Blekinges kust och del av Öland., Stor: >100 km2Ja - >50 mgPt/lJa > 1,0 mekv Alk
SE	RW	Lowland	Rivers	V6LNN	VattendragSydväst, söder om norrlandsgränsen, inom vattendelaren till Västerhavet, under 200 m.ö.h., Stor: >100 km2Nej - = 50 mgPt/lNej = 1,0 mekv Alk

Country	Water Category Code	Broad Altitude Type	Size	TYPE_CODE	TYPE_NAME
SE	RW	Lowland	Rivers	V6LNY	VattendragSydväst, söder om norrlandsgränsen, inom vattendelaren till Västerhavet, under 200 m.ö.h., Stor: >100 km2Nej - = 50 mgPt/lJa > 1,0 mekv Alk
SE	RW	Lowland	Rivers	V6LYN	VattendragSydväst, söder om norrlandsgränsen, inom vattendelaren till Västerhavet, under 200 m.ö.h., Stor: >100 km2Ja - >50 mgPt/lNej = 1,0 mekv Alk
SE	RW	Lowland	Rivers	V6LYY	VattendragSydväst, söder om norrlandsgränsen, inom vattendelaren till Västerhavet, under 200 m.ö.h., Stor: >100 km2Ja - >50 mgPt/lJa > 1,0 mekv Alk
SE	RW	Mid-altitude	Rivers	V7LNN	VattendragSydsvenska höglandet, söder om norrlandsgränsen, över 200 m.ö.h., Stor: >100 km2Nej - = 50 mgPt/lNej = 1,0 mekv Alk
SE	RW	Mid-altitude	Rivers	V7LYN	VattendragSydsvenska höglandet, söder om norrlandsgränsen, över 200 m.ö.h., Stor: >100 km2Ja - >50 mgPt/lNej = 1,0 mekv Alk
SE	RW	Mid-altitude	Rivers	V7LYY	VattendragSydsvenska höglandet, söder om norrlandsgränsen, över 200 m.ö.h., Stor: >100 km2Ja - >50 mgPt/lJa > 1,0 mekv Alk
SE	RW	N/A	Rivers	V-LYN	Vattendrag-, Stor: >100 km2Ja - >50 mgPt/lNej = 1,0 mekv Alk
SE	RW	Alpine	Streams	V1SNN	VattendragFjällen över trädgränsen, Liten: = 100 km²Nej - = 50 mgPt/lNej = 1,0 mekv Alk
SE	RW	Alpine	Streams	V1SNY	VattendragFjällen över trädgränsen, Liten: = 100 km²Nej - = 50 mgPt/lJa > 1,0 mekv Alk
SE	RW	Alpine	Streams	V1SYN	VattendragFjällen över trädgränsen, Liten: = 100 km²Ja - >50 mgPt/lNej = 1,0 mekv Alk
SE	RW	Mid-altitude	Streams	V2SNN	VattendragNorrlands inland, under högsta trädgränsen över högsta kustlinjen, Liten: = 100 km²Nej - = 50 mgPt/lNej = 1,0 mekv Alk
SE	RW	Mid-altitude	Streams	V2SNY	VattendragNorrlands inland, under högsta trädgränsen över högsta kustlinjen, Liten: = 100 km²Nej - = 50 mgPt/lJa > 1,0 mekv Alk
SE	RW	Mid-altitude	Streams	V2SYN	VattendragNorrlands inland, under högsta trädgränsen över högsta kustlinjen, Liten: = 100 km²Ja - >50 mgPt/lNej = 1,0 mekv Alk
SE	RW	Mid-altitude	Streams	V2SYY	VattendragNorrlands inland, under högsta trädgränsen över högsta kustlinjen, Liten: = 100 km²Ja - >50 mgPt/lJa > 1,0 mekv Alk
SE	RW	Lowland	Streams	V3SNN	VattendragNorrland kust, under högsta kustlinjen, Liten: = 100 km²Nej - = 50 mgPt/lNej = 1,0 mekv Alk
SE	RW	Lowland	Streams	V3SNY	VattendragNorrland kust, under högsta kustlinjen, Liten: = 100 km²Nej - = 50 mgPt/lJa > 1,0 mekv Alk
SE	RW	Lowland	Streams	V3SYN	VattendragNorrland kust, under högsta kustlinjen, Liten: = 100 km²Ja - >50 mgPt/lNej = 1,0 mekv Alk
SE	RW	Lowland	Streams	V3SYY	VattendragNorrland kust, under högsta kustlinjen, Liten: = 100 km²Ja - >50 mgPt/lJa > 1,0 mekv Alk
SE	RW	Lowland	Streams	V4SNN	VattendragSydöst, söder om norrlandsgränsen, inom vattendelaren till Östersjön, under 200 m.ö.h., Liten: = 100 km²Nej - = 50 mgPt/lNej = 1,0 mekv Alk
SE	RW	Lowland	Streams	V4SNY	VattendragSydöst, söder om norrlandsgränsen, inom vattendelaren till Östersjön, under 200 m.ö.h., Liten: = 100 km²Nej - = 50 mgPt/lJa > 1,0 mekv Alk
SE	RW	Lowland	Streams	V4SYN	VattendragSydöst, söder om norrlandsgränsen, inom vattendelaren till Östersjön, under 200 m.ö.h., Liten: = 100 km²Ja - >50 mgPt/lNej = 1,0 mekv Alk

Country	Water Category Code	Broad Altitude Type	Size	TYPE_CODE	TYPE_NAME
SE	RW	Lowland	Streams	V4SYY	VattendragSydöst, söder om norrlandsgränsen, inom vattendelaren till Östersjön, under 200 m.ö.h., Liten: = 100 km²Ja - >50 mgPt/lJa > 1,0 mekv Alk
SE	RW	Lowland	Streams	V5SNN	Vattendrag5. Södra Sverige, Skåne, Blekinges kust och del av Öland., Liten: = 100 km²Nej - = 50 mgPt/lNej = 1,0 mekv Alk
SE	RW	Lowland	Streams	V5SNY	Vattendrag5. Södra Sverige, Skåne, Blekinges kust och del av Öland., Liten: = 100 km²Nej - = 50 mgPt/lJa > 1,0 mekv Alk
SE	RW	Lowland	Streams	V5SYN	Vattendrag5. Södra Sverige, Skåne, Blekinges kust och del av Öland., Liten: = 100 km²Ja - >50 mgPt/lNej = 1,0 mekv Alk
SE	RW	Lowland	Streams	V5SYY	Vattendrag5. Södra Sverige, Skåne, Blekinges kust och del av Öland., Liten: = 100 km²Ja - >50 mgPt/lJa > 1,0 mekv Alk
SE	RW	Lowland	Streams	V6SNN	VattendragSydväst, söder om norrlandsgränsen, inom vattendelaren till Västerhavet, under 200 m.ö.h., Liten: = 100 km²Nej - = 50 mgPt/lNej = 1,0 mekv Alk
SE	RW	Lowland	Streams	V6SNY	VattendragSydväst, söder om norrlandsgränsen, inom vattendelaren till Västerhavet, under 200 m.ö.h., Liten: = 100 km²Nej - = 50 mgPt/lJa > 1,0 mekv Alk
SE	RW	Lowland	Streams	V6SYN	VattendragSydväst, söder om norrlandsgränsen, inom vattendelaren till Västerhavet, under 200 m.ö.h., Liten: = 100 km²Ja - >50 mgPt/lNej = 1,0 mekv Alk
SE	RW	Lowland	Streams	V6SYY	VattendragSydväst, söder om norrlandsgränsen, inom vattendelaren till Västerhavet, under 200 m.ö.h., Liten: = 100 km²Ja - >50 mgPt/lJa > 1,0 mekv Alk
SE	RW	Mid-altitude	Streams	V7SNN	VattendragSydsvenska höglandet, söder om norrlandsgränsen, över 200 m.ö.h., Liten: = 100 km²Nej - = 50 mgPt/lNej = 1,0 mekv Alk
SE	RW	Mid-altitude	Streams	V7SYN	VattendragSydsvenska höglandet, söder om norrlandsgränsen, över 200 m.ö.h., Liten: = 100 km²Ja - >50 mgPt/lNej = 1,0 mekv Alk
SE	RW	Mid-altitude	Streams	V7SYY	VattendragSydsvenska höglandet, söder om norrlandsgränsen, över 200 m.ö.h.Liten: = 100 km²Ja - >50 mgPt/lJa > 1,0 mekv Alk
SE	LW	Lowland	N/A	S3----	SjöNorrland kust, under högsta kustlinjen----
SE	LW	Alpine	N/A	S1DLNN	SjöFjällen över trädgränsen, Djup: Max, Djup >5m/ Medel, Djup >4m, Stor: >10km²Nej - = 50 mgPt/lNej = 1,0 mekv Alk
SE	LW	Mid-altitude	N/A	S2DLNN	SjöNorrlands inland, under högsta trädgränsen över högsta kustlinjen, Djup: Max, Djup >5m/ Medel, Djup >4m, Stor: >10km²Nej - = 50 mgPt/lNej = 1,0 mekv Alk
SE	LW	Mid-altitude	N/A	S2DLNY	SjöNorrlands inland, under högsta trädgränsen över högsta kustlinjen, Djup: Max, Djup >5m/ Medel, Djup >4m, Stor: >10km²Nej - = 50 mgPt/lJa > 1,0 mekv Alk
SE	LW	Mid-altitude	N/A	S2DLYN	SjöNorrlands inland, under högsta trädgränsen över högsta kustlinjen, Djup: Max, Djup >5m/ Medel, Djup >4m, Stor: >10km²Ja - >50 mgPt/lNej = 1,0 mekv Alk
SE	LW	Mid-altitude	N/A	S2SLNN	SjöNorrlands inland, under högsta trädgränsen över högsta kustlinjen, Grund: Max, Djup = 5 m/ Medel, Djup = 4m, Stor: >10km²Nej - = 50 mgPt/lNej = 1,0 mekv Alk
SE	LW	Lowland	N/A	S3DLNN	SjöNorrland kust, under högsta kustlinjen, Djup: Max, Djup >5m/ Medel, Djup >4m, Stor: >10km²Nej - = 50 mgPt/lNej = 1,0 mekv Alk
SE	LW	Lowland	N/A	S3DLYN	SjöNorrland kust, under högsta kustlinjen, Djup: Max, Djup >5m/ Medel, Djup >4m, Stor: >10km²Ja - >50 mgPt/lNej = 1,0 mekv Alk

Country	Water Category Code	Broad Altitude Type	Size	TYPE_CODE	TYPE_NAME
SE	LW	Lowland	N/A	S3SLNN	SjöNorrland kust, under högsta kustlinjen, Grund: Max, Djup = 5 m/ Medel, Djup = 4m, Stor: >10km^2Nej - = 50 mgPt/lNej = 1,0 mekv Alk
SE	LW	Lowland	N/A	S3SLYN	SjöNorrland kust, under högsta kustlinjen, Grund: Max, Djup = 5 m/ Medel, Djup = 4m, Stor: >10km^2Ja - >50 mgPt/lNej = 1,0 mekv Alk
SE	LW	Mid-altitude	N/A	S4DLNN	SjöSydöst, söder om norrlandsgränsen, inom vattendelaren till Östersjön, under 200 m.ö.h., Djup: Max, Djup >5m/ Medel, Djup >4m, Stor: >10km^2Nej - = 50 mgPt/lNej = 1,0 mekv Alk
SE	LW	Mid-altitude	N/A	S4DLNY	SjöSydöst, söder om norrlandsgränsen, inom vattendelaren till Östersjön, under 200 m.ö.h., Djup: Max, Djup >5m/ Medel, Djup >4m, Stor: >10km^2Nej - = 50 mgPt/lJa > 1,0 mekv Alk
SE	LW	Mid-altitude	N/A	S4DLYN	SjöSydöst, söder om norrlandsgränsen, inom vattendelaren till Östersjön, under 200 m.ö.h., Djup: Max, Djup >5m/ Medel, Djup >4m, Stor: >10km^2Ja - >50 mgPt/lNej = 1,0 mekv Alk
SE	LW	Mid-altitude	N/A	S4DLYY	SjöSydöst, söder om norrlandsgränsen, inom vattendelaren till Östersjön, under 200 m.ö.h., Djup: Max, Djup >5m/ Medel, Djup >4m, Stor: >10km^2Ja - >50 mgPt/lJa > 1,0 mekv Alk
SE	LW	Mid-altitude	N/A	S4SLNN	SjöSydöst, söder om norrlandsgränsen, inom vattendelaren till Östersjön, under 200 m.ö.h., Grund: Max, Djup = 5 m/ Medel, Djup = 4m, Stor: >10km^2Nej - = 50 mgPt/lNej = 1,0 mekv Alk
SE	LW	Mid-altitude	N/A	S4SLNY	SjöSydöst, söder om norrlandsgränsen, inom vattendelaren till Östersjön, under 200 m.ö.h., Grund: Max, Djup = 5 m/ Medel, Djup = 4m, Stor: >10km^2Nej - = 50 mgPt/lJa > 1,0 mekv Alk
SE	LW	Mid-altitude	N/A	S4SLYY	SjöSydöst, söder om norrlandsgränsen, inom vattendelaren till Östersjön, under 200 m.ö.h., Grund: Max, Djup = 5 m/ Medel, Djup = 4m, Stor: >10km^2Ja - >50 mgPt/lJa > 1,0 mekv Alk
SE	LW	Lowland	N/A	S5DLNN	Sjö5. Södra Sverige, Skåne, Blekinges kust och del av Öland., Djup: Max, Djup >5m/ Medel, Djup >4m, Stor: >10km^2Nej - = 50 mgPt/lNej = 1,0 mekv Alk
SE	LW	Lowland	N/A	S5DLNY	Sjö5. Södra Sverige, Skåne, Blekinges kust och del av Öland., Djup: Max, Djup >5m/ Medel, Djup >4m, Stor: >10km^2Nej - = 50 mgPt/lJa > 1,0 mekv Alk
SE	LW	Lowland	N/A	S5DLYN	Sjö5. Södra Sverige, Skåne, Blekinges kust och del av Öland., Djup: Max, Djup >5m/ Medel, Djup >4m, Stor: >10km^2Ja - >50 mgPt/lNej = 1,0 mekv Alk
SE	LW	Lowland	N/A	S5SLNY	Sjö5. Södra Sverige, Skåne, Blekinges kust och del av Öland., Grund: Max, Djup = 5 m/ Medel, Djup = 4m, Stor: >10km^2Nej - = 50 mgPt/lJa > 1,0 mekv Alk
SE	LW	Lowland	N/A	S5SLYN	Sjö5. Södra Sverige, Skåne, Blekinges kust och del av Öland., Grund: Max, Djup = 5 m/ Medel, Djup = 4m, Stor: >10km^2Ja - >50 mgPt/lNej = 1,0 mekv Alk
SE	LW	Lowland	N/A	S6DLNN	SjöSydväst, söder om norrlandsgränsen, inom vattendelaren till Västerhavet, under 200 m.ö.h., Djup: Max, Djup >5m/ Medel, Djup >4m, Stor: >10km^2Nej - = 50 mgPt/lNej = 1,0 mekv Alk
SE	LW	Lowland	N/A	S6DLYN	SjöSydväst, söder om norrlandsgränsen, inom vattendelaren till Västerhavet, under 200 m.ö.h., Djup: Max, Djup >5m/ Medel, Djup >4m, Stor: >10km^2Ja - >50 mgPt/lNej = 1,0 mekv Alk
SE	LW	Lowland	N/A	S6SLNN	SjöSydväst, söder om norrlandsgränsen, inom vattendelaren till Västerhavet, under 200 m.ö.h., Grund: Max, Djup = 5 m/ Medel, Djup = 4m, Stor: >10km^2Nej - = 50 mgPt/lNej = 1,0 mekv Alk
SE	LW	Lowland	N/A	S6SLYN	SjöSydväst, söder om norrlandsgränsen, inom vattendelaren till Västerhavet, under 200 m.ö.h., Grund: Max, Djup = 5 m/ Medel, Djup = 4m, Stor: >10km^2Ja - >50 mgPt/lNej = 1,0 mekv Alk
SE	LW	Lowland	N/A	S6SLYY	SjöSydväst, söder om norrlandsgränsen, inom vattendelaren till Västerhavet, under 200 m.ö.h., Grund: Max, Djup = 5 m/ Medel, Djup = 4m, Stor: >10km^2Ja - >50 mgPt/lJa > 1,0 mekv Alk
SE	LW	Mid-altitude	N/A	S7DLNN	SjöSydsvenska höglandet, söder om norrlandsgränsen, över 200 m.ö.h., Djup: Max, Djup >5m/

Country	Water Category Code	Broad Altitude Type	Size	TYPE_CODE	TYPE_NAME
					Medel, Djup >4m, Stor: >10km²Nej - = 50 mgPt/lNej = 1,0 mekv Alk
SE	LW	Mid-altitude	N/A	S7DLYN	SjöSydsvenska höglandet, söder om norrlandsgränsen, över 200 m.ö.h., Djup: Max, Djup >5m/ Medel, Djup >4m, Stor: >10km²Ja - >50 mgPt/lNej = 1,0 mekv Alk
SE	LW	Alpine	N/A	S1DSNN	SjöFjällen över trädgränsen, Djup: Max, Djup >5m/ Medel, Djup >4m, Liten: = 10km²Nej - = 50 mgPt/lNej = 1,0 mekv Alk
SE	LW	Alpine	N/A	S1DSNY	SjöFjällen över trädgränsen, Djup: Max, Djup >5m/ Medel, Djup >4m, Liten: = 10km²Nej - = 50 mgPt/lJa > 1,0 mekv Alk
SE	LW	Alpine	N/A	S1DSYN	SjöFjällen över trädgränsen, Djup: Max, Djup >5m/ Medel, Djup >4m, Liten: = 10km²Ja - >50 mgPt/lNej = 1,0 mekv Alk
SE	LW	Alpine	N/A	S1SSNN	SjöFjällen över trädgränsen, Grund: Max, Djup = 5 m/ Medel, Djup = 4m, Liten: = 10km²Nej - = 50 mgPt/lNej = 1,0 mekv Alk
SE	LW	Alpine	N/A	S1SSNY	SjöFjällen över trädgränsen, Grund: Max, Djup = 5 m/ Medel, Djup = 4m, Liten: = 10km²Nej - = 50 mgPt/lJa > 1,0 mekv Alk
SE	LW	Alpine	N/A	S1SSYN	SjöFjällen över trädgränsen, Grund: Max, Djup = 5 m/ Medel, Djup = 4m, Liten: = 10km²Ja - >50 mgPt/lNej = 1,0 mekv Alk
SE	LW	Mid-altitude	N/A	S2DSNN	SjöNorrlands inland, under högsta trädgränsen över högsta kustlinjen, Djup: Max, Djup >5m/ Medel, Djup >4m, Liten: = 10km²Nej - = 50 mgPt/lNej = 1,0 mekv Alk
SE	LW	Mid-altitude	N/A	S2DSNY	SjöNorrlands inland, under högsta trädgränsen över högsta kustlinjen, Djup: Max, Djup >5m/ Medel, Djup >4m, Liten: = 10km²Nej - = 50 mgPt/lJa > 1,0 mekv Alk
SE	LW	Mid-altitude	N/A	S2DSYN	SjöNorrlands inland, under högsta trädgränsen över högsta kustlinjen, Djup: Max, Djup >5m/ Medel, Djup >4m, Liten: = 10km²Ja - >50 mgPt/lNej = 1,0 mekv Alk
SE	LW	Mid-altitude	N/A	S2DSYY	SjöNorrlands inland, under högsta trädgränsen över högsta kustlinjen, Djup: Max, Djup >5m/ Medel, Djup >4m, Liten: = 10km²Ja - >50 mgPt/lJa > 1,0 mekv Alk
SE	LW	Mid-altitude	N/A	S2SSNN	SjöNorrlands inland, under högsta trädgränsen över högsta kustlinjen, Grund: Max, Djup = 5 m/ Medel, Djup = 4m, Liten: = 10km²Nej - = 50 mgPt/lNej = 1,0 mekv Alk
SE	LW	Mid-altitude	N/A	S2SSNY	SjöNorrlands inland, under högsta trädgränsen över högsta kustlinjen, Grund: Max, Djup = 5 m/ Medel, Djup = 4m, Liten: = 10km²Nej - = 50 mgPt/lJa > 1,0 mekv Alk
SE	LW	Mid-altitude	N/A	S2SSYN	SjöNorrlands inland, under högsta trädgränsen över högsta kustlinjen, Grund: Max, Djup = 5 m/ Medel, Djup = 4m, Liten: = 10km²Ja - >50 mgPt/lNej = 1,0 mekv Alk
SE	LW	Mid-altitude	N/A	S2SSYY	SjöNorrlands inland, under högsta trädgränsen över högsta kustlinjen, Grund: Max, Djup = 5 m/ Medel, Djup = 4m, Liten: = 10km²Ja - >50 mgPt/lJa > 1,0 mekv Alk
SE	LW	Lowland	N/A	S3DSNN	SjöNorrland kust, under högsta kustlinjen, Djup: Max, Djup >5m/ Medel, Djup >4m, Liten: = 10km²Nej - = 50 mgPt/lNej = 1,0 mekv Alk
SE	LW	Lowland	N/A	S3DSNY	SjöNorrland kust, under högsta kustlinjen, Djup: Max, Djup >5m/ Medel, Djup >4m, Liten: = 10km²Nej - = 50 mgPt/lJa > 1,0 mekv Alk
SE	LW	Lowland	N/A	S3DSYN	SjöNorrland kust, under högsta kustlinjen, Djup: Max, Djup >5m/ Medel, Djup >4m, Liten: = 10km²Ja - >50 mgPt/lNej = 1,0 mekv Alk
SE	LW	Lowland	N/A	S3SSNN	SjöNorrland kust, under högsta kustlinjen, Grund: Max, Djup = 5 m/ Medel, Djup = 4m, Liten: = 10km²Nej - = 50 mgPt/lNej = 1,0 mekv Alk

Country	Water Category Code	Broad Altitude Type	Size	TYPE_CODE	TYPE_NAME
SE	LW	Lowland	N/A	S3SSNY	SjöNorrland kust, under högsta kustlinjen, Grund: Max, Djup = 5 m/ Medel, Djup = 4m, Liten: = 10km^{2}Nej - = 50 mgPt/lJa > 1,0 mekv Alk
SE	LW	Lowland	N/A	S3SSYN	SjöNorrland kust, under högsta kustlinjen, Grund: Max, Djup = 5 m/ Medel, Djup = 4m, Liten: = 10km^{2}Ja - >50 mgPt/lNej = 1,0 mekv Alk
SE	LW	Lowland	N/A	S3SSYY	SjöNorrland kust, under högsta kustlinjen, Grund: Max, Djup = 5 m/ Medel, Djup = 4m, Liten: = 10km^{2}Ja - >50 mgPt/lJa > 1,0 mekv Alk
SE	LW	Lowland	N/A	S4DSNN	SjöSydöst, söder om norrlandsgränsen, inom vattendelaren till Östersjön, under 200 m.ö.h., Djup: Max, Djup >5m/ Medel, Djup >4m, Liten: = 10km^{2}Nej - = 50 mgPt/lNej = 1,0 mekv Alk
SE	LW	Lowland	N/A	S4DSNY	SjöSydöst, söder om norrlandsgränsen, inom vattendelaren till Östersjön, under 200 m.ö.h., Djup: Max, Djup >5m/ Medel, Djup >4m, Liten: = 10km^{2}Nej - = 50 mgPt/lJa > 1,0 mekv Alk
SE	LW	Lowland	N/A	S4DSYN	SjöSydöst, söder om norrlandsgränsen, inom vattendelaren till Östersjön, under 200 m.ö.h., Djup: Max, Djup >5m/ Medel, Djup >4m, Liten: = 10km^{2}Ja - >50 mgPt/lNej = 1,0 mekv Alk
SE	LW	Lowland	N/A	S4DSYY	SjöSydöst, söder om norrlandsgränsen, inom vattendelaren till Östersjön, under 200 m.ö.h., Djup: Max, Djup >5m/ Medel, Djup >4m, Liten: = 10km^{2}Ja - >50 mgPt/lJa > 1,0 mekv Alk
SE	LW	Lowland	N/A	S4SSNN	SjöSydöst, söder om norrlandsgränsen, inom vattendelaren till Östersjön, under 200 m.ö.h., Grund: Max, Djup = 5 m/ Medel, Djup = 4m, Liten: = 10km^{2}Nej - = 50 mgPt/lNej = 1,0 mekv Alk
SE	LW	Lowland	N/A	S4SSNY	SjöSydöst, söder om norrlandsgränsen, inom vattendelaren till Östersjön, under 200 m.ö.h., Grund: Max, Djup = 5 m/ Medel, Djup = 4m, Liten: = 10km^{2}Nej - = 50 mgPt/lJa > 1,0 mekv Alk
SE	LW	Lowland	N/A	S4SSYN	SjöSydöst, söder om norrlandsgränsen, inom vattendelaren till Östersjön, under 200 m.ö.h., Grund: Max, Djup = 5 m/ Medel, Djup = 4m, Liten: = 10km^{2}Ja - >50 mgPt/lNej = 1,0 mekv Alk
SE	LW	Lowland	N/A	S4SSYY	SjöSydöst, söder om norrlandsgränsen, inom vattendelaren till Östersjön, under 200 m.ö.h., Grund: Max, Djup = 5 m/ Medel, Djup = 4m, Liten: = 10km^{2}Ja - >50 mgPt/lJa > 1,0 mekv Alk
SE	LW	Lowland	N/A	S5DSNN	Sjö5. Södra Sverige, Skåne, Blekinges kust och del av Öland., Djup: Max, Djup >5m/ Medel, Djup >4m, Liten: = 10km^{2}Nej - = 50 mgPt/lNej = 1,0 mekv Alk
SE	LW	Lowland	N/A	S5DSNY	Sjö5. Södra Sverige, Skåne, Blekinges kust och del av Öland., Djup: Max, Djup >5m/ Medel, Djup >4m, Liten: = 10km^{2}Nej - = 50 mgPt/lJa > 1,0 mekv Alk
SE	LW	Lowland	N/A	S5DSYN	Sjö5. Södra Sverige, Skåne, Blekinges kust och del av Öland., Djup: Max, Djup >5m/ Medel, Djup >4m, Liten: = 10km^{2}Ja - >50 mgPt/lNej = 1,0 mekv Alk
SE	LW	Lowland	N/A	S5SSNN	Sjö5. Södra Sverige, Skåne, Blekinges kust och del av Öland., Grund: Max, Djup = 5 m/ Medel, Djup = 4m, Liten: = 10km^{2}Nej - = 50 mgPt/lNej = 1,0 mekv Alk
SE	LW	Lowland	N/A	S5SSNY	Sjö5. Södra Sverige, Skåne, Blekinges kust och del av Öland., Grund: Max, Djup = 5 m/ Medel, Djup = 4m, Liten: = 10km^{2}Nej - = 50 mgPt/lJa > 1,0 mekv Alk
SE	LW	Lowland	N/A	S5SSYN	Sjö5. Södra Sverige, Skåne, Blekinges kust och del av Öland., Grund: Max, Djup = 5 m/ Medel, Djup = 4m, Liten: = 10km^{2}Ja - >50 mgPt/lNej = 1,0 mekv Alk
SE	LW	Lowland	N/A	S5SSYY	Sjö5. Södra Sverige, Skåne, Blekinges kust och del av Öland., Grund: Max, Djup = 5 m/ Medel, Djup = 4m, Liten: = 10km^{2}Ja - >50 mgPt/lJa > 1,0 mekv Alk
SE	LW	Lowland	N/A	S6DSNN	SjöSydväst, söder om norrlandsgränsen, inom vattendelaren till Västerhavet, under 200 m.ö.h., Djup: Max, Djup >5m/ Medel, Djup >4m, Liten: = 10km^{2}Nej - = 50 mgPt/lNej = 1,0 mekv Alk
SE	LW	Lowland	N/A	S6DSYN	SjöSydväst, söder om norrlandsgränsen, inom vattendelaren till Västerhavet, under 200 m.ö.h., Djup:

Country	Water Category Code	Broad Altitude Type	Size	TYPE_CODE	TYPE_NAME
					Max, Djup >5m/ Medel, Djup >4m, Liten: = 10km²Ja - >50 mgPt/lNej = 1,0 mekv Alk
SE	LW	Lowland	N/A	S6DSYY	SjöSydväst, söder om norrlandsgränsen, inom vattendelaren till Västerhavet, under 200 m.ö.h., Djup: Max, Djup >5m/ Medel, Djup >4m, Liten: = 10km²Ja - >50 mgPt/lJa > 1,0 mekv Alk
SE	LW	Lowland	N/A	S6SSNN	SjöSydväst, söder om norrlandsgränsen, inom vattendelaren till Västerhavet, under 200 m.ö.h., Grund: Max, Djup = 5 m/ Medel, Djup = 4m, Liten: = 10km²Nej - = 50 mgPt/lNej = 1,0 mekv Alk
SE	LW	Lowland	N/A	S6SSYN	SjöSydväst, söder om norrlandsgränsen, inom vattendelaren till Västerhavet, under 200 m.ö.h., Grund: Max, Djup = 5 m/ Medel, Djup = 4m, Liten: = 10km²Ja - >50 mgPt/lNej = 1,0 mekv Alk
SE	LW	Lowland	N/A	S6SSYY	SjöSydväst, söder om norrlandsgränsen, inom vattendelaren till Västerhavet, under 200 m.ö.h., Grund: Max, Djup = 5 m/ Medel, Djup = 4m, Liten: = 10km²Ja - >50 mgPt/lJa > 1,0 mekv Alk
SE	LW	Mid-altitude	N/A	S7DSNN	SjöSydsvenska höglandet, söder om norrlandsgränsen, över 200 m.ö.h., Djup: Max, Djup >5m/ Medel, Djup >4m, Liten: = 10km²Nej - = 50 mgPt/lNej = 1,0 mekv Alk
SE	LW	Mid-altitude	N/A	S7DSYN	SjöSydsvenska höglandet, söder om norrlandsgränsen, över 200 m.ö.h., Djup: Max, Djup >5m/ Medel, Djup >4m, Liten: = 10km²Ja - >50 mgPt/lNej = 1,0 mekv Alk
SE	LW	Mid-altitude	N/A	S7DSYY	SjöSydsvenska höglandet, söder om norrlandsgränsen, över 200 m.ö.h., Djup: Max, Djup >5m/ Medel, Djup >4m, Liten: = 10km²Ja - >50 mgPt/lJa > 1,0 mekv Alk
SE	LW	Mid-altitude	N/A	S7SSNN	SjöSydsvenska höglandet, söder om norrlandsgränsen, över 200 m.ö.h., Grund: Max, Djup = 5 m/ Medel, Djup = 4m, Liten: = 10km²Nej - = 50 mgPt/lNej = 1,0 mekv Alk
SE	LW	Mid-altitude	N/A	S7SSYN	SjöSydsvenska höglandet, söder om norrlandsgränsen, över 200 m.ö.h., Grund: Max, Djup = 5 m/ Medel, Djup = 4m, Liten: = 10km²Ja - >50 mgPt/lNej = 1,0 mekv Alk

Table A7.4. Hungary

Country	Water Category Code	Broad Altitude Type	Size	TYPE_CODE	TYPE_NAME
HU	LW	N/A	Small	10L	meszes – kis területű – sekély – benőtt vízfelületű – időszakos
HU	LW	N/A	Small	11L	meszes – kis területű – sekély – nyílt vízfelületű – időszakos
HU	LW	N/A	Small	12L	meszes – kis területű – sekély – benőtt vízfelületű – állandó
HU	LW	N/A	Small	13L	meszes – kis területű – sekély – nyílt vízfelületű – állandó
HU	LW	N/A	Small	14L	meszes – kis területű – közepes mélységű – nyílt vízfelületű – állandó
HU	LW	N/A	Medium	15L	meszes – közepes területű – sekély – nyílt vízfelületű – állandó
HU	LW	N/A	Large	16L	meszes – nagy területű – közepes mélységű – nyílt vízfelületű – állandó
HU	LW	N/A	Small	1L	szerves – kis területű – sekély – benőtt vízfelületű – időszakos
HU	LW	N/A	Small	2L	szerves – kis területű – sekély – benőtt vízfelületű – állandó
HU	LW	N/A	Small	3L	szerves – kis területű – sekély – nyílt vízfelületű – állandó
HU	LW	N/A	Small	4L	szikes – kis területű – sekély – benőtt vízfelületű – időszakos
HU	LW	N/A	Small	5L	szikes – kis területű – sekély – nyílt vízfelületű – időszakos
HU	LW	N/A	Small	6L	szikes – kis területű – sekély – benőtt vízfelületű – állandó
HU	LW	N/A	Small	7L	szikes – kis területű – sekély – nyílt vízfelületű – állandó
HU	LW	N/A	Medium	8L	szikes – közepes területű – sekély – nyílt vízfelületű – állandó
HU	LW	N/A	N/A	99L	mesterséges
HU	LW	N/A	Large	9L	szikes – nagy területű – sekély – nyílt vízfelületű – állandó
HU	RW	Mid-altitude	Large	10R	dombvidéki – meszes – közepes-finom – nagy vízgyűjtő
HU	RW	Lowland	Small	11R	síkvidéki – meszes – durva – kicsi vízgyűjtő
HU	RW	Lowland	Medium	12R	síkvidéki – meszes – durva – közepes vízgyűjtő
HU	RW	Lowland	Large	13R	síkvidéki – meszes – durva – nagy vízgyűjtő
HU	RW	Lowland	Very large	14R	síkvidéki – meszes – durva – nagyon nagy vízgyűjtő
HU	RW	Lowland	Small	15R	síkvidéki – meszes – közepes-finom – kicsi vízgyűjtő
HU	RW	Lowland	Small	16R	síkvidéki – meszes – közepes-finom – kicsi és kis esésű vízgyűjtő
HU	RW	Lowland	Medium	17R	síkvidéki – meszes – közepes-finom – közepes és kis esésű vízgyűjtő
HU	RW	Lowland	Medium	18R	síkvidéki – meszes – közepes-finom – közepes vízgyűjtő
HU	RW	Lowland	Large	19R	síkvidéki – meszes – közepes-finom – nagy vízgyűjtő
HU	RW	Highland	Small	1R	hegyvidéki – szilikátos – durva – kicsi vízgyűjtő
HU	RW	Lowland	Very large	20R	síkvidéki – meszes – közepes-finom – nagyon nagy vízgyűjtő

Country	Water Category Code	Broad Altitude Type	Size	TYPE_CODE	TYPE_NAME
HU	RW	Lowland	Small	21R	síkvidéki – szerves – kicsi vízgyűjtő
HU	RW	Lowland	Medium	22R	síkvidéki – szerves – közepes vízgyűjtő
HU	RW	N/A	N/A	23R	Duna Gönyű felett
HU	RW	N/A	N/A	24R	Duna Gönyű és Baja között
HU	RW	N/A	N/A	25R	Duna Baja alatt
HU	RW	Highland	Small	2R	hegyvidéki – meszes – durva – kicsi vízgyűjtő
HU	RW	Highland	Medium	3R	hegyvidéki – meszes – durva – közepes vízgyűjtő
HU	RW	Mid-altitude	Small	4R	dombvidéki – meszes – durva – kicsi vízgyűjtő
HU	RW	Mid-altitude	Medium	5R	dombvidéki – meszes – durva – közepes vízgyűjtő
HU	RW	Mid-altitude	Large	6R	dombvidéki – meszes – durva – nagy vízgyűjtő
HU	RW	Mid-altitude	Very large	7R	dombvidéki – meszes – durva – nagyon nagy vízgyűjtő
HU	RW	Mid-altitude	Small	8R	dombvidéki – meszes – közepes-finom – kicsi vízgyűjtő
HU	RW	N/A	N/A	99R	mesterséges
HU	RW	Mid-altitude	Medium	9R	dombvidéki – meszes – közepes-finom – közepes vízgyűjtő

Annex 8 Links between pressure types and freshwater habitats in Hungary

Habitat code	Pressure code	Pressure type
3130	100	Cultivation
3130	110	Use of pesticides
3130	162	Artificial planting
3130	300	Sand and gravel extraction
3130	800	Landfill, land reclamation and drying out, general
3130	810	Drainage
3130	820	Removal of sediments (mud...)
3130	954	Invasion by a species
3150	400	Urbanised areas, human habitation
3150	701	Water pollution
3150	820	Removal of sediments (mud...)
3150	870	Dykes, embankments, artificial beaches, general
3150	954	Invasion by a species
3160	300	Sand and gravel extraction
3160	310	Peat extraction
3160	701	Water pollution
3160	800	Landfill, land reclamation and drying out, general
3160	820	Removal of sediments (mud...)
3160	951	Drying out / accumulation of organic material
3160	952	Eutrophication
3160	976	Damage by game species
3260	164	Forestry clearance
3260	190	Agriculture and forestry activities not referred to above
3260	701	Water pollution
3260	820	Removal of sediments (mud...)
3260	870	Dykes, embankments, artificial beaches, general
3270	300	Sand and gravel extraction
3270	520	Shipping
3270	811	Management of aquatic and bank vegetation for drainage purposes
3270	820	Removal of sediments (mud...)
3270	853	Management of water levels
3270	860	Dumping, depositing of dredged deposits
3270	870	Dykes, embankments, artificial beaches, general
3270	954	Invasion by a species

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