

## ANNEX 2

### Information on the Monitoring Programmes of the Member States

#### PRELIMINARY REMARKS

This Annex provides a summary of the information provided by each Member State on the establishment of monitoring programmes for surface waters and groundwater in accordance with Article 8 and Annex V WFD. These Member State Annexes follow the same outline. The information below explains the approach taken.

#### GENERAL COMMENTS

Throughout the Annex, a dash '-' in a table means 'not applicable' or 'not relevant'.

The following acronyms have been used in the tables:

Surv: surveillance monitoring

Op: operational monitoring

Quant: quantitative monitoring

#### INFORMATION SUPPLIED

This section gives information on the kind of report provided by the Member State (electronic or paper report), if it was provided in the agreed format, and whether any additional information (reports, links to reports or general web pages) were given. In case reports were uploaded in the Central Data Repository (CDR) or direct links to documents were provided, these were taken into account in the assessment, but in case only general web pages, e.g. on the implementation of the WFD were given, these were not searched exhaustively.

#### FACTS AND FIGURES

This section presents 1) a list of the river basin districts and the number of water bodies, 2) the number of surveillance and operational monitoring stations, as well as the number for quantitative monitoring of groundwater, 3) the number of monitoring stations in protected areas reported under the WFD, and 4) maps showing the locations of surface water and groundwater monitoring stations.

The numbers of the *water bodies* were initially taken from the 2005 reports on Article 5 WFD and were then consulted with the Member States in January 2009. The updated number of water bodies was integrated in the calculation of the indicators that are presented in this report.

The numbers of *monitoring stations* reported under Article 8 WFD were also consulted with the Member States and some of them reported changes. Therefore, the numbers of monitoring stations given in the table in the Annex may not correspond with the information reported in WISE which is the one used for the calculation of indicators. Therefore, there may be some (minor) differences in the numbers provided in tables and figures of the main report and those in the Annex.

The numbers of monitoring stations in *protected areas* shown in the Annex are only those that were reported under the Water Framework Directive. The reporting of monitoring of protected areas under the Water Framework Directive was requested only if the information was not reported under other directives. The Bathing Directive 76/160/EEC and the Nitrates Directive 91/676/EEC both require reporting on monitoring stations. In addition, Directive 91/692/EEC on Standardised Reporting includes the reporting of monitoring stations for the Shellfish Directive (79/923/EEC codified by 2006/113/EC) and Fish Directive (78/659/EEC codified by 2006/44/EC).

The Habitats Directive 92/43/EEC and the Birds Directive 79/409/EEC do not include obligations concerning the reporting of monitoring stations in water. Similarly, the Drinking Water Directive 98/83/EC only requires monitoring at the tap, but no monitoring of surface water or groundwater.

If a Member State has established and applies action programmes in the whole of its territory, then, in accordance to Article 3.5 of the Nitrates Directive 1991/676/EEC, it is exempted from designation of specific vulnerable zones. If a Member State applies more stringent waste water treatment in the whole of its territory, then, in accordance to Article 5.8 of the Urban Waste Water Directive 1991/271/EEC, it is exempted from designation of specific sensitive areas. In those cases it is not relevant to talk about monitoring in protected areas as there is no obligation to designate specific zones.

For these reasons the numbers on monitoring stations of protected areas given in the Annex may not be identical with those reported under other Directives. In the respective table, a dash ("-") means "not applicable". No information (empty cell) means "no information has been reported under the WFD".

## **SURFACE WATER MONITORING PROGRAMMES**

### Design of Monitoring Programmes

The analysis has relied on the information reported into WISE and any other report provided as referenced in the "Information supplied" section. General statements about the criteria used for the design of the monitoring programmes have not been thoroughly checked, in part because the lack of supporting information that would be necessary to make an in-depth analysis. In particular, the WFD Article 5 pressure and impact analysis was carried out in 2004 and reported to the Commission in 2005. This analysis is one of the main elements that drive the design of the monitoring programmes. Many Member States have, since 2005, updated the analysis and this information will be reported to the Commission in March 2010 together with the river basin management plans. In 2010 also the status information will be reported, which is the main result the monitoring programmes have to deliver. It is only then that the Commission will have the whole picture and will be able to make a more in-depth analysis (see **Figure 3** 'General approach to compliance checking' in the main report).

### Development of Biological Assessment Methods

The assessment presented here is based on the information reported under Article 8 WFD. This may not reflect the actual status of development of the methods in case the Member States have not reported complete information. In order to complement the information presented in this section, a note has been added to the table in those cases where the methods are not yet fully developed or where the information was incomplete, i.e. the cells are not green. The note provides a short overview of the results of the intercalibration exercise for the relevant country (Commission Decision 2008/915/EC). The cases in which the national

assessment systems for particular quality elements have been intercalibrated but they appear "under development" or "not developed" in the table may likely be due to an incomplete reporting.

A number of charts are provided presenting the number of stations in which the various quality elements are monitored. These charts are based on all types of stations (i.e. surveillance and operational). The legend of the charts is the following:

Phyto-p:	phytoplankton
Macro-p and phyto-b:	Macrophytes and phytobenthos
Benthic inv:	Benthic invertebrates
River cont:	river continuity
Morph conds:	morphological conditions
Gen para:	general physico-chemical conditions
Priority Subs:	priority substances
Non-priority poll:	non-priority pollutants
Other poll:	other pollutants
Macro-a and angio:	Macroalgae and angiosperms
Hydromorph:	Hydromorphological parameters in general

#### **GROUNDWATER MONITORING PROGRAMMES**

The same comments apply as for the surface water assessment. Statements about the criteria used in the design of the network have not been thoroughly checked.

#### **FURTHER INFORMATION**

The weblinks provided in WISE to further information are given in this section.

#### **SUMMARY OF TECHNICAL ASSESSMENT: STRENGTHS AND WEAKNESSES**

A brief summary of strengths and weaknesses found is given in this section.

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**Member State: AUSTRIA**

**INFORMATION SUPPLIED**

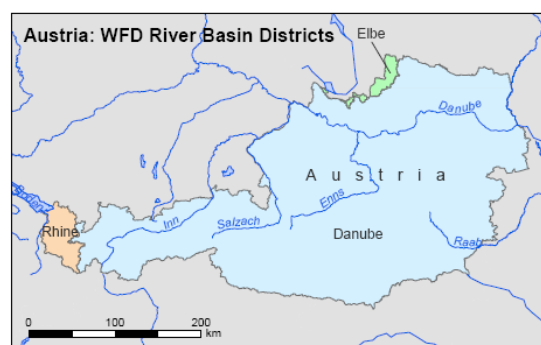
Austria timely provided information in WISE in the agreed format on monitoring programmes and stations for three Austrian river basin districts (Danube, Rhine and Elbe) and weblinks for additional information.

**FACTS AND FIGURES**

Austria has a population of 8.3 million (Eurostat, 2007) and an area of 83,851 km<sup>2</sup>.

Austria is situated in three international river basins: Danube, Rhine and Elbe.

Austria has no transitional or coastal waters.



**River basin districts and number of water bodies**

River Basin District	Surface (km <sup>2</sup> )	% National territory	Number of river water bodies	Number of lake water bodies	Number of transitional water bodies	Number of coastal water bodies	Number of groundwater bodies
Danube	80565	96	863	55	-	-	128
Rhine	2365	3	57	5	-	-	7
Elbe	921	1	20	2	-	-	1
<b>Austria</b>	<b>83851</b>	<b>100</b>	<b>940</b>	<b>62</b>	<b>-</b>	<b>-</b>	<b>136</b>

**Note:** the number of river water bodies shown in the table covers only those with catchments larger than 100 km<sup>2</sup>. According to the communication from the Austrian authorities, there are ca. 5000 water bodies with catchments smaller than 100 km<sup>2</sup> that will be reported in the river basin management plans.

**Number of surveillance, operational and quantitative monitoring stations**

River Basin District	Rivers		Lakes		Transitional waters		Coastal waters		Groundwaters		
	Surv	Op	Surv	Op	Surv	Op	Surv	Op	Surv	Op	Quant
Danube	69	451	32	1	-	-	-	-	1926	247	3050
Rhine	7	32	1	0	-	-	-	-	72	0	302
Elbe	0	14	0	0	-	-	-	-	14	0	7
<b>Total</b>	<b>76</b>	<b>497</b>	<b>33</b>	<b>1</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>2012</b>	<b>247</b>	<b>3359</b>
<b>Total number of monitoring stations</b>	<b>550</b>		<b>33</b>		<b>-</b>		<b>-</b>		<b>2012</b>		<b>3359</b>

**Notes:**

- the river monitoring stations shown in the table are located in water bodies with catchments larger than 100 km<sup>2</sup>. According to the communication from the Austrian authorities, monitoring of smaller water bodies will add around 1500 additional operational monitoring stations (to be reported in the river basin management plans).
- total number of monitoring stations is not necessarily the sum of surveillance and operational as there are stations that serve both purposes

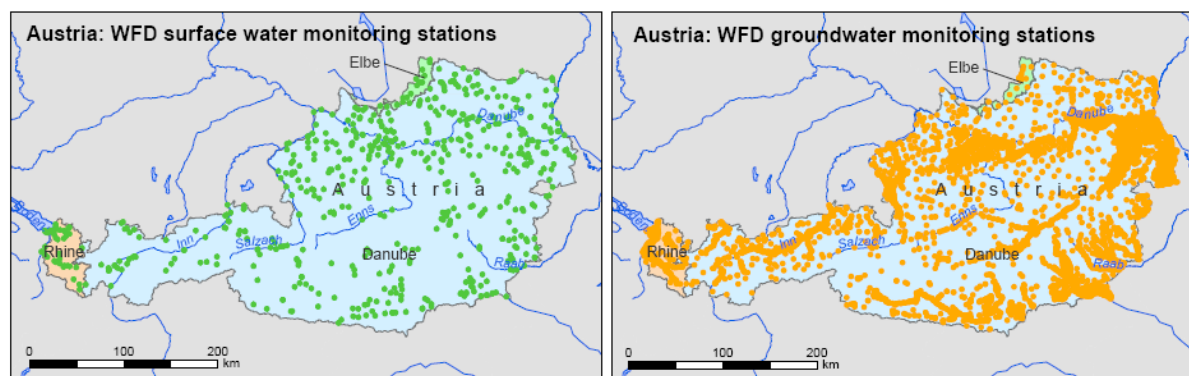
### Number of monitoring stations in protected areas reported under the WFD

River Basin District	Surface water							Ground water
	Bathing water	Habitats / Birds	Drinking water	Fish	Shellfish	Nitrates	Urban waste water	Drinking water
Danube	32	100	44	127	-	-	-	
Rhine	1	3	5	22	-	-	-	
Elbe		2			-	-	-	
<b>Total</b>	<b>33</b>	<b>105</b>	<b>49</b>	<b>149</b>	<b>-</b>	<b>-</b>	<b>-</b>	

#### Notes:

- the reporting of monitoring of protected areas under the Water Framework Directive was due only if the information was not reported under other directives. 268 surface water monitoring stations were reported under the bathing water directive (bathing season 2007). Those figures are preliminary as quality checking is on-going at the time this report is written.
- Austria has established and applies action programmes in the whole of its territory and therefore, in accordance to article 3.5 of the Nitrates Directive 1991/676/EEC, it is exempted from designation of specific vulnerable zones. A total of 312 surface water monitoring stations for nitrates have been reported by Austria under the nitrates Directive in 2008 (reference period 2004-2007).
- Austria applies more stringent waste water treatment in the whole of its territory and therefore, in accordance to article 5.8 of the Urban Waste Water Directive 1991/271/EEC, it is exempted from designation of specific sensitive areas.

### Location of surface water and groundwater monitoring stations



## SURFACE WATER MONITORING PROGRAMMES

### Design of Monitoring Programmes

Austria has established surveillance, operational and investigative monitoring programmes. There are specific sub-programmes designed for the surveillance and operational monitoring of rivers and lakes.

*Surveillance monitoring* is carried out in the first year of the 6-year monitoring cycle. Except for the reference sites, the surveillance monitoring is repeated during the following 5 years for a selection of quality elements (e.g. priority substances are not monitored in all stations in rivers and macrophytes and fish are not monitored in lakes). The surveillance monitoring stations cover more than 90% of the country water resources. Monitoring stations in rivers are selected on the following criteria: water bodies with catchment areas larger than 1000 km<sup>2</sup>, transboundary water bodies, water bodies representative of typical uses in the river basin districts and reference sites. In the case of lakes, significant water bodies larger than 1 km<sup>2</sup> are

selected which are representative of the various types present in the river basin district and of the typical range of uses. In addition, reference lakes are also monitored.

*Operational monitoring* covers rivers with catchments larger than 100 km<sup>2</sup>. Monitoring of river water bodies with catchments smaller than 100 km<sup>2</sup> is foreseen to start only in December 2010 and has not been reported (the description of this monitoring will be included in the river basin management plans). The Austrian authorities estimate that the operational monitoring of small river water bodies will consist of an additional 1500 stations. As regards lakes, operational monitoring covers one lake in the Danube river basin district. The selection of monitoring stations is driven by the 2004 pressure and impact analysis.

For *investigative monitoring* Austria is participating in pollution detection systems under bi- and multilateral water conventions. Warning and information systems for cross regional incidents have been installed which would allow following any incident.

In Austria drinking water is abstracted only from groundwater. Therefore no special monitoring for surface *drinking water protected areas* is required according to the report.

Austria is situated in three international river basins: Danube (96% of Austrian territory), Rhine (3%) and Elbe (1%). The *international coordination* of the programmes for the river basins is carried out by bi-lateral commissions and the international river commissions ICPDR (Danube), ICPR (Rhine) and ICPEL (Elbe).

Austria has coordinated the monitoring programmes for the Danube with the following neighbouring countries: Germany, Czech Republic, Slovakia, Hungary and Slovenia.

#### Development of Biological Assessment Methods

The reports provide complete information on the methods for the assessment of biological quality elements except for phytoplankton in rivers and macroinvertebrates in lakes. The report<sup>1</sup> justifies the lack of method for phytoplankton in rivers on the grounds that very little autochthonous phytoplankton is produced in Austrian rivers. For large rivers (Danube, March, Thaya) the development of a method is under discussion. As regards lakes, the report states that the assessment of macroinvertebrates does not add any useful information to that collected through other quality elements.

Qualitative information is provided on the expected level of confidence.

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<sup>1</sup> "Leitfaden zur Erhebung der biologischen Qualitätselemente – Einleitung" page 15 (<http://wasser.lebensministerium.at/article/articleview/52972/1/5659/>)

Summary of available biological assessment methods

	Rivers				Lakes				Transitional Waters				Coastal Waters		
	Phytoplankton	Macrophytes and Phytobenthos	Benthic invertebrates	Fish	Phytoplankton	Macrophytes and Phytobenthos	Benthic invertebrates	Fish	Phytoplankton	Macroalgae and Angiosperms	Benthic invertebrates	Fish	Phytoplankton	Macroalgae and Angiosperms	Benthic invertebrates
Austria	■	■	■	■	■	■	■	■	-	-	-	-	-	-	-

*Method available* ■ *Under development or incomplete information* ■ *Not developed or no information* ■ *Not relevant* -

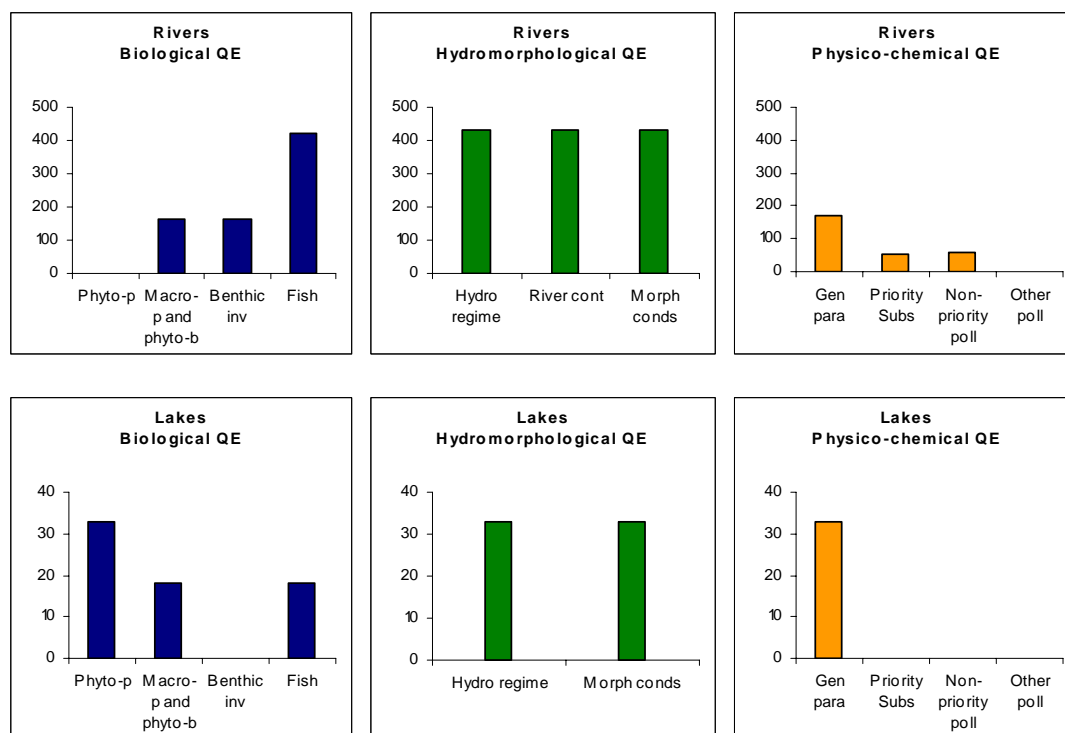
**Note:** In the context of the WFD intercalibration exercise, Austria has intercalibrated national methods for a range of biological quality elements (see Commission Decision 2008/915/EC of 30 October 2008 establishing, pursuant to Directive 2000/60/EC of the European Parliament and of the Council, the values of the Member State monitoring system classifications as a result of the intercalibration exercise, available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:332:0020:0044:EN:PDF>).

Selection of Quality Elements and Frequency of Monitoring

All quality elements are monitored in surveillance monitoring in rivers except phytoplankton. As regards lakes, all quality elements except macroinvertebrates are monitored. Priority substances are not monitored in lakes as they are not discharged.

The monitoring *frequency* of the surveillance monitoring of rivers and lakes is higher than the minimum required by the Water Framework Directive. For operational monitoring, frequencies are higher than the minimum included in the Water Framework Directive in the case of physico-chemical parameters in rivers and phytoplankton in lakes.

### Number of stations where quality elements are monitored (surveillance and operational monitoring) in rivers, lakes, transitional and coastal waters



## GROUNDWATER MONITORING PROGRAMMES

### Design of Monitoring Programmes

There are programmes identified for quantitative, surveillance and operational monitoring in Austria.

The report refers to 3 sub-programmes (manual monitoring; automated monitoring and automated monitoring of springs) for *quantitative assessment* in Austria. For each programme, the report lists some general criteria for the selection of sites for quantitative assessment of groundwater such as geology, hydrogeology, the groundwater/surface water interactions, climate, land uses, etc.

The report refers to 2 sub-programmes for *surveillance monitoring* in Austria; one is an initial surveillance monitoring which will take place in 2007 and another repetitive surveillance monitoring which will be in operation between 2008 and 2012. According to the description of the methodology in the report the results from the 2004 pressure and impact analysis were taken into account in the selection of surveillance monitoring sites.

The repetitive surveillance sub-programme for groundwater is reported to addresses long term anthropogenic trends and potential increase of contaminants.

There are *operational monitoring* programmes for groundwater bodies identified at risk by the 2004 analysis, the report describes the methodology for selecting sites for the operational network. There is no site selected for operational monitoring in the Rhine and the Elbe river basin districts for the moment.

The repetitive monitoring of the surveillance monitoring and the operational monitoring start at 22/12/2007 following the results of the initial surveillance monitoring.

The report mentions that the groundwater abstraction wells are monitored according the EU drinking water Directive. The report does not provide information on the monitoring stations that are associated with *protected area for drinking water*.

The report does not explicitly mention that cross-border water bodies are included in the network, but it mentions that international coordination has taken place in the design of the monitoring network.

### Selection of Quality Elements and Frequency of Monitoring

The report lists all core *parameters*: groundwater level and temperature, groundwater yield, oxygen content, pH value, conductivity, nitrate, ammonium. Other pollutants are also mentioned.

As regards *frequency* of groundwater monitoring, it is reported to be carried out every year for the first cycle with a monthly frequency for manual stations or daily in stations with automatic logger.

The initial surveillance monitoring is carried out for one year, 4 times for core parameters and twice for other pollutants. The repetitive surveillance monitoring is carried out twice every year for core parameters and once every year for other pollutants.

For operational monitoring of the Elbe and the Rhine, the monitoring frequency is not reported, because there is no operational monitoring foreseen at the moment. For the Danube the operational monitoring will be carried out every year for the first cycle.

### **FURTHER INFORMATION**

<http://wisa.lebensministerium.at/article/archive/18247>

<http://wasser.lebensministerium.at/article/articleview/52972/1/5659>

### **SUMMARY OF TECHNICAL ASSESSMENT: STRENGTHS AND WEAKNESSES**

- + Clear concept for developing the monitoring programmes following WFD requirements
- + The report is clear and of very good quality
- + International coordination
- Monitoring of water bodies with catchment areas smaller than 100 km<sup>2</sup> starts only in 2010

**Member State: BELGIUM****INFORMATION SUPPLIED**

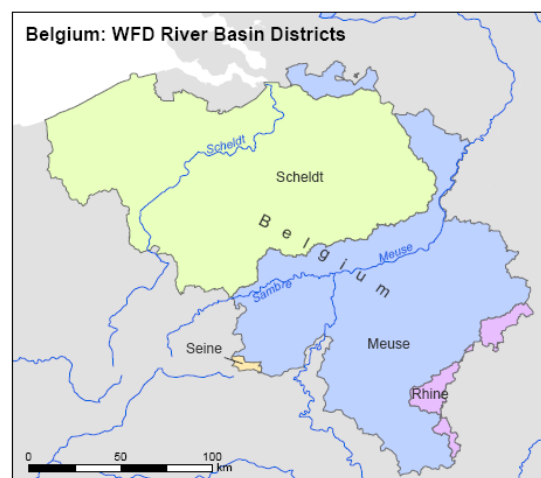
Belgium has reported through WISE for its four river basin districts. Information was supplied separately for the seven regional parts of the river basin districts plus an additional report on coastal waters for the Scheldt river basin district.

In Belgium, the three regions (Brussels, Flanders, and Wallonia) have responsibility for managing the surface waters and the groundwater on their territory. In addition, the Federal Government has responsibility for coastal waters (located only in the Scheldt river basin district). The Scheldt river basin district is shared between the 3 regions and the Federal Government, with Brussels covering only a very small part (only 3 water bodies). The Meuse river basin district is shared by the Flemish and the Walloon Region. The Rhine and the Seine river basin districts only cover territory in the Walloon Region. The CCIM (Coordination Committee International Environmental Policy) is the consultative body that is in charge of the necessary coordination of the implementation of the WFD between the different competent authorities in Belgium. In addition, the regions coordinate the implementation of the WFD in the context of the international conventions for the Meuse and the Scheldt rivers. The following report was submitted which also explains in more detail the administrative arrangements in Belgium:

- Monitoring Programmes for the Belgian Coastal Waters (undated)

**FACTS AND FIGURES**

Belgium has a population of 10.6 million (Eurostat, 2007) and an area of 30,735 km<sup>2</sup>. Belgium is situated in four international river basins: Scheldt, Meuse, Rhine and Seine.



**River basin districts and number of water bodies**

River District	Basin	Surface (km <sup>2</sup> )	% National territory	Number of river water bodies	Number of lake water bodies	Number of transitional water bodies	Number of coastal water bodies	Number of groundwater bodies
Scheldt								
o	Flemish region	11991	39	156	14	11	-	32
o	Walloon region	3745	12	79	-	-	-	10
o	Brussels region	162	0.5	3	-	-	-	5
o	Coastal waters	137	0.5	-	-	-	1	-
Meuse								
o	Walloon region	12255	40	257	-	-	-	21
o	Flemish region	1596	5	17	3	-	-	10
Rhine		769	2.5	16	-	-	-	2
Seine		80	0.3	2	-	-	-	0
<b>Belgium</b>		<b>30735</b>	<b>100</b>	<b>530</b>	<b>17</b>	<b>11</b>	<b>1</b>	<b>80</b>

**Number of surveillance, operational and quantitative monitoring stations**

River Basin District	Rivers		Lakes		Transitional waters		Coastal waters		Groundwaters			
	Surv	Op	Surv	Op	Surv	Op	Surv	Op	Surv	Op	Quant	
Scheldt												
o	Flemish region	58	364	8	28	14	28	-	-	32	32	32
o	Walloon region	14	86	-	-	-	-	-	-	146	39	83
o	Brussels region	9	5	-	-	-	-	-	-	12	10	46
o	Coastal waters	-	-	-	-	-	-	4	5	-	-	-
Meuse												
o	Walloon region	36	172	-	-	-	-	-	-	241	47	114
o	Flemish region	6	38	2	8	-	-	-	-	10	10	10
Rhine		3	7	-	-	-	-	-	-	13	2	3
Seine		1	1	-	-	-	-	-	-	-	-	-
<b>Total</b>		<b>127</b>	<b>673</b>	<b>10</b>	<b>36</b>	<b>14</b>	<b>28</b>	<b>4</b>	<b>5</b>	<b>454</b>	<b>140</b>	<b>288</b>
<b>Total number of monitoring stations</b>		<b>691</b>		<b>36</b>		<b>28</b>		<b>5</b>		<b>464</b>		<b>288</b>

**Note:** total number of monitoring stations is not necessarily the sum of surveillance and operational as there are stations that serve both purposes.

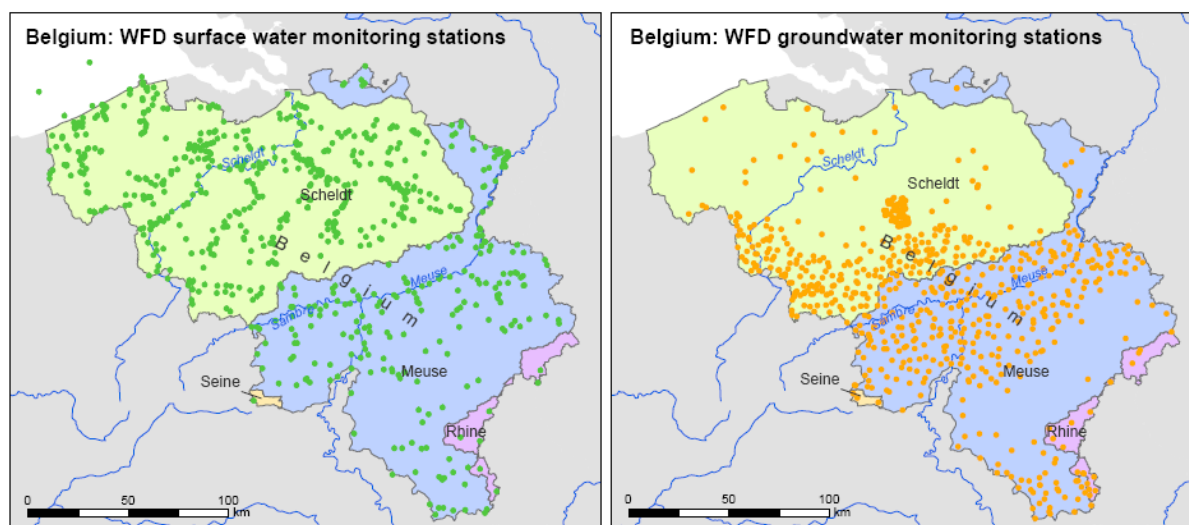
Number of monitoring stations in protected areas reported under the WFD

River Basin District	Surface water							Ground water
	Bathing water	Habitats / Birds	Drinking water	Fish	Shellfish	Nitrates	Urban waste water	Drinking water
Scheldt								
o Flemish region			4				-	
o Walloon region		22		2		89	-	82
o Brussels region							-	
o coastal waters		3					-	
Meuse								
o Walloon region		131		62		58	-	130
o Flemish region							-	
Rhine		6		2			-	9
Seine		2		1			-	
<b>Total</b>		<b>161</b>	<b>4</b>	<b>67</b>		<b>147</b>	<b>-</b>	<b>221</b>

Notes:

- The reporting of monitoring of protected areas under the Water Framework Directive was due only if the information was not reported under other directives. A total of 116 and 1402 surface water monitoring stations for bathing water and nitrates respectively have been reported by Belgium under the bathing water and nitrates Directives in 2008 (figures are preliminary, quality checking on-going at the time this report is written).
- Belgium applies more stringent waste water treatment in the whole of its territory and therefore, in accordance to article 5.8 of the Urban Waste Water Directive 1991/271/EEC, it is exempted from designation of specific sensitive areas.

Location of surface water and groundwater monitoring stations



SURFACE WATER MONITORING PROGRAMMES

Design of Monitoring Programmes

There are some differences in the reporting and in the approaches taken by the 4 regional competent authorities.

Each region has established separate sub-programmes for *surveillance* and for *operational monitoring* for their relevant water categories: the Brussels and Walloon regions each have 2 sub-programmes for rivers; the Flemish region has 2 sub-programmes for each of the three

relevant water categories - rivers, lakes and transitional waters. Sub-programmes for coastal waters have been set up at the federal level. All reports refer to the design criteria in Annex V of the WFD.

At the time of reporting, none of the regions was planning an *investigative monitoring* programme. Wallonia provided general information on the strategy for developing investigative monitoring.

*Monitoring of protected areas* is incorporated in sub-programmes in Wallonia and for coastal waters. In Brussels, none of the three monitoring stations are located in protected areas. Flanders did not provide any information on the Meuse river basin district, but for the Scheldt four stations were reported to be located in a drinking water protection area.

Monitoring under *other EU Directives or voluntary agreements* is only incorporated in monitoring sub-programmes in Wallonia, specifically for the Birds, the Habitats, the Nitrates, the Urban Wastewater and the Fish Water Directives. For coastal waters monitoring is linked with the monitoring programmes under OSPAR. Wallonia and Flanders reported to have included monitoring stations of EIONET-Water.

*International co-ordination* is reported to be taking place in all river basin districts, although the information is insufficient for the Flemish region. For coastal waters in the Scheldt river basin district international coordination takes place through the International Scheldt Commission and in the framework of the OSPAR Convention.

#### Development of Biological Assessment Methods

For the Walloon region, the WISE reporting does not include information on the sampling and analytical methods for any of the quality elements and the direct hyperlinks to the monitoring report do not work. A report was found in the WFD web page of the Walloon Region, though (see the section "Further information" below). In that report the methods for biological assessment are referenced. For Brussels, the report makes reference to methods developed by the Free University of Brussels but no information is provided. For the Flemish region, the methods were reported for almost all biological quality elements with the exception of the method for macroalgae in transitional waters. For the coastal waters, all biological methods are available with the exception of the methods for macroalgae and angiosperms.

The information given on *confidence and precision* is very limited.

Summary of available biological assessment methods

	Rivers				Lakes				Transitional Waters				Coastal Waters		
	Phytoplankton	Macrophytes and Phytobenthos	Benthic invertebrates	Fish	Phytoplankton	Macrophytes and Phytobenthos	Benthic invertebrates	Fish	Phytoplankton	Macroalgae and Angiosperms	Benthic invertebrates	Fish	Phytoplankton	Macroalgae and Angiosperms	Benthic invertebrates
Scheldt															
o Flemish region	■	■	■	■	■	■	■	■	■	■	■	■	-	-	-
o Walloon region	■	■	■	■	-	-	-	-	-	-	-	-	-	-	-
o Brussels region	■	■	■	■	-	-	-	-	-	-	-	-	-	-	-
o coastal waters	-	-	-	-	-	-	-	-	-	-	-	-	■	■	■
Meuse															
o Walloon region	■	■	■	■	-	-	-	-	-	-	-	-	-	-	-
o Flemish region	■	■	■	■	■	■	■	■	-	-	-	-	-	-	-
Rhine	■	■	■	■	-	-	-	-	-	-	-	-	-	-	-
Seine	■	■	■	■	-	-	-	-	-	-	-	-	-	-	-

Method available ■ Under development or incomplete information ■ Not developed or no information ■ Not relevant -

**Note:** In the context of the WFD intercalibration exercise, Belgium has intercalibrated national methods for a range of biological quality elements (see Commission Decision 2008/915/EC of 30 October 2008 establishing, pursuant to Directive 2000/60/EC of the European Parliament and of the Council, the values of the Member State monitoring system classifications as a result of the intercalibration exercise, available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:332:0020:0044:EN:PDF>).

Selection of Quality Elements and Frequency of Monitoring

The *selection of biological quality elements* used for surveillance monitoring in rivers is the same across the three regions. The selection is fairly comprehensive and covers most of the quality elements recommended in the Directive with the exception of phytoplankton, which is not monitored in the Walloon Region.

For lakes (which are only present in the Flemish part of the Scheldt river basin district), all quality elements are monitored except priority substances and other specific pollutants.

For transitional waters (which are only present in the Flemish part of the Scheldt river basin district) all quality elements are monitored, except macroalgae.

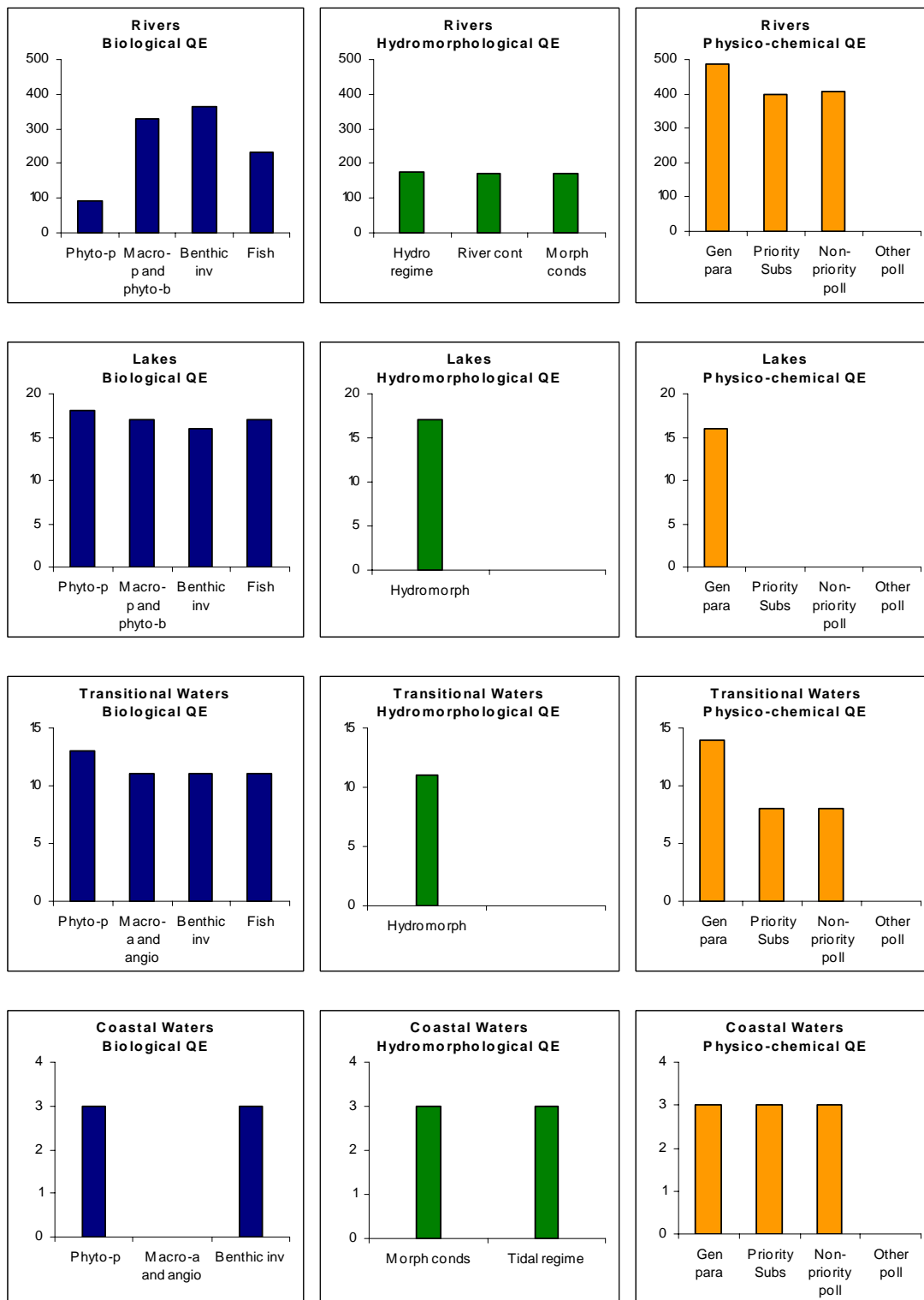
For coastal waters (which are only present in the Scheldt river basin district) the biological elements macroalgae and angiosperms are missing.

For operational monitoring, all reports indicate that there is a targeted approach in selecting the various quality elements depending on the pressures to which the water body is subject.

The *frequency* of surveillance monitoring for biological quality elements varies across the three regions. In the Flemish part the surveillance monitoring programmes will be carried out once every 6 years which is equivalent to the minimum frequency specified in the WFD. In the Walloon region and in Brussels, the monitoring frequency for biological quality elements is reported to be carried out every three years.

The frequency of operational monitoring for biological elements is the same for the Flemish and Brussels region and will be monitored every three years. In the Walloon region monitoring will be carried out the first year and the frequency will be decided subsequently depending on the results. For coastal waters, operational monitoring will be carried out once every year for the first river basin management cycle for benthic invertebrates and 12 times per year for phytoplankton.

Number of stations where quality elements are monitored (surveillance and operational monitoring) in rivers, lakes, transitional and coastal waters



## GROUNDWATER MONITORING PROGRAMMES

### Design of Monitoring Programmes

In the Walloon region, there is no specific groundwater monitoring programme for the Seine river basin district due to its small size; instead, the groundwater monitoring programme is integrated in the Meuse monitoring programme. There are differences in the reporting and in the approaches taken by the relevant responsible authorities.

All 3 regions have established programmes for the *quantitative, surveillance and the operational monitoring of groundwater*. The reports are clearly focussed on operational monitoring of groundwater bodies at risk, but are less clear if they are designed to assess upward pollution trends.

Information on *additional monitoring in protected areas* for drinking water abstraction is available in Wallonia and Flanders. Wallonia also supplied the number of protected drinking water abstraction areas. There are no drinking water protection areas in Brussels.

Information on other monitoring networks linked to *other EU Directives or international obligations* is only given in the Walloon report for monitoring of transboundary groundwater bodies. In the Flemish and in the Brussels report only general comments are given.

### Selection of Quality Elements and Frequency of Monitoring

For surveillance monitoring, all reports across the 3 regions indicate that the monitoring programmes are comprehensive and that *all parameters* are covered. For operational monitoring, all reports across the 3 regions indicate that although there are no specific sub-programmes addressing specific pressures, there is a targeted approach in selecting the various quality elements depending on the pressures to which the water body is subject.

The indicated *frequency* of monitoring for quantitative monitoring is once per year except in Flanders, which is not yet decided. The indicated frequency for chemical surveillance monitoring varies across the regions: once per year for the Brussels region, every three years for Wallonia and not yet decided for the Flemish region. The indicated frequency for operational monitoring is once per year in Brussels and Flemish regions and every three years in Wallonia.

## FURTHER INFORMATION

- [http://environnement.wallonie.be/directive\\_eau/homepage.cfm?Menu=1](http://environnement.wallonie.be/directive_eau/homepage.cfm?Menu=1)  
"Mise en oeuvre de l'article 8 de la directive 2000/60/CE. Monitoring des eaux de surface. Mars 2007", available at  
[http://environnement.wallonie.be/directive\\_eau/pg/4/esu/psesu.pdf](http://environnement.wallonie.be/directive_eau/pg/4/esu/psesu.pdf)
- Federale Overheidsdienst, Volksgezondheid, Veiligheid van de Voedselketen en Leefmilieu, Directoraat-generaal Leefmilieu, Mariene milieu (undated): Monitoring Programmes for the Belgian Coastal Waters, Reporting according to Art. 8 of the Water Framework Directive (2000/60/EC) – [www.health.fgov.be](http://www.health.fgov.be), available at  
[http://cdr.eionet.europa.eu/be/eu/wfdart8/envrjr8bw/WFDart8\\_BEFEED.pdf](http://cdr.eionet.europa.eu/be/eu/wfdart8/envrjr8bw/WFDart8_BEFEED.pdf)

**SUMMARY OF TECHNICAL ASSESSMENT: STRENGTHS AND WEAKNESSES**

- + Overall good availability of methods to assess ecological status, in particular in Flanders
- Reporting is not consolidated at river basin district level but separate reports for the three regions and the Federal Administration are provided
- In Flanders the frequency of monitoring of biological quality elements is the minimum in the WFD

Member State: BULGARIA

INFORMATION SUPPLIED

Bulgaria has reported through WISE in the agreed format for its four river basin districts. Additional information has been obtained by the following sources:

- National report for the implementation of the requirements of WFD Article 8.
- Excel tables with descriptions of quality elements, sampling and analysis methodologies and standards reported in WISE.

FACTS AND FIGURES

Bulgaria has a population of 7.7 million (Eurostat, 2007) and an area of 111,071 km<sup>2</sup>. Three of the four Bulgarian river basin districts are international (Danube, East Aegean and West Aegean). Bulgaria has not designated transitional waters.



River basin districts and number of water bodies

River Basin District	Surface (km <sup>2</sup> )	% National territory	Number of river water bodies	Number of lake water bodies	Number of transitional water bodies	Number of coastal water bodies	Number of groundwater bodies
Danube	42836	39	120	41	-	-	48
East Aegean	35230	32	245	61	-	-	48
Black Sea	21040	19	118	33	-	12	43
West Aegean	11965	11	116	16	-	-	39
<b>Bulgaria</b>	<b>111071</b>	<b>100</b>	<b>599</b>	<b>151</b>	<b>-</b>	<b>12</b>	<b>178</b>

Number of surveillance, operational and quantitative monitoring stations

River Basin District	Rivers		Lakes		Transitional waters		Coastal waters		Groundwaters		
	Surv	Op	Surv	Op	Surv	Op	Surv	Op	Surv	Op	Quant
Danube	92	58	41	0	-	-	-	-	48	21	86
East Aegean	43	80	16	12	-	-	-	-	38	12	41
Black Sea	26	32	12	16	-	-	7	6	66	37	63
West Aegean	27	58	5	4	-	-	-	-	33	0	34
<b>Total</b>	<b>188</b>	<b>228</b>	<b>74</b>	<b>32</b>	<b>-</b>	<b>-</b>	<b>7</b>	<b>6</b>	<b>185</b>	<b>70</b>	<b>224</b>
<b>Total number of monitoring stations</b>	<b>352</b>		<b>103</b>		<b>-</b>		<b>13</b>		<b>201</b>		<b>224</b>

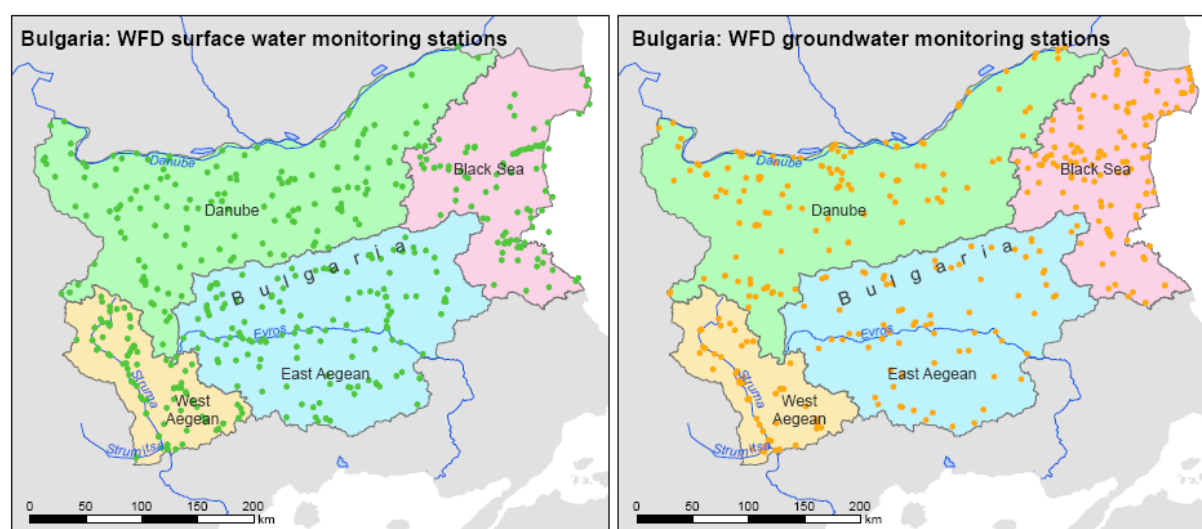
Note: Total number of monitoring stations is not necessarily the sum of surveillance and operational as there are stations that serve both purposes

**Number of monitoring stations in protected areas reported under the WFD**

River Basin District	Surface waters							Ground water
	Bathing water	Habitats / Birds	Drinking water	Fish	Shellfish	Nitrates	Urban waste water	Drinking water
Danube		41	3		-		147	45
East Aegean		87	4		-		118	38
Black Sea		73		53	3		93	68
West Aegean		60			-	23	23	19
<b>Total</b>		<b>261</b>	<b>7</b>	<b>53</b>	<b>3</b>	<b>23</b>	<b>381</b>	<b>170</b>

**Note:** the reporting of monitoring of protected areas under the Water Framework Directive was due only if the information was not reported under other directives. A total of 115 surface water monitoring stations for nitrates have been reported by Bulgaria under the nitrates Directive in 2008 (reference period 2004-2007). 93 surface water monitoring stations were reported under the bathing water directive (bathing season 2007). Those figures are preliminary as quality checking is on-going at the time this report is written.

**Location of surface water and groundwater monitoring stations**



**SURFACE WATER MONITORING PROGRAMMES**

Design of Monitoring Programmes

The approach for *surveillance and operational monitoring* is the same for the four river basin districts. Both surveillance and operational monitoring are divided into water category specific sub-programmes.

In general, the design the surveillance monitoring network follows the requirements of WFD Annex V section 1.3.1 – Criteria for surveillance monitoring.

Operational monitoring is based on the results from the risk assessment (performed in 2004). There is no operational monitoring for Lakes in the Danube RBD but all lakes are included in surveillance monitoring due to their categorisation as "possibly at risk" because of the complete lack of information as for the biological quality indicators.

Operational monitoring of some quality elements has been delayed until 2009. This delay is reported to be due to administrative problems in upgrading monitoring.

*Investigative monitoring* is reported for all the river basin districts except for the Black Sea. Information on the strategy has been provided including information on the number of occasions and sites to date.

A few surface water stations are reported to be located in *drinking water protected areas*.




In general the reports provide information whether the monitoring networks cover protected areas and monitoring under additional *legislative or voluntary agreements*. In addition, sites included in WISE-SoE network are indicated and some sites are part of the TransNational Monitoring Network under the Danube River protection convention.

### Development of Biological Assessment Methods

The information on the biological assessment methods was not delivered in the WISE submission in the agreed format but in an excel sheet and in a national report on monitoring programmes provided separately. Most of the biological assessment methods for rivers and lakes are not in place yet, except the method for benthic invertebrate in rivers and the chlorophyll in lakes. The Report states that methods should be available in 2009. In coastal waters, reference is made to methods derived in the context of the Black Sea Commission without further explanation. Although assessment methods are not developed, sampling is carried out for most of the quality elements.

#### Summary of available biological assessment methods

	Rivers				Lakes				Transitional Waters				Coastal Waters		
	Phytoplankton	Macrophytes and Phytobenthos	Benthic invertebrates	Fish	Phytoplankton	Macrophytes and Phytobenthos	Benthic invertebrates	Fish	Phytoplankton	Macroalgae and Angiosperms	Benthic invertebrates	Fish	Phytoplankton	Macroalgae and Angiosperms	Benthic invertebrates
Bulgaria	Yellow	Red	Yellow	Red	Yellow	Red	Red	Red	-	-	-	-	Yellow	Yellow	Yellow

Method available  Under development or incomplete information  Not developed or no information  Not relevant -

**Note:** In the context of the WFD intercalibration exercise, Bulgaria has intercalibrated with Romania some metrics for phytoplankton and macroinvertebrates in coastal waters, but not fully developed national assessment systems (see Commission Decision 2008/915/EC of 30 October 2008 establishing, pursuant to Directive 2000/60/EC of the European Parliament and of the Council, the values of the Member State monitoring system classifications as a result of the intercalibration exercise, available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:332:0020:0044:EN:PDF>).

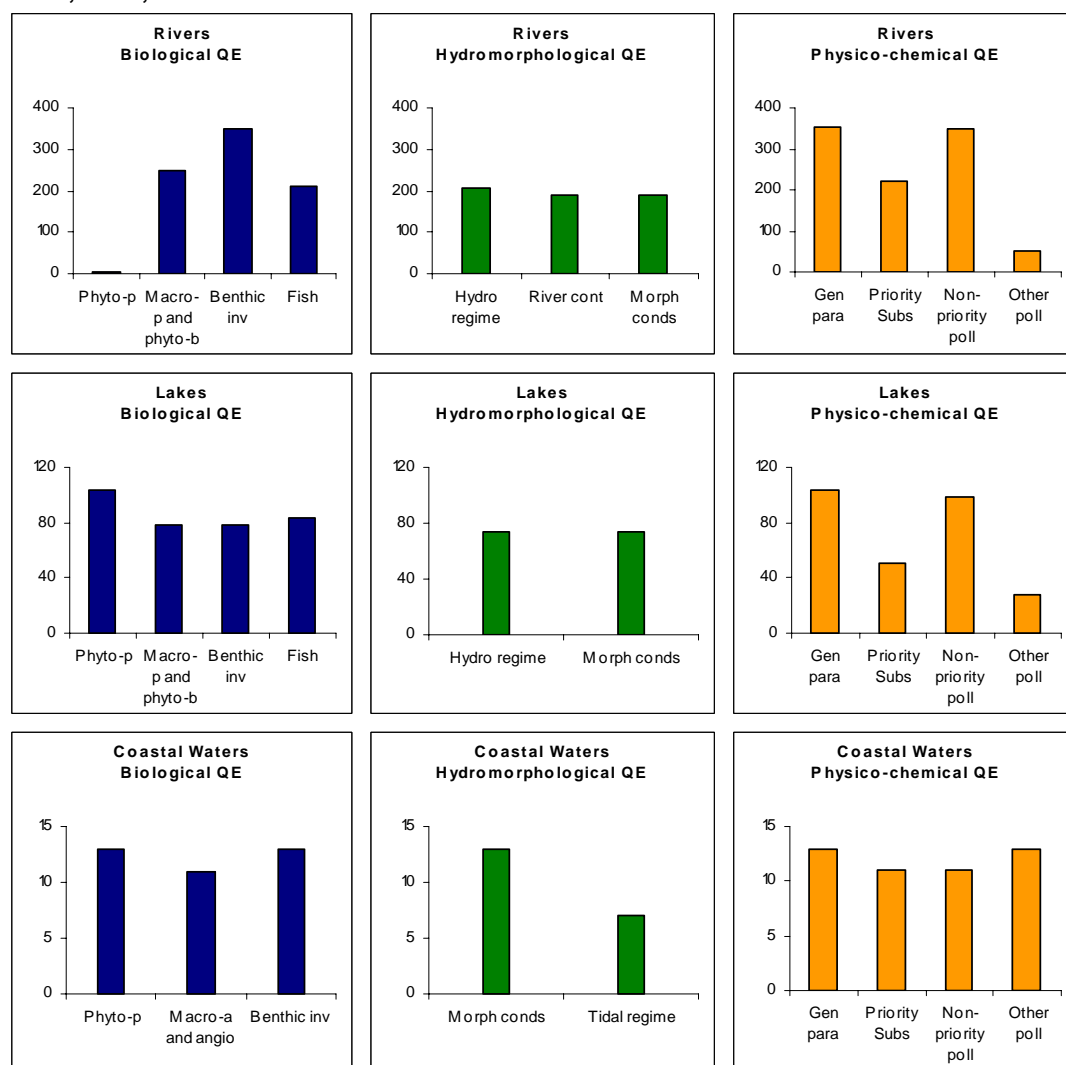
Selection of Quality Elements and Frequency of Monitoring

*Surveillance monitoring* covers all quality elements except priority substances and other specific pollutants in the Black Sea in lakes.

The selection of quality elements for the *operational monitoring* depends on the pressures to which the water body is subject.

The Report indicates that for the moment the surveillance monitoring for biological quality elements will be carried out during the first year. Further monitoring will be decided later. In general the indicated cycle of the operational monitoring for biological quality elements is once every year for the first 6 years river basin management plan cycle.

**Number of stations where quality elements are monitored (surveillance and operational monitoring) in rivers, lakes, transitional and coastal waters**



**GROUNDWATER**

Design of Monitoring Programmes

In each of the river basin districts there are specific monitoring programmes for *chemical surveillance monitoring*, *operational monitoring* and *quantitative monitoring*. In the West

Aegean river basin district there is no operational monitoring programme because there are no groundwater bodies at risk.

In the National Report is mentioned that monitoring will start later than December 2006, in July 2007, due to some administrative delays in adapting the monitoring programme.

Information is provided on monitoring stations located in *drinking water protected areas*. The report states that the results of 2004 analysis under Article 5 of the WFD have been taken into account when designing the quantitative programme.

The National Report states that in 2 river basin districts delineation of transboundary groundwaters have been coordinated with the neighbouring country. With respect to international commitments, WISE-SoE network is mentioned.

#### Selection of Quality Elements and Frequency of Monitoring

All core parameters and *parameters* indicative of identified pressures have been taken into consideration for surveillance and operational monitoring (except in West Aegean river basin district, where there are no groundwater bodies at risk).

The *frequency* for the groundwater level monitoring is once per year for the first 6 years of the cycle.

The Report indicates that for the moment the surveillance monitoring is carried out the first year only.

The frequency for operational monitoring is once per year for the first 6 years of the cycle.

#### **FURTHER INFORMATION**

No hyperlinks to additional information were reported.

Information on the analytical and sampling methods is available in excel sheet format at <http://cdr.eionet.europa.eu/bg/eu/wfdart8/envr9ayg>

#### **SUMMARY OF TECHNICAL ASSESSMENT: STRENGTHS AND WEAKNESSES**

- + Clear concept for establishing the monitoring programmes following WFD requirements
- The methods for the assessment of ecological status are not available or under development

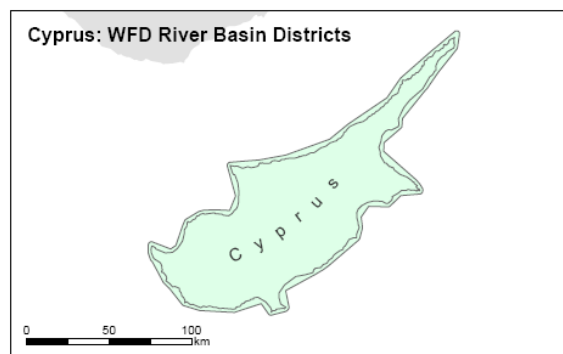
## Member State: CYPRUS

## INFORMATION SUPPLIED

Cyprus reported through WISE in the agreed format. In addition, a summary report which contains additional information has been also uploaded in WISE.

## FACTS AND FIGURES

Cyprus has a population of 0.78 million (Eurostat, 2007) and an area of 11,015 km<sup>2</sup>. Cyprus comprises one River Basin District. There are no transitional waters in Cyprus.



## River basin districts and number of water bodies

River Basin District	Surface (km <sup>2</sup> )	% National territory	Number of river water bodies	Number of lake water bodies	Number of transitional water bodies	Number of coastal water bodies	Number of groundwater bodies
Cyprus	11015	100	217	18	-	25	19
<b>Cyprus</b>	<b>11015</b>	<b>100</b>	<b>217</b>	<b>18</b>	<b>-</b>	<b>25</b>	<b>19</b>

## Number of surveillance, operational and quantitative monitoring stations

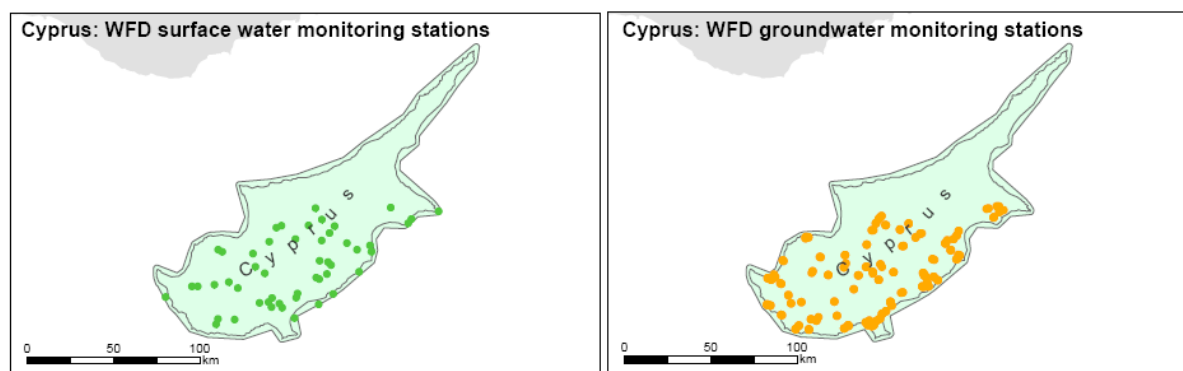
River Basin District	Rivers		Lakes		Transitional waters		Coastal waters		Groundwaters		
	Surv	Op	Surv	Op	Surv	Op	Surv	Op	Surv	Op	Quant
Cyprus	19	12	10	1	-	-	7	1	84	69	84
<b>Total</b>	<b>19</b>	<b>12</b>	<b>10</b>	<b>1</b>	<b>-</b>	<b>-</b>	<b>7</b>	<b>1</b>	<b>84</b>	<b>69</b>	<b>84</b>
<b>Total number of monitoring stations</b>	<b>31</b>		<b>11</b>		<b>-</b>		<b>8</b>		<b>153</b>		

## Number of monitoring stations in protected areas reported under the WFD

River Basin District	Surface water							Ground water
	Bathing water	Habitats / Birds	Drinking water	Fish	Shellfish	Nitrates	Urban waste water	Drinking water
Cyprus	4	13	17	8		6		110
<b>Total</b>	<b>4</b>	<b>13</b>	<b>17</b>	<b>8</b>		<b>6</b>		<b>110</b>

**Note:** the reporting of monitoring of protected areas under the Water Framework Directive was due only if the information was not reported under other directives. A total of 28 surface water monitoring stations for nitrates have been reported by Cyprus under the nitrates Directive in 2008 (reference period 2004-2007). 114 surface water monitoring stations were reported under the bathing water directive (bathing season 2007). Those figures are preliminary as quality checking is on-going at the time this report is written.

### Location of surface water and groundwater monitoring stations



## SURFACE WATER MONITORING PROGRAMMES

### Design of Monitoring Programmes

Cyprus has put *surveillance* and *operational monitoring* programmes in place.

The design of monitoring programmes is strongly influenced by the specific hydrological characteristics of Cyprus. According to the report, nearly 90% of river length presents non-continuous flow. For the purpose of selection of monitoring stations, water bodies with continuous flow for at least 3 months per year were chosen.

The *surveillance monitoring* network is focused on water bodies not at risk and on those needing further assessment. It includes intercalibration and reference sites, stations included in the Information Exchange Decision and in the monitoring under the Nitrates Directive. There are no natural freshwater lakes in Cyprus, only reservoirs. Surveillance monitoring covers 59% of all lake water bodies. In coastal waters, the surveillance network (7 sites in 7 water bodies) is focused on significant water bodies in size and on water bodies needing further assessment (either probably at risk or probably not at risk).

*Operational monitoring* is carried out in 20% of the river water bodies at risk (9 out of 46) and in the only lake and the only coastal water body identified as being at risk. According to the report, the location of monitoring points is related to significant point source and diffuse pollution sources from agriculture.

An *investigative monitoring* programme has been put in place, but is focussed on the applicability of some biological quality elements to the ecological conditions in Cyprus, rather than the purposes of investigative monitoring as laid down in the Directive (see section on development of biological assessment methods below).

The report provides some information on the monitoring of *protected areas*. The reports indicate where Water Framework Directive monitoring sites overlap with monitoring sites for other commitments.

## Development of Biological Assessment Methods

The report discusses the applicability of the biological quality elements in Cyprus.

A method for macroinvertebrates has been intercalibrated but according to the report still needs further development. A research project is on-going to assess the use of macrophytes and phytobenthos in rivers in Cyprus.

The report states that the use of fish in rivers and lakes is not useful as an indicator of ecological status as there is only one native species in Cyprus. This statement is not further substantiated.

In lakes, the assessment of ecological status will be based on phytoplankton. Macrophytes do not develop in reservoirs due to the typical strong seasonal variation in water level. The report states that the usefulness of macroinvertebrates as indicators in lakes is considered low in Europe.

No information has been reported on assessment methods for coastal waters. However, according to the results of the intercalibration exercise<sup>2</sup>, Cyprus has intercalibrated national methods for macroinvertebrates, phytoplankton (chlorophyll-a only) and macroalgae.

### Summary of available biological assessment methods

	Rivers				Lakes				Transitional Waters				Coastal Waters		
	Phytoplankton	Macrophytes and Phytobenthos	Benthic invertebrates	Fish	Phytoplankton	Macrophytes and Phytobenthos	Benthic invertebrates	Fish	Phytoplankton	Macroalgae and Angiosperms	Benthic invertebrates	Fish	Phytoplankton	Macroalgae and Angiosperms	Benthic invertebrates
Cyprus	■	■	■	■	■	-	■	■	-	-	-	-	■	■	■

Method available ■ Under development or incomplete information ■ Not developed or no information ■ Not relevant -

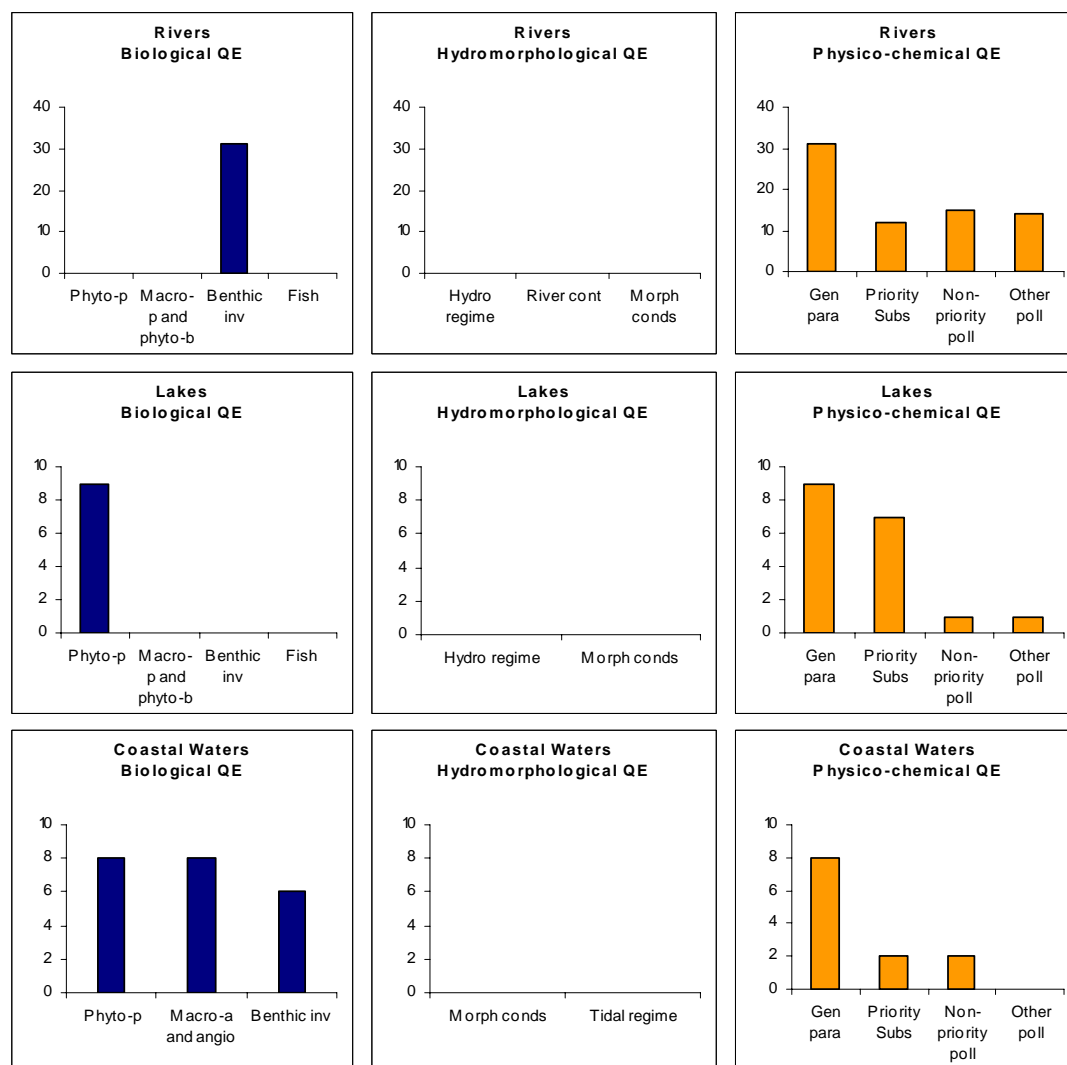
**Note:** In the context of the WFD intercalibration exercise, Cyprus has intercalibrated the national assessment methods for macroinvertebrates in rivers and macroinvertebrates and macroalgae in coastal waters. In addition, Cyprus has intercalibrated parameters indicative of biomass and taxonomic composition and abundance of phytoplankton in lakes (reservoirs only) and a parameter indicative of biomass of phytoplankton in coastal waters (see Commission Decision 2008/915/EC of 30 October 2008 establishing, pursuant to Directive 2000/60/EC of the European Parliament and of the Council, the values of the Member State monitoring system classifications as a result of the intercalibration exercise, available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:332:0020:0044:EN:PDF>).

## Selection of Quality Elements and Frequency of Monitoring

Surveillance monitoring in rivers covers neither aquatic flora nor fish. In lakes, the only biological quality element monitored is phytoplankton and other specific pollutants apart from priority substances are not monitored. In coastal waters all quality elements are monitored.

<sup>2</sup> See Commission Decision 2008/915/EC of 30 October 2008 establishing, pursuant to Directive 2000/60/EC of the European Parliament and of the Council, the values of the Member State monitoring system classifications as a result of the intercalibration exercise (available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:332:0020:0044:EN:PDF>)

### Number of stations where quality elements are monitored (surveillance and operational monitoring) in rivers, lakes, transitional and coastal waters



Biological quality elements are reported to be monitored twice a year, hydromorphological quality elements once a year in rivers and coastal waters and twelve times a year in lakes. Physicochemical quality elements are monitored four times a year in all categories, with *priority substances* twelve times a year in lakes and six times a year in coastal waters.

## GROUNDWATER

### Design of Monitoring Programmes

Cyprus has put in place *quantitative* and *surveillance monitoring* programmes for groundwater. Surveillance monitoring stations may also be used as *operational monitoring* sites.

The quantitative monitoring programme together with other ongoing programmes is reported to be sufficient to ensure proper assessment of impacts due to abstractions and discharges on groundwater level.

Surveillance monitoring programme has taken into account the validation of 2004 pressure and impact analysis and the assessment of long-term trends. Ground water bodies at risk are included in the network.

Drinking water *protected areas* are monitored under the surveillance and quantitative programmes.

The report provides information on monitoring of drinking water protected areas and mentions that the networks have been designed to ensure potential integration of multi-purpose monitoring, e.g. combining requirements for Nitrates Directive monitoring etc. The reference report mentions that the networks have been designed to ensure compliance with protected area objectives.

#### Selection of Quality Elements and Frequency of Monitoring

Core and other pollutants (listed as As, Cd, Pb, Hg, Cl, SO<sub>4</sub>, Trichloroethylene, Tetrachloroethylene) are reported to be selected on basis of potential risk to groundwater under the *surveillance monitoring*.

Groundwater level monitoring will be performed 4 times a year. For surveillance monitoring, general parameters will be monitored once a year and other pollutants twice a year. For operational monitoring general parameters will be monitored twice a year.

#### **FURTHER INFORMATION**

EU-summary report Article 8. Ministry of Agriculture Natural Resources and Environment of the Republic of Cyprus. Nicosia, March 2007

<http://www.moa.gov.cy/moa/wdd/wdd.nsf/All/23B6C4F913B17601C22571760031DEDD?OpenDocument>

Also available at

[http://cdr.eionet.europa.eu/cy/eu/wfdart8/cy001/EU-summary\\_Monitoring\\_Cyprus\\_v22.pdf](http://cdr.eionet.europa.eu/cy/eu/wfdart8/cy001/EU-summary_Monitoring_Cyprus_v22.pdf)

#### **SUMMARY OF TECHNICAL ASSESSMENT: STRENGTHS AND WEAKNESSES**

- + Clear report
- Low density of monitoring stations in coastal waters (8 stations)
- Most of the methods for the assessment of ecological status are not available or under development

Member State: CZECH REPUBLIC

INFORMATION SUPPLIED

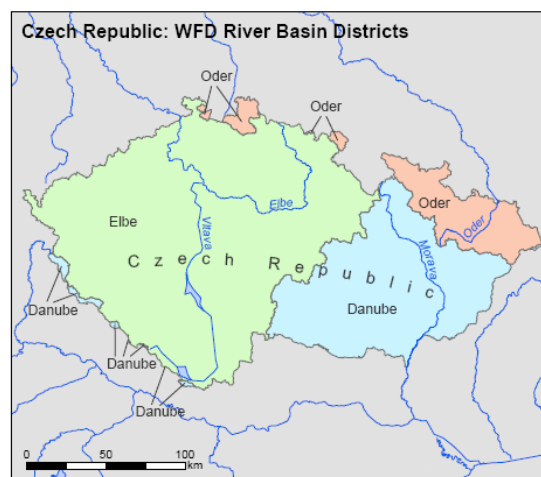
Czech Republic submitted Article 8 reports timely through WISE in the required format for its three international river basin districts: Danube, Elbe and Oder. A weblink for additional information is also provided.

FACTS AND FIGURES

The Czech Republic has a population of 10.3 million (Eurostat, 2007) and an area of 78,867 km<sup>2</sup>.

The Czech Republic is situated in three international river basins: Elbe, Danube and Oder.

The Czech Republic has no transitional or coastal waters.



River basin districts and number of water bodies

River Basin District	Surface (km <sup>2</sup> )	% National territory	Number of river water bodies	Number of lake water bodies	Number of transitional water bodies	Number of coastal water bodies	Number of groundwater bodies
Elbe	49933	63	600	50	-	-	97
Danube	21688	28	301	17	-	-	40
Odra	7246	9	127	8	-	-	24
<b>Czech Republic</b>	<b>78867</b>	<b>100</b>	<b>1028</b>	<b>75</b>	<b>-</b>	<b>-</b>	<b>161</b>

Number of surveillance, operational and quantitative monitoring stations

River Basin District	Rivers		Lakes		Transitional waters		Coastal waters		Groundwaters		
	Surv	Op	Surv	Op	Surv	Op	Surv	Op	Surv	Op	Quant
Elbe	67	528	16	41	-	-	-	-	333	333	451
Danube	32	137	6	22	-	-	-	-	104	104	156
Odra	12	170	5	13	-	-	-	-	25	25	63
<b>Total</b>	<b>111</b>	<b>835</b>	<b>27</b>	<b>76</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>462</b>	<b>462</b>	<b>670</b>
<b>Total number of monitoring stations</b>	<b>885</b>		<b>76</b>		<b>-</b>		<b>-</b>		<b>462</b>		<b>670</b>

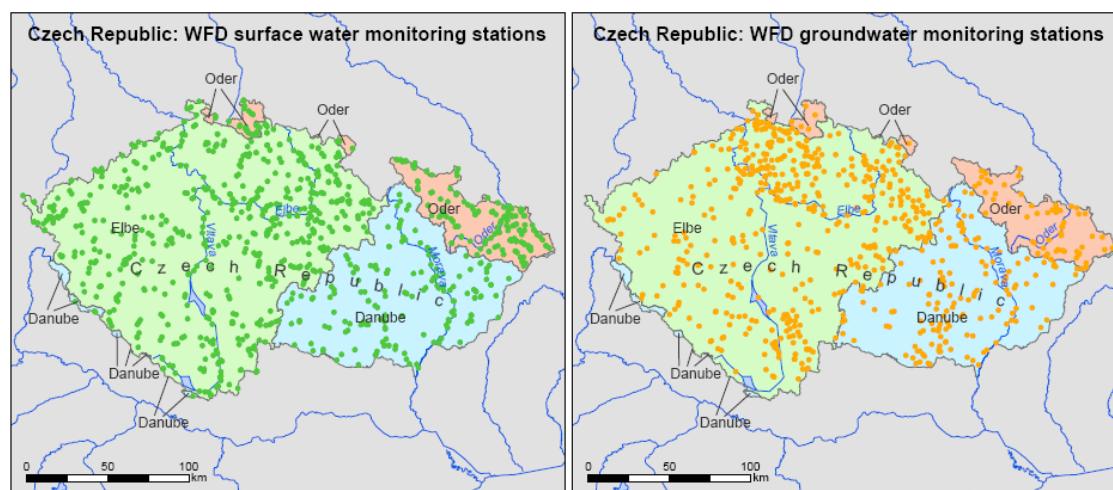
**Note:** Total number of monitoring stations is not necessarily the sum of surveillance and operational as there are stations that serve both purposes. For groundwater all stations for chemical monitoring were reported as both surveillance and operational.

Number of WFD monitoring stations in protected areas reported under WFD

River Basin District	Surface water							Ground water
	Bathing water	Habitats / Birds	Drinking water	Fish	Shellfish	Nitrates	Urban waste water	Drinking water
Elbe								-
Danube								-
Odra								-
<b>Total</b>								-

**Note:** the reporting of monitoring of protected areas under the Water Framework Directive was due only if the information was not reported under other directives. A total of 949 surface water monitoring stations for nitrates have been reported by the Czech Republic under the nitrates Directive in 2008 (reference period 2004-2007). 188 surface water monitoring stations were reported under the bathing water directive (bathing season 2007). Those figures are preliminary as quality checking is on-going at the time this report is written.

Location of surface water and groundwater monitoring stations



**SURFACE WATER MONITORING PROGRAMMES**

Design of Monitoring Programmes

The same design approach, methodologies and standards have been applied in all three river basin districts.

Specific monitoring programmes for operational, surveillance and investigative monitoring have been set up. These monitoring programmes are based on the WFD objectives as well as on those of the national Water Law.

*Surveillance monitoring:* There are two specific sub-programmes for surveillance monitoring – one for rivers and one for lakes. The summary of the monitoring programmes describes the criteria applied in the Danube, Labe and Odra river basin districts, which correspond to the WFD guidance document on monitoring. The validation of the results of the 2004 pressure and impact analysis, the assessment of long-term changes in natural conditions and the long-term changes resulting from widespread anthropogenic activity are included as objectives in the design of the surveillance monitoring network. The surveillance monitoring networks

include no reference sites. The design of the surveillance monitoring network includes those sites meeting at least one of the criteria for selection of monitoring sites required by WFD. Priority in site selection is given to sites of the existing monitoring networks.

*Operational monitoring:* There are two specific sub-programmes for operational monitoring – one for rivers and one for lakes. Operational monitoring is a multipurpose programme addressing the requirements of WFD, those of the Czech national Water Law and also the international commitments of the Czech Republic towards the International Commissions for the Protection of the Danube River, of the Elbe River and of the Odra River. Operational monitoring is based on the existing programmes, which have been upgraded to meet the above mentioned aims. Priority in site selection is given to sites of the existing monitoring networks.

*Investigative monitoring:* The framework monitoring programme in the Czech Republic includes investigative monitoring programmes. Reasons for establishing investigative monitoring are outlined as well as the goals of such monitoring, the principles of selection of monitoring sites and the list of monitoring variables (quality elements, frequencies). Investigative monitoring programmes are specific for a water body or a group of water bodies. They include assessment of impacts of accident pollution. Information on specific incidents is not included in the report. No investigative monitoring activity is in operation at present.

The report states that *protected areas* intended for drinking water abstraction are monitored, but it does not provide information on the stations used for that purpose. There is no information on monitoring of other protected areas.

*International co-ordination* is carried out in the context of both transboundary commissions and co-operation of the expert groups under the international protection convention for the river basin districts. The report gives information on the number of sites belonging to EIONET-water monitoring network and refers to the international river basin conventions (ICPDR, ICPE, ICPO).

#### Development of Biological Assessment Methods

The report contains a thorough description of methods and standards in use for the biological quality elements. There is no specific information on levels of confidence that will be expected from the methods used.

Summary of available biological assessment methods

	Rivers				Lakes				Transitional Waters				Coastal Waters		
	Phytoplankton	Macrophytes and Phyto-benthos	Benthic invertebrates	Fish	Phytoplankton	Macrophytes and Phyto-benthos	Benthic invertebrates	Fish	Phytoplankton	Macroalgae and Angiosperms	Benthic invertebrates	Fish	Phytoplankton	Macroalgae and Angiosperms	Benthic invertebrates
Czech Republic	■	■	■	■	■	■	■	■	-	-	-	-	-	-	-

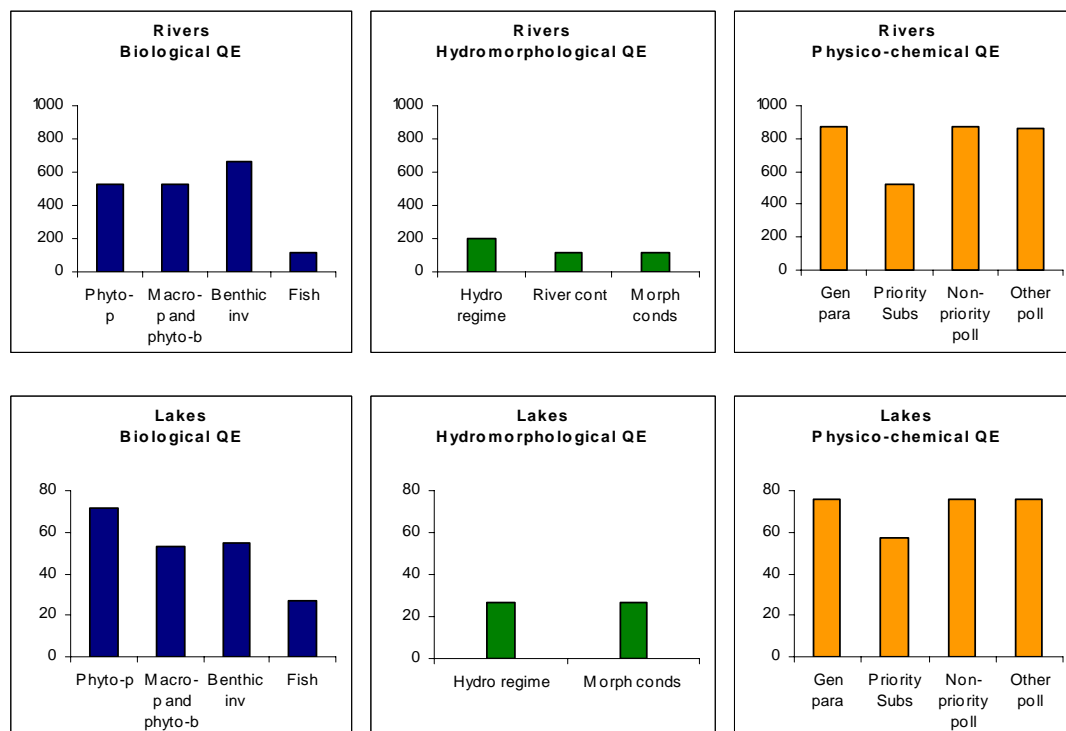
Method available ■ Under development or incomplete information ■ Not developed or no information ■ Not relevant -

**Note:** In the context of the WFD intercalibration exercise, the Czech Republic has not intercalibrated any national assessment methods or parameters (see Commission Decision 2008/915/EC of 30 October 2008 establishing, pursuant to Directive 2000/60/EC of the European Parliament and of the Council, the values of the Member State monitoring system classifications as a result of the intercalibration exercise, available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:332:0020:0044:EN:PDF>).

Selection of Quality Elements and Frequency of Monitoring

The coverage of quality elements in surveillance monitoring is comprehensive for both rivers and lakes, also including monitoring of non-mandatory quality elements (zooplankton in lakes).

Number of stations where quality elements are monitored (surveillance and operational monitoring) in rivers, lakes, transitional and coastal waters



The *frequency* of monitoring of biological quality elements is once every 3 years both in surveillance and in operational monitoring. The number of samples per year varies from 1 to 7 depending on the quality element. Physico-chemical parameters are measured once every three years in surveillance and every year in operational monitoring. Priority substances and other specific pollutants are monitored every year.

#### **GROUNDWATER MONITORING PROGRAMMES**

##### Design of Monitoring Programmes

Groundwater monitoring networks are undergoing an important reconstruction that will be operational only in 2008. The report submitted is based on the existing network. Specific monitoring programmes for operational, surveillance and quantitative monitoring of groundwaters have been reported. However, for chemical monitoring all stations are reported to be both surveillance and operational.

*Monitoring of groundwater quantity* in Czech Republic is based on an existing network.

The design of the network for *monitoring of chemical status* of groundwater takes into account the impacts of point and diffuse sources of pollution. Monitoring network covers the area of infiltration into, flow within and discharge from a groundwater body. Information on pressures, the conceptual model and the fate and behaviour of relevant pollutants were used to determine the most appropriate locations for monitoring points. Higher density of monitoring sites is set in areas with potential contamination of groundwater. Each groundwater body has to be monitored by at least one monitoring site.

The report does not provide information on monitoring stations located in *protected areas*, but explains that this is at the moment part of a separate dedicated monitoring network. The current update of the monitoring networks for groundwater will also integrate the monitoring of protected areas.

Information is provided on monitoring activities under *international conventions* (Elbe, Danube and Odra) and WISE-SoE (former EIONET-Water). There is no information related to monitoring under other EU Directives. Czech Republic has however no transboundary groundwater bodies delineated in the Czech part of the Danube, Odra and Elbe river basin districts.

##### Selection of Quality Elements and Frequency of Monitoring

The chemical monitoring includes all core *parameters* and other parameters indicative of identified pressures.

Groundwater level monitoring will be carried out every year, operational monitoring programmes will be carried out every second year and the surveillance monitoring programmes will be carried out every third year.

#### **FURTHER INFORMATION**

<http://www.ochranavod.cz>

**SUMMARY OF TECHNICAL ASSESSMENT: STRENGTHS AND WEAKNESSES**

- + Clear concept for developing the monitoring programmes following WFD requirements
- + Overall the report is clear and of good quality
- + Methods for assessment of ecological status available
- Frequency of monitoring for surface waters is hardly beyond the minimum required in the WFD
- Additional monitoring of protected areas is not clear

## Member State: DENMARK

## INFORMATION SUPPLIED

Denmark reported through WISE for its four river basin districts in the agreed format. However, a large proportion of the text fields in the WISE report contain only a link to the following report:

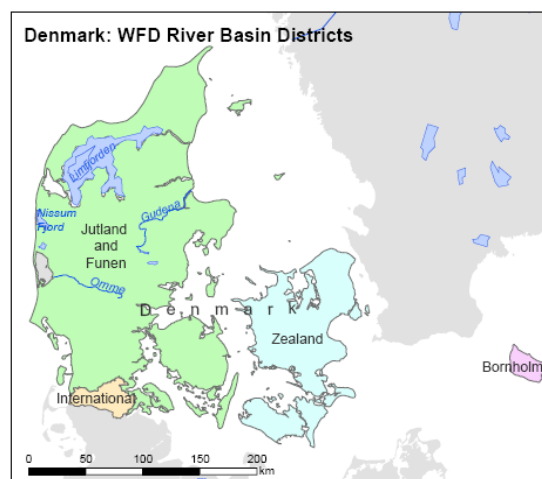
- Report “NOVANA. National Monitoring and Assessment Programme for the Aquatic and Terrestrial Environment” (2005)

## FACTS AND FIGURES

Denmark has a population of 5.5 million (Eurostat, 2007) and an area of 43,321 km<sup>2</sup>.

Denmark shares one river basin district with Germany.

Denmark has not designated transitional waters.



## River basin districts and number of water bodies

River Basin District	Surface (km <sup>2</sup> )	% National territory	Number of river water bodies	Number of lake water bodies	Number of transitional water bodies	Number of coastal water bodies	Number of groundwater bodies
Jutland and Funen	32263	74	24451	1888	-	101	267
Zealand	9362	22	8043	517	-	39	103
International	1101	3	1874	36	-	-	7
Bornholm	595	1	379	18	-	1	6
<b>Denmark</b>	<b>43321</b>	<b>100</b>	<b>34692</b>	<b>2459</b>	<b>-</b>	<b>141</b>	<b>383</b>

**Note:** Denmark is undertaking a re-delineation of river water bodies intended to reduce the total number to ca. 5000. At the time of writing this report the process has not concluded and therefore the numbers shown in the table for rivers are the ones reported in 2005 in the context of the Article 5 report.

## Number of surveillance, operational and quantitative monitoring stations

River Basin District	Rivers		Lakes		Transitional waters		Coastal waters		Groundwaters		
	Surv	Op	Surv	Op	Surv	Op	Surv	Op	Surv	Op	Quant
Jutland and Funen	547	561	163	164	-	-	22	34	544	544	87
Zealand	149	154	96	97	-	-	11	16	275	275	31
International	20	21	4	4	-	-	-	-	23	23	3
Bornholm	12	12	0	0	-	-	1	1	16	16	2
<b>Total</b>	<b>728</b>	<b>748</b>	<b>263</b>	<b>265</b>	<b>-</b>	<b>-</b>	<b>34</b>	<b>51</b>	<b>858</b>	<b>858</b>	<b>123</b>
<b>Total number of monitoring stations</b>	<b>748</b>		<b>265</b>		<b>-</b>		<b>51</b>		<b>858</b>		<b>123</b>

**Note:** Total number of monitoring stations is not necessarily the sum of surveillance and operational as there are stations that serve both purposes. In the case of Denmark almost all stations were identified as both surveillance and operational.

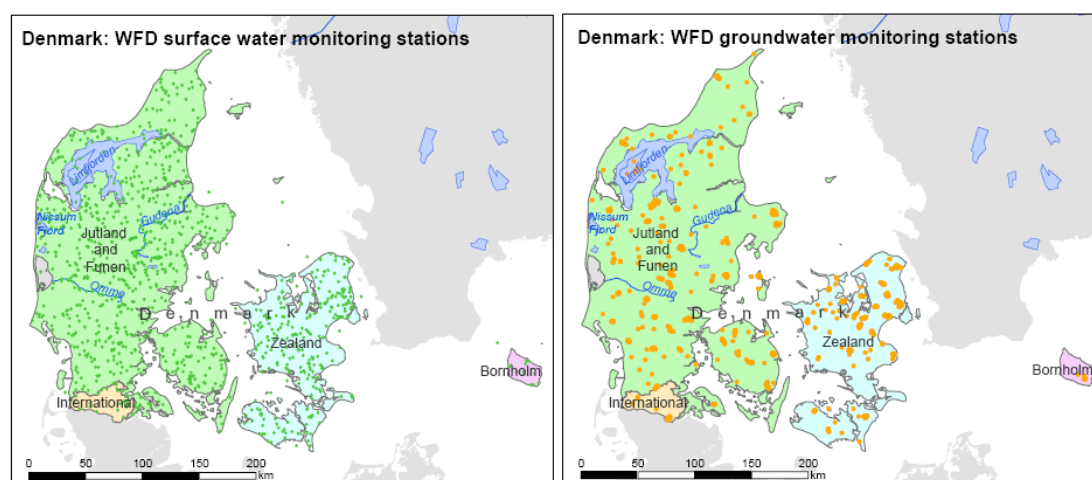
## Number of monitoring stations in protected areas reported under the WFD

River Basin District	Surface water							Ground water
	Bathing water	Habitats / Birds	Drinking water	Fish	Shellfish	Nitrates	Urban waste water	Drinking water
Jutland and Funen						-	-	35
Zealand						-	-	32
International						-	-	1
Bornholm						-	-	2
<b>Total</b>						-	-	<b>70</b>

## Note:

- The reporting of monitoring of protected areas under the Water Framework Directive was due only if the information was not reported under other directives. At the time of writing this report, Denmark has not submitted yet the reports due in 2008 under the bathing water and nitrates Directives.
- Denmark has established and applies action programmes in the whole of its territory and therefore, in accordance to article 3.5 of the Nitrates Directive 1991/676/EEC, it is exempted from designation of specific vulnerable zones.
- Denmark applies more stringent waste water treatment in the whole of its territory and therefore, in accordance to article 5.8 of the Urban Waste Water Directive 1991/271/EEC, it is exempted from designation of specific sensitive areas.

## Location of surface water and groundwater monitoring stations



## SURFACE WATER MONITORING PROGRAMMES

Design of Monitoring Programmes

Monitoring programmes for all 4 river basin districts are designed in a uniform and transparent manner, although they have a highly complex structure with very many different sub-programmes dealing with different water categories, purposes and quality elements, as well as different monitoring frequencies.

The Danish monitoring programmes for lakes, rivers and coastal waters are designed to meet the requirements of both *surveillance and operational monitoring*. DEVANO 2008 is a programme under NOVANA that explicitly relates to operational monitoring in order to the establishment of status for the water bodies identified as being at risk according to the article 5 analyses. The description of the NOVANA national monitoring programme (pdf-files given as link in the Article 8 report), states that NOVANA incorporates Denmark's obligations

under the Water Framework Directive regarding surveillance monitoring of groundwater and surface waters.

The programme encompasses a mix of extensive and intensive sub-programmes, the former including a less frequent monitoring in a large amount of stations and the latter a more frequent monitoring in a reduced number of stations. The intensive monitoring is designed to describe trends. It encompasses reference stations, but it is not clear from the reports how many sites are reference sites in each of the sub-programmes.

The report for Zealand river basin district describes trend stations (e.g. intensively monitored sites) are included with the aim to provide detection of trends of 1-2% per year after 15 years for rivers and after 30 years for lakes and coastal waters.

There is a strategy for *investigative monitoring* in place.

There is no surface water monitoring of *drinking water protected water*, since only groundwater is used for drinking water supply.

NOVANA is requirement-driven and includes meeting Denmark’s international obligations. No information is given, however, on which stations are used for other directives/conventions than the WFD.

Development of Biological Assessment Methods

Many technical documents are available describing Danish monitoring (NOVANA). Detailed information is provided on sampling, analyses, and frequency, for all quality elements, except for phytoplankton and phytobenthos in rivers (although a method for macrophytes is available).

No information is available on the levels of confidence.

**Summary of methods available**

	Rivers				Lakes				Transitional Waters				Coastal Waters		
	Phytoplankton	Macrophytes and Phytobenthos	Benthic invertebrates	Fish	Phytoplankton	Macrophytes and Phytobenthos	Benthic invertebrates	Fish	Phytoplankton	Macroalgae and Angiosperms	Benthic invertebrates	Fish	Phytoplankton	Macroalgae and Angiosperms	Benthic invertebrates
Denmark	■	■	■	■	■	■	■	■	-	-	-	-	■	■	■

Method available ■ Under development or incomplete information ■ Not developed or no information ■ Not relevant -

**Note:** In the context of the WFD intercalibration exercise, Denmark has intercalibrated the national assessment methods for macroinvertebrates in rivers and coastal waters. In addition, Denmark has intercalibrated a parameter indicative of biomass of phytoplankton in lakes and in coastal waters (chlorophyll-a) and a parameter indicative of abundance of angiosperms in coastal waters (depth limit, in the Baltic Sea) (see Commission Decision 2008/915/EC of 30 October 2008 establishing, pursuant to Directive 2000/60/EC of the European Parliament and of the Council, the values of the Member State monitoring system classifications as a result of the intercalibration exercise, available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:332:0020:0044:EN:PDF>).

### Selection of Quality Elements and Frequency of Monitoring

Monitoring covers all quality elements in all water categories except phytoplankton in rivers. However, the fact that all NOVANA programmes are marked as both surveillance and operational monitoring, together with the lack of reporting of quality elements at station level, has complicated the analysis of the information and has made it difficult to know which quality elements are monitored in which type of monitoring.

#### **Number of stations where quality elements are monitored (surveillance and operational monitoring) in rivers, lakes, transitional and coastal waters**

Note: It is not possible to display this information due to the inconsistency of the information reported<sup>3</sup>.

Macroinvertebrates and fish are used in operational monitoring of rivers (DEVANO programmes). Also aquatic flora is monitored in the “intensive” NOVANA sub-programmes. In lakes and coastal waters, a range of quality elements are used for operational monitoring and are included in the intensive sub-programmes.

Monitoring frequency of quality elements varies but is generally every 3 or 6 years in the NOVANA extensive monitoring and every 1 or 2 years in the DEVANO or the NOVANA intensive programmes.

### **GROUNDWATER MONITORING PROGRAMMES**

#### Design of Monitoring Programmes

In the reported separate documents, it is acknowledged that the monitoring is covering obligations under the WFD regarding surveillance monitoring and to meet in part the requirements for operational monitoring of ground waters. The actual article 8 reports only provide very limited information and refer to the separate linked documents for additional information. The main report was published in 2005. In the report it is recognised that further modifications are needed to fully comply with the requirements of the Water Framework and the Habitat Directives, and that this was programmed for 1 January 2007. However in the art 8 reports submitted there is no clear indication of what and if these adjustments have been made and implemented.

There are 5 sub-programmes for surveillance monitoring, subdivided into intensive and extensive monitoring for both hazardous substances and main chemicals as well as redox.

The art 8 report mentions that there will be a one off operational sub-programme carried out for 1 year for a prioritised selection of ground water bodies at risk according to the article 5 analysis.

The monitoring programme is reported to have been designed to fulfil Denmark obligations under international agreements including the directives and international conventions including on the Nitrates Directives as well as the OECD/Eurostat Joint Questionnaire. The reports do not provide specific information on additional monitoring requirements for protected areas and transboundary ground water bodies. It is not clear how the information in the report refers to monitoring of drinking water abstraction areas.

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<sup>3</sup> The data submitted for the International river basin district DK4 appears to be wrong (monitoring programmes information is taken from Zealand river basin district). In addition, the information in the stations file does not match the one in the monitoring programmes file.

### Selection of Quality Elements and Frequency of Monitoring

Relevant core parameters are reported to be monitored in all river basin districts and for operational monitoring additional risk-based parameters are also reported to be monitored. One sub-programme for quantitative monitoring is reported, with monitoring to be carried out once every year in the first cycle.

Chemical surveillance and operational monitoring is reported to be carried out at least once every year for the first cycle. There are however some differences between sub-programmes and quality elements. In general for intensive surveillance programmes, pesticides are monitored once every year. Other organic pollutants are monitored only every six years and metals are monitored every three years. For extensive surveillance programme, main chemicals will be monitored every 6 years and for hazardous substances every 3 years. These can be increased depending on the concentrations measured in the period 1989 - 2005. In the extensive main chemical monitoring, if the nitrate concentration is higher than 3 mg/l, monitoring is increased from once every six years to every three years.

#### **FURTHER INFORMATION**

NOVANA, National Monitoring and Assessment Programme for the Aquatic and Terrestrial Environment. Programme Description – Part 1. NERI Technical Report, No. 532. Available at [http://www.dmu.dk/NR/ronlyres/0DDB35D3-31DC-42F4-BA13-2956723158CA/0/FR532\\_www.pdf](http://www.dmu.dk/NR/ronlyres/0DDB35D3-31DC-42F4-BA13-2956723158CA/0/FR532_www.pdf)

NOVANA, National Monitoring and Assessment Programme for the Aquatic and Terrestrial Environments Programme Description – Part 2, NERI Technical Report, No. 537. Available at : [http://www.dmu.dk/NR/ronlyres/5EC5E735-724E-4769-A560-D53613C89536/0/FR537\\_www\\_S\\_H.pdf](http://www.dmu.dk/NR/ronlyres/5EC5E735-724E-4769-A560-D53613C89536/0/FR537_www_S_H.pdf)

Sampling methodology and analysis methodology ; :

NOVANA, Technical instructions on marine monitoring, Part 1-7. Peter Henriksen, Afdeling for Marin Økologi. Hanne Kaas, DHI – Institut for vand og miljø, Miljøministeriet. Danmarks Miljøundersøgelser. Link to overview : [http://www2.dmu.dk/1\\_om\\_dmu/2\\_tvaer-funk/3\\_fdc\\_mar/programgrundlag/TekAnv2004\\_2009/TA04\\_oversigt.pdf](http://www2.dmu.dk/1_om_dmu/2_tvaer-funk/3_fdc_mar/programgrundlag/TekAnv2004_2009/TA04_oversigt.pdf)

NOVANA, Monitoring in lakes, technical instructions from DMU, *no. 22, 2005*.

*Editors: Torben L. Lauridsen, Martin Søndergaard, Jens Peder Jensen, Erik Jeppesen.*

**Danmarks Miljøundersøgelser, Miljøministeriet. Link :**

[http://www2.dmu.dk/1\\_viden/2\\_Publikationer/3\\_tekanvisning/rapporter/TA22.pdf](http://www2.dmu.dk/1_viden/2_Publikationer/3_tekanvisning/rapporter/TA22.pdf)

In addition to the documents listed below, links are provided for a large number of additional documents relating to surface and ground waters:

<http://www.dmu.dk/Overvaagning/NOVANA/Programbeskrivelse+del+3/baggrund>

<http://www.dmu.dk/Overvaagning/NOVANA/Programbeskrivelse+del+3/Forpligtelser>

#### **SUMMARY OF TECHNICAL ASSESSMENT: STRENGTHS AND WEAKNESSES**

- + Most methods for assessment of ecological status available
- Additional monitoring of protected areas is not clear
- WISE reporting is incomplete, referring largely to separate documents, and provides inconsistent information

## Member State: ESTONIA

## INFORMATION SUPPLIED

Estonia has reported through WISE in the agreed format for its three river basin districts. The following supportive documents in Estonian were provided through WISE for each of the three river basin districts:

- Lääne-Eesti vesikond (ÜLEVAATESEIRE, JÕED)
- Ida-Eesti vesikond (ÜLEVAATESEIRE, JÕED)
- Koiva vesikond (ÜLEVAATESEIRE, JÕED)

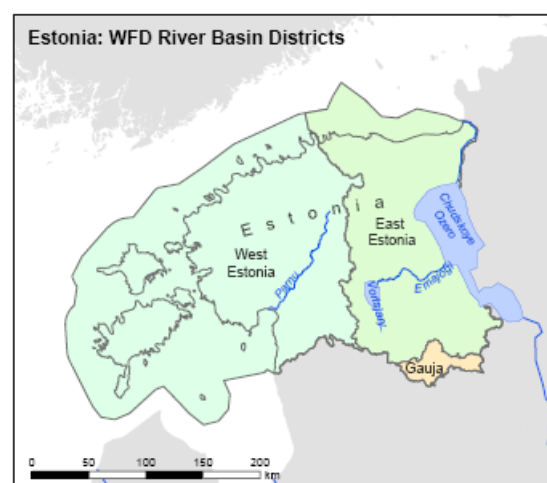
The documents make reference to additional information for the sampling and analytical methodology as well as some information on the design of monitoring networks.

## FACTS AND FIGURES

Estonia has a population of 1.3 million (Eurostat, 2007) and an area of 43,860 km<sup>2</sup>.

Estonia includes two international river basins: East Estonia and Gauja.

Estonia has no transitional waters.



## River basin districts and number of water bodies

River Basin District	Surface (km <sup>2</sup> )	% National territory	Number of river water bodies	Number of lake water bodies	Number of transitional water bodies	Number of coastal water bodies	Number of groundwater bodies
West Estonia	23478	64	669	35	-	14	10
East Estonia	19047	34	372	37	-	2	14
Gauja	1335	2	58	7	-	-	2
<b>Estonia</b>	<b>43860</b>	<b>100</b>	<b>1099</b>	<b>79</b>	<b>-</b>	<b>16</b>	<b>26</b>

## Number of surveillance, operational and quantitative monitoring stations

River Basin District	Rivers		Lakes		Transitional waters		Coastal waters		Groundwaters		
	Surv	Op	Surv	Op	Surv	Op	Surv	Op	Surv	Op	Quant
West Estonia	108	4	35	0	-	-	47	0	189	0	118
East Estonia	108	13	54	24	-	-	8	0	191	44	137
Gauja	10	0	7	0	-	-	-	-	3	0	2
<b>Total</b>	<b>226</b>	<b>17</b>	<b>96</b>	<b>24</b>	<b>-</b>	<b>-</b>	<b>55</b>	<b>0</b>	<b>383</b>	<b>44</b>	<b>257</b>
<b>Total number of monitoring stations</b>	<b>226</b>		<b>96</b>		<b>-</b>		<b>55</b>		<b>427</b>		<b>257</b>

**Note:** Total number of monitoring stations is not necessarily the sum of surveillance and operational as there are stations that serve both purposes

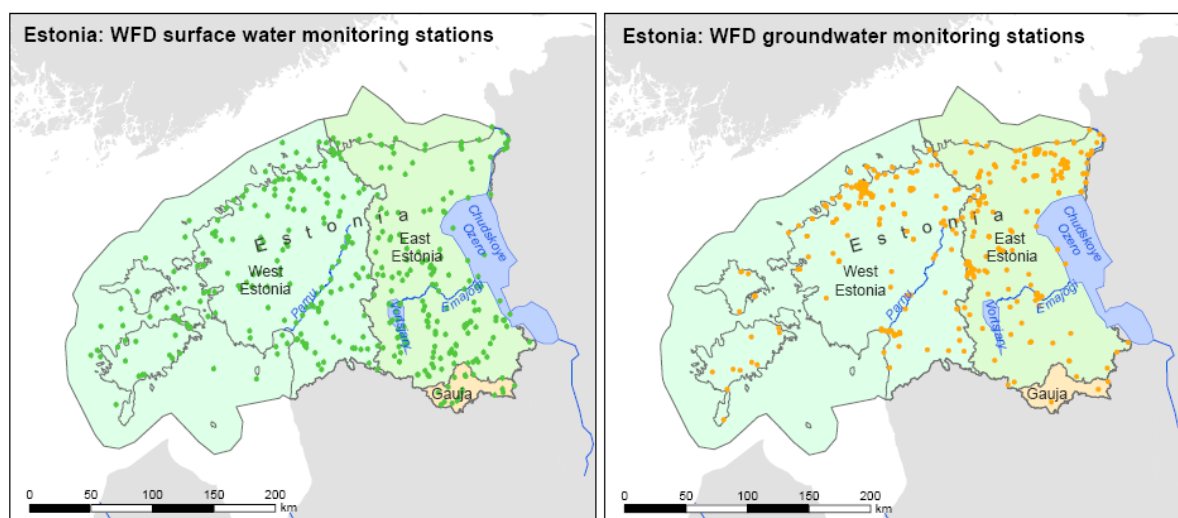
### Number of monitoring stations in protected areas reported under WFD

River Basin District	Surface water							Ground water
	Bathing water	Habitats / Birds	Drinking water	Fish	Shellfish	Nitrates	Urban waste water	Drinking water
West Estonia			3				-	
East Estonia			4				-	
Gauja							-	
<b>Total</b>			<b>7</b>				<b>-</b>	

#### Note:

- The reporting of monitoring of protected areas under the Water Framework Directive was due only if the information was not reported under other directives. A total of 10 surface water monitoring stations for nitrates have been reported by Estonia under the nitrates Directive in 2008 (reference period 2004-2007). 56 surface water monitoring stations were reported under the bathing water directive (bathing season 2007). Those figures are preliminary as quality checking is on-going at the time this report is written.
- Estonia applies more stringent waste water treatment in the whole of its territory and therefore, in accordance to article 5.8 of the Urban Waste Water Directive 1991/271/EEC, it is exempted from designation of specific sensitive areas.

### Location of surface water and groundwater monitoring stations



## SURFACE WATER MONITORING PROGRAMMES

### Design of Monitoring Programmes

Monitoring programmes are primarily structured according to water category (rivers, small lakes and coastal waters) with two separate programmes for rivers based on different quality components (hydrochemistry and biology). Almost all sub-programmes cover *both operational and surveillance monitoring* except for coastal water, for which there is no operational monitoring. The number of surveillance monitoring stations is substantially higher than the operational stations. The report is very brief and there is no information on the overall design considerations, hence it is not possible to know what the reasons are for that.

Monitoring in rivers relies largely on a yearly monitoring of physico-chemical parameters. The biological monitoring is carried out every 5 years only. Operational monitoring in rivers is carried out in a limited number of stations and it does not include biological quality

elements. In lakes there is annual monitoring of biological quality elements together with physico-chemical parameters.

No information is reported on *investigative monitoring*.

The assessment of long term changes in natural conditions and changes due to widespread anthropogenic pressures have been incorporated into the design.

No information is provided *on level of confidence and precision* expected to be achieved by the monitoring programmes.

A few monitoring sites located in *drinking water protected* areas are indicated. No further information is provided on monitoring of *protected areas*. There is neither information on monitoring sites associated with other *international commitments*, except for general references with the HELCOM Baltic Sea monitoring programme in the coastal waters section of the written report. No information on other international co-ordination was provided in the reports.

### Development of Biological Assessment Methods

Information on sampling, analysis and frequency methodology is described in the additional textual reports. For most of the methods the information is very brief and it is not clear whether a national assessment method has been developed or it is just a sampling method which is available. In general, there is more detail for lakes (except for fish) and there are references to publications. For coastal waters there is a reference to the HELCOM Combine manual.

There is incomplete information *on levels of confidence and precision* with only generic statements.

### Summary of available biological assessment methods

	Rivers				Lakes				Transitional Waters				Coastal Waters		
	Phytoplankton	Macrophytes and Phytobenthos	Benthic invertebrates	Fish	Phytoplankton	Macrophytes and Phytobenthos	Benthic invertebrates	Fish	Phytoplankton	Macroalgae and Angiosperms	Benthic invertebrates	Fish	Phytoplankton	Macroalgae and Angiosperms	Benthic invertebrates
Estonia	■	■	■	■	■	■	■	■	-	-	-	-	■	■	■

Method available ■    Under development or incomplete information ■    Not developed or no information ■    Not relevant -

**Note:** In the context of the WFD intercalibration exercise, Estonia has intercalibrated the national assessment methods for phytoplankton in rivers and macrophytes in lakes. In addition, Estonia has intercalibrated a parameter indicative of biomass of phytoplankton in lakes and in coastal waters (chlorophyll-a) (see Commission Decision 2008/915/EC of 30 October 2008 establishing, pursuant to Directive 2000/60/EC of the European Parliament and of the Council, the values of the Member State monitoring system classifications as a result of the intercalibration exercise, available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:332:0020:0044:EN:PDF>).

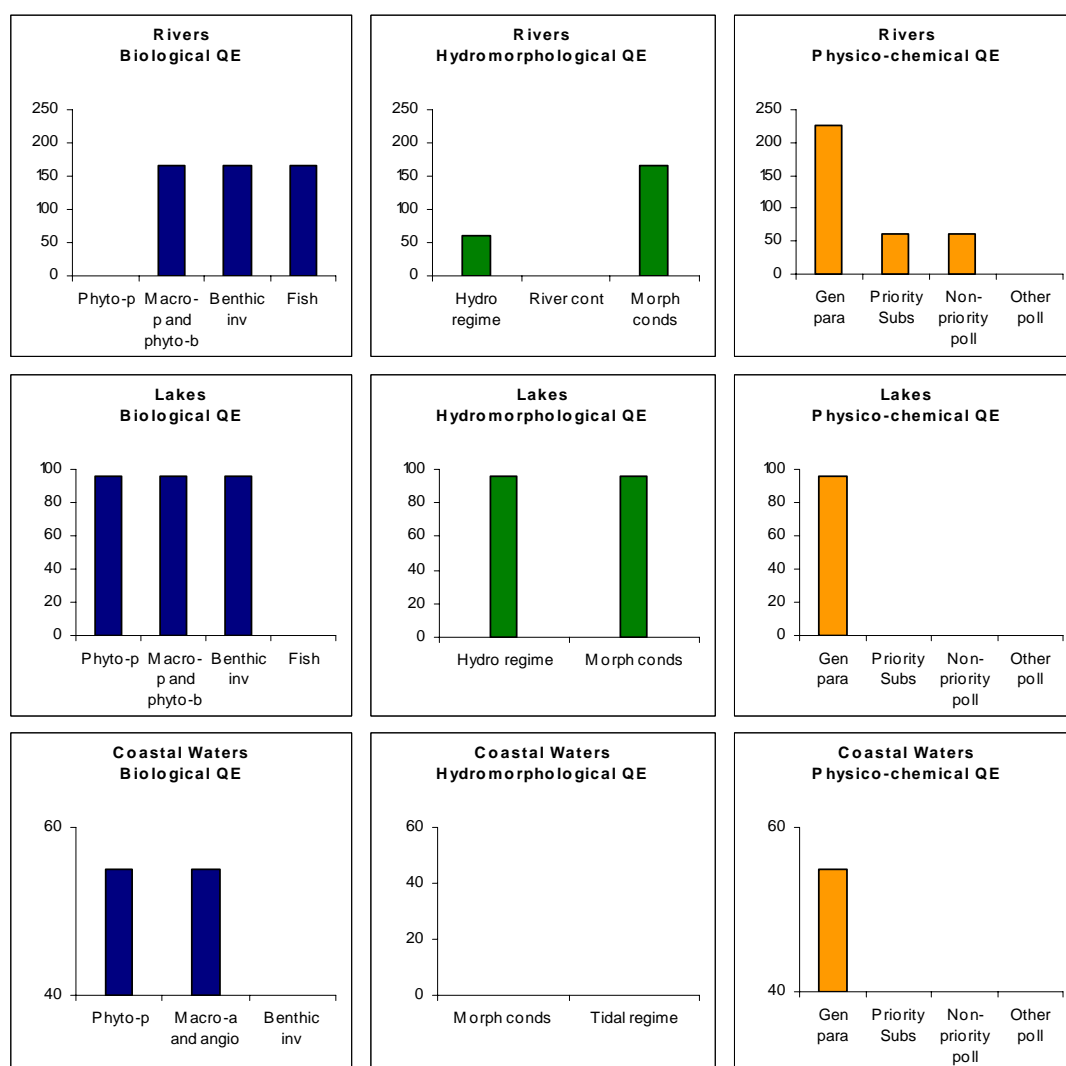
## Selection of Quality Elements and Frequency of Monitoring

Except those for coastal waters, all sub-programmes are marked as surveillance and operational and therefore it is not possible to distinguish which quality elements are monitored under which type of monitoring.

Surveillance monitoring in rivers does not include phytoplankton. In lakes, it does not include fish, priority substances and other specific pollutants. Macroinvertebrates, priority substances and other specific pollutants are not monitored in coastal waters.

As regards monitoring frequency, in lakes phytoplankton is monitored every year and macroinvertebrates every 5 years; the monitoring frequency of other aquatic flora is not clear. In rivers biological quality elements are monitored every 5 years only.

### Number of stations where quality elements are monitored (surveillance and operational monitoring) in rivers, lakes, transitional and coastal waters



## GROUNDWATER MONITORING PROGRAMMES

### Design of Monitoring Programmes

The same methodology was used in each of the three river basin districts across Estonia. There are specific monitoring programmes for two groundwater networks: a) 'hydrochemistry' covering *both surveillance and operational* monitoring and b) groundwater level monitoring. The factors taken into account in the design of the monitoring programmes are the hydro-geological conditions, pressures and impacts (such as abstraction), availability of long-term data, nitrates sensitive areas, and trans-boundary groundwater bodies. It is unclear, how the results of the 2005 analysis have been taken into account.

There is only one ground water body identified being at risk in Estonia, in the East Estonia river basin district, which is covered by *operational monitoring* programme. The operational network will be updated following the results of the surveillance monitoring.

Information on *protected areas* is limited to the number of *drinking water abstraction* areas. Nitrate sensitive areas were taken into account when designing monitoring network.

*Transboundary* groundwater bodies are included in the national monitoring network but no international monitoring requirements are mentioned.

### Selection of Quality Elements and Frequency of Monitoring

Chemical monitoring, covering *both surveillance and operational monitoring*, mentions only general parameters (other specific parameters and other pollutants are not included).

*Frequency* of groundwater level is monitored monthly, every year of the 6 year cycle. General chemical parameters are measured once every year.

## FURTHER INFORMATION

No further information was provided.

## SUMMARY OF TECHNICAL ASSESSMENT: STRENGTHS AND WEAKNESSES

- + All lake water bodies are included in surveillance monitoring with annual monitoring for a number of quality elements
- The report is very brief and there is no explanation of the design considerations of the monitoring programmes. The number of surveillance monitoring stations in rivers is much higher than the operational without clear explanation.
- It is not clear if operational monitoring in rivers covers biological quality elements
- No information on monitoring of protected areas

## Member State: FINLAND

## INFORMATION SUPPLIED

Information was timely provided in WISE in the agreed format. The report covers Finland's eight river basin districts (7 mainland including 2 international and 1 island).

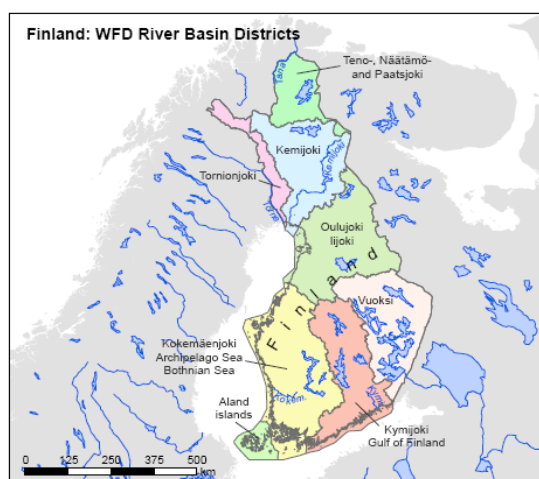
There were additional weblink and reports provided supplementing the general information included in the electronic report:

- *Vesienhoitoalueen seuranta. Seurannan periaatteet ja esimerkkejä seurantaohjelman laatimisen.* (River basin's monitoring. Principles of monitoring and samples to design the monitoring programme.) Ympäristöministeriön Raportteja. 20/2006. (Ministry of Environment).
- *Ympäristön seuranta Suomessa 2006-2008. Jorma Niemi (toim)* (Environmental monitoring in Finland 2006-2008. Jorma Niemi (editor)).
- *Suomen Ympäristö 24/2006. Suomen Ympäristökeskus.* (Finnish Environment Center publication).

## FACTS AND FIGURES

Finland has a population of 5.3 million (Eurostat, 2007) and an area of 370,807 km<sup>2</sup> (including coastal waterbodies).

Finland has identified no transitional waters.



## River basin districts and number of water bodies

River Basin District	Surface (km <sup>2</sup> ) <sup>1)</sup>	% National territory	Number of river water bodies	Number of lake water bodies	Number of transitional water bodies	Number of coastal water bodies	Number of groundwater bodies
Kokemäenjoki-Archipelago Sea-Bothnian Sea	83357	22	243	273	-	124	1006
Oulujoki-Iijoki	68084	18	96	122	-	16	551
Vuoksi	58158	16	145	472	-	-	692
Kemijoki	54850	15	58	42	-	5	314
Kymijoki-Gulf of Finland	57074	15	237	612	-	46	908
Teno-, Näättämo- and Paatsjoki (Finnish part)	25566	7	18	29	-	-	24
Tornionjoki (Finnish part)	14587	4	32	22	-	3	108
Aland islands	9131	2	-	2	-	61	5
<b>Finland</b>	<b>370807</b>	<b>100</b>	<b>829</b>	<b>112</b>	<b>-</b>	<b>255</b>	<b>3608</b>

**Notes:**

1. Surface area includes the coastal water bodies.

2. According to the Finnish authorities, the number of water bodies is preliminary and will be reviewed by March 2010.

## Numbers of surveillance, operational and quantitative monitoring stations

River Basin District	Rivers		Lakes		Transitional waters		Coastal waters		Groundwaters		
	Surv	Op	Surv	Op	Surv	Op	Surv	Op	Surv	Op	Quant
Kokemäenjoki-Archipelago Sea-Bothnian Sea	17	18	11	6	-	-	27	21	23	37	29
Oulujoki-Iijoki	21	10	11	2	-	-	2	3	50	5	48
Vuoksi	12	1	38	3	-	-	-	-	23	10	24
Kemijoki	5	2	2	2	-	-	1	2	20	0	16
Kymijoki-Gulf of Finland	10	9	28	2	-	-	15	15	43	32	50
Teno-, Näättäjä- and Paatsjoki (Finnish part)	6	0	1	0	-	-	-	-	8	0	3
Tornionjoki (Finnish part)	2	0	1	0	-	-	0	1	13	0	10
Åland islands	-	-	0	0	-	-	11	40	0	0	1
<b>Total</b>	<b>73</b>	<b>40</b>	<b>92</b>	<b>15</b>	<b>-</b>	<b>-</b>	<b>62</b>	<b>88</b>	<b>180</b>	<b>84</b>	<b>181</b>
<b>Total number of monitoring stations</b>	<b>89</b>		<b>104</b>		<b>-</b>		<b>118</b>		<b>255</b>		<b>181</b>

**Notes:**

- Total number of monitoring stations is not necessarily the sum of surveillance and operational as there are stations that serve both purposes
- The numbers of coastal waters monitoring stations in Åland river basin district presented in this table differ substantially from the ones reported under article 8 by Finland, which are the ones used in the indicators and tables in the rest of this report (6 surveillance stations and 6 operational). The numbers in the table above have been provided as a response to a consultation in January 2009.

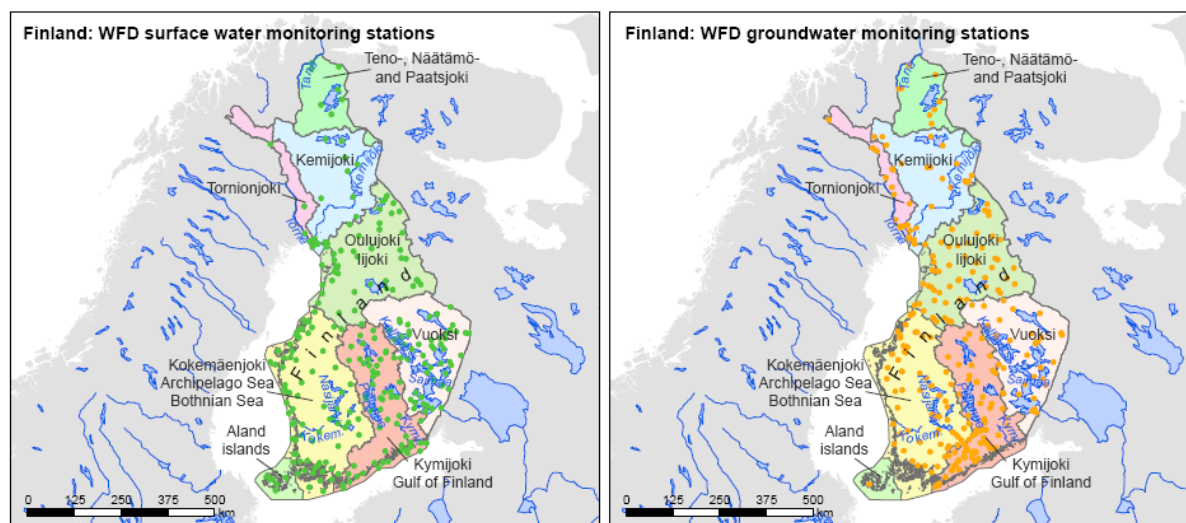
## Number of monitoring stations in protected areas reported under the WFD

River Basin District	Surface water							Ground water
	Bathing Water	Habitats / Birds	Drinking Water	Fish	Shellfish	Nitrates	Urban waste water	Drinking water
Kokemäenjoki-Archipelago Sea-Bothnian Sea	11	23	18	10	-	-	-	39
Oulujoki-Iijoki	10	15	2	4	-	-	-	35
Vuoksi	10	24	4	9	-	-	-	15
Kemijoki		5		2	-	-	-	17
Kymijoki-Gulf of Finland	3	34	2	7	-	-	-	42
Teno-, Näättäjä- and Paatsjoki (Finnish part)		3			-	-	-	6
Tornionjoki (Finnish part)		2			-	-	-	10
Åland islands	9	6	7		-	-	-	4
<b>Total</b>	<b>43</b>	<b>112</b>	<b>33</b>	<b>32</b>				<b>168</b>

**Notes:**

- the reporting of monitoring of protected areas under the Water Framework Directive was due only if the information was not reported under other directives. A total of 202 surface water monitoring stations for nitrates have been reported by Finland under the Nitrates Directive in 2008 (reference period 2004-2007). 347 surface water monitoring stations were reported under the Bathing Water Directive (bathing season 2007). Those figures are preliminary as quality checking is on-going at the time this report is written.
- Finland has established and applies action programmes in the whole of its territory and therefore, in accordance to article 3.5 of the Nitrates Directive 1991/676/EEC, it is exempted from designation of specific vulnerable zones.
- Finland applies more stringent waste water treatment in the whole of its territory and therefore, in accordance to article 5.8 of the Urban Waste Water Directive 1991/271/EEC, it is exempted from designation of specific sensitive areas.

## Location of surface water and groundwater monitoring stations



## SURFACE WATER MONITORING PROGRAMMES

### Design of Monitoring Programmes

The surface water monitoring programme for each river basin district has a subprogramme for each of the relevant water categories present in the river basin district. Each subprogramme is used for both *surveillance and operational monitoring* purposes except for one river basin district where no operational monitoring is reported. The report and supporting documents state that the specific WFD design criteria for surveillance and operational monitoring have been incorporated into the monitoring programmes. There is no monitoring programmes for lakes in Aland river basin districts.

The density of monitoring stations for rivers and lakes is the lowest in the EU (see Table 7 in the Commission Staff Working Document). The Finnish river basin districts show the lowest density per 1000 km<sup>2</sup> of all river basin districts in the EU. The highest densities, present in some of the most populated river basin districts in the South of the country, do not reach 1 station per 1000 km<sup>2</sup>.

Five out of the eight river basin district reports give an example of where *investigative monitoring* has taken place following, for example, a pollution incident or bird/fish kill. For the other three river basin districts the report states that no investigative monitoring has been required.

The reports provide some information on monitoring of *protected areas* but the information is generally not comprehensive.

It appears that there is some *international coordination* of monitoring activities, although the details are unclear. Reference is made to participation in the WISE-SoE (formerly EIONET-water) network, indicating some sites included. Monitoring stations included in a transboundary convention are also identified.

## Development of Biological Assessment Methods

Information on the sampling, analysis and standards methodology is provided. There are methods developed for most biological quality elements and a national fish index for use in rivers and lakes is said to be under development. It is stated for rivers that metrics for macrophytes will be developed.

There are no numeric indications of *levels of confidence* anticipated, but general statements are given about training and guidance, assuring data reliability.

### Summary of available biological assessment methods

	Rivers				Lakes				Transitional Waters				Coastal Waters		
	Phytoplankton	Macrophytes and Phytobenthos	Benthic invertebrates	Fish	Phytoplankton	Macrophytes and Phytobenthos	Benthic invertebrates	Fish	Phytoplankton	Macroalgae and Angiosperms	Benthic invertebrates	Fish	Phytoplankton	Macroalgae and Angiosperms	Benthic invertebrates
Finland	■	■	■	■	■	■	■	■	-	-	-	-	■	■	■

Method available ■ Under development or incomplete information ■ Not developed or no information ■ Not relevant -

**Note:** In the context of the WFD intercalibration exercise, Finland has intercalibrated the national assessment methods for macroinvertebrates and phytobenthos in rivers and macroinvertebrates in coastal waters. In addition, Finland has intercalibrated a parameter indicative of biomass of phytoplankton in lakes and in coastal waters (chlorophyll-a) (see Commission Decision 2008/915/EC of 30 October 2008 establishing, pursuant to Directive 2000/60/EC of the European Parliament and of the Council, the values of the Member State monitoring system classifications as a result of the intercalibration exercise, available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:332:0020:0044:EN:PDF>).

## Selection of Quality Elements and Frequency of Monitoring

The fact that 18 out of 20 monitoring sub-programmes are identified as both surveillance and operational monitoring has complicated the analysis of the information as it is not clear which quality elements are monitored in which type of monitoring.

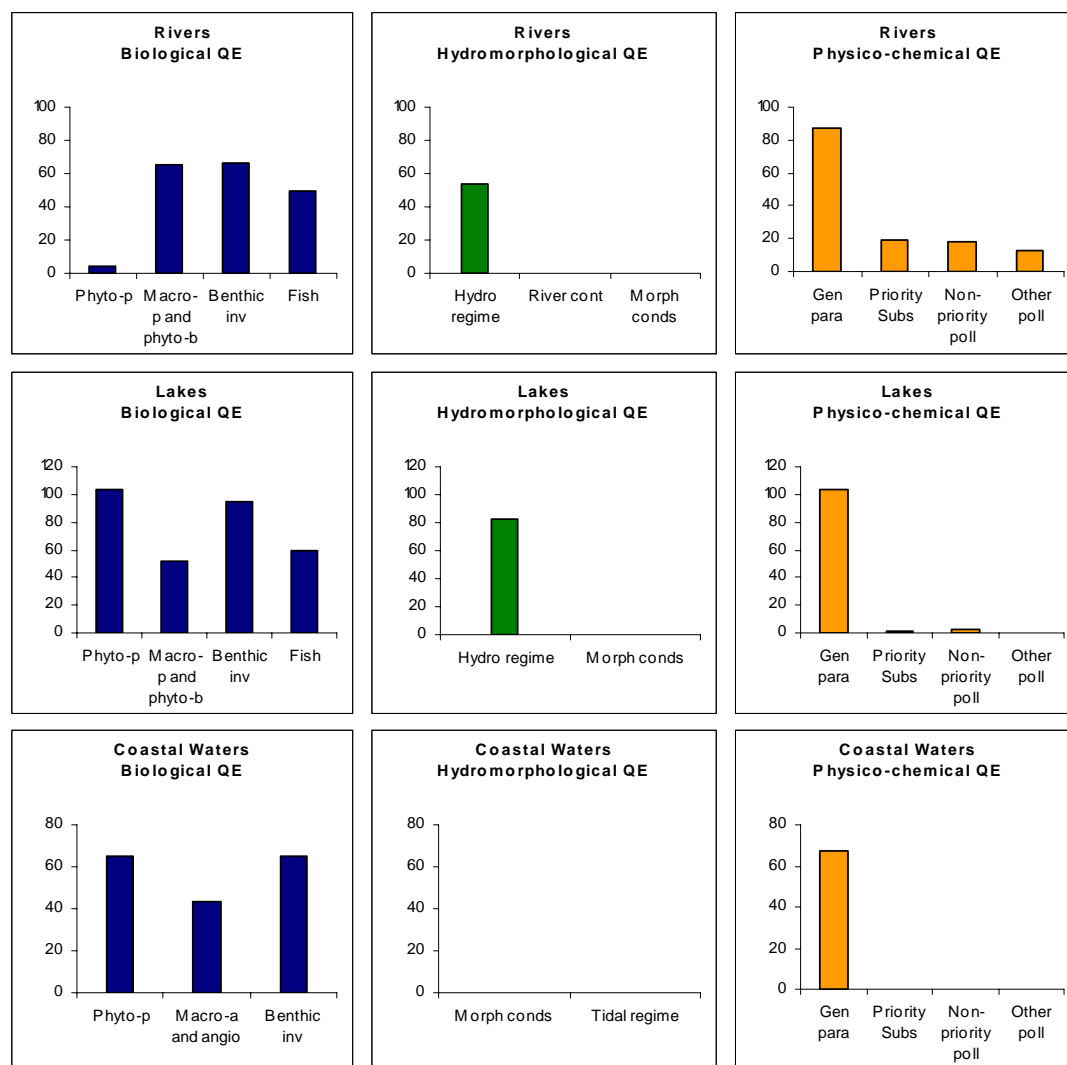
*Surveillance monitoring* is comprehensive in terms of quality elements except for priority substances and other specific pollutants that are monitored in rivers only.

Monitoring of hydromorphological quality elements is very limited in all water categories.

Information reported at the station level indicates that there is often a reduced set of biological quality element for operational monitoring for some river basin districts, although this is not clearly described.

There is no operational monitoring in one of the river basin districts.

### Number of stations where quality elements are monitored (surveillance and operational monitoring) in rivers, lakes, transitional and coastal waters



Monitoring cycles presented in the report varies within the programmes between not decided and every 18 years and *frequency* between once per year to continuous monitoring. There is no general rule reported in determining the monitoring cycle. However, operational monitoring of the biological quality elements is reported to be less than the minimum frequency in the WFD for some or all of the biological quality elements in all river basin districts except one.

## GROUNDWATER MONITORING PROGRAMMES

### Design of Monitoring Programmes

The report indicate that there are two groundwater sub-programmes, both covering some of the selected sites, but it is not clear what the overall rationale is for the two sub-programmes in relation to the objectives of the WFD. The reference reports provide complementary information describing the selection criteria for groundwater monitoring sites.

It is unclear what selection criteria have been taken into account for *operational monitoring*. Three river basin districts do not have an operational monitoring programme. All operational monitoring programmes are also identified as surveillance.

The report for the Åland river basin district only presents one groundwater monitoring programme covering both *quantitative and surveillance monitoring*. The report does not provide information on the design or any reference report. The network includes only 1 station where only groundwater level is monitored.

Although, two of these river basin districts are *international*, there is no mention or information on any transboundary arrangements. The stations reports identify some stations as being used for drinking water abstractions and some of them take part in the WISE-SoE network.

#### Selection of Quality Elements and Frequency of Monitoring

All core *parameters* and other parameters are reported to be monitored under both sub-programme. It is however unclear how these parameters were selected especially regarding the operational monitoring programme.

All groundwater elements are monitored once a year, groundwater level 2 or 24 times in the two sub-programmes respectively. The *frequency* of the monitoring of general parameters and other pollutants is 2 or 4 under the two sub-programmes respectively.

#### **FURTHER INFORMATION**

<http://www.ymparisto.fi/>

#### **SUMMARY OF TECHNICAL ASSESSMENT: STRENGTHS AND WEAKNESSES**

- + Overall good availability of methods for the assessment of ecological status
- Very low number and density of monitoring stations for rivers and lakes. The seven mainland Finnish river basin districts show the lowest density of all river basin districts in the EU.
- Frequency of monitoring for surface waters is in most cases just the minimum required in the WFD

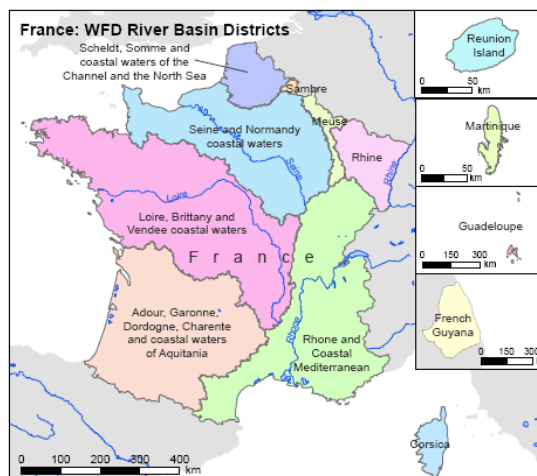
## Member State: FRANCE

## INFORMATION SUPPLIED

France reported through WISE in the agreed format for surface water monitoring and for groundwater monitoring for its 13 river basin districts. A web link for further information was supplied.

## FACTS AND FIGURES

France has a population of 63.4 million (Eurostat 2007) and an area of 642,767 km<sup>2</sup>. France shares with neighbouring countries seven international river basins: Rhone, Adour Garonne, Seine, Rhine, Scheldt, Meuse and Sambre.



## River basin districts and number of water bodies

River Basin District	Surface (km <sup>2</sup> )	% National territory	Number of river water bodies	Number of lake water bodies	Number of transitional water bodies	Number of coastal water bodies	Number of groundwater bodies
Loire	156490	24	730	168	30	39	143
Rhone	120427	19	812	127	36	33	180
Adour Garonne	116475	18	732	105	12	11	105
Seine	93991	15	433	44	6	19	53
Guyane	90000	14	119	1	8	1	12
Rhine	23653	4	469	33	-	-	15
Scheldt	18738	3	119	4	4	5	16
Corsica	8713	1	63	6	4	14	9
Meuse	7787	1	139	5	-	-	11
Reunion	2512	0.4	24	3	-	13	2
Guadeloupe	1780	0.3	40	-	-	10	6
Martinique	1102	0.2	31	0	5	19	6
Sambre	1099	0.2	14	1	-	-	2
<b>France</b>	<b>642767</b>	<b>100</b>	<b>3725</b>	<b>497</b>	<b>105</b>	<b>164</b>	<b>560</b>

**Note:** The Sambre is part of the Meuse international river basin district.

## Number of surveillance, operational and quantitative monitoring stations

River Basin District	Rivers		Lakes		Transitional waters		Coastal waters		Groundwaters		
	Surv	Op	Surv	Op	Surv	Op	Surv	Op	Surv	Op	Quant
Loire	420	531	48	70	16	30	25	21	335	206	409
Rhone	396	572	45	48	12	17	15	8	338	348	313
Adour Garonne	310	295	52	39	11	8	7	3	308	163	369
Seine	216	524	23	45	5	7	12	10	439	301	276
Guyane	0	0	0	0	1	2	1	0	3	0	0
Rhine	80	43	17	0	-	-	-	-	145	83	69
Scheldt	42	32	4	2	2	4	4	5	50	136	68
Corsica	22	24	6	5	4	3	7	6	19	0	35
Meuse	27	9	2	0	-	-	-	-	54	20	17
Reunion	20	10	1	2	-	-	10	2	17	3	22
Guadeloupe	20	16	-	-	-	-	0	0	9	5	22
Martinique	20	8	1	0	3	0	12	6	20	16	29
Sambre	8	5	1	1	-	-	-	-	5	3	5
<b>Total</b>	<b>1581</b>	<b>2069</b>	<b>200</b>	<b>212</b>	<b>54</b>	<b>71</b>	<b>93</b>	<b>61</b>	<b>1742</b>	<b>1284</b>	<b>1634</b>
<b>Total number of monitoring stations</b>	<b>2857</b>		<b>312</b>		<b>85</b>		<b>113</b>		<b>2273</b>		<b>1634</b>

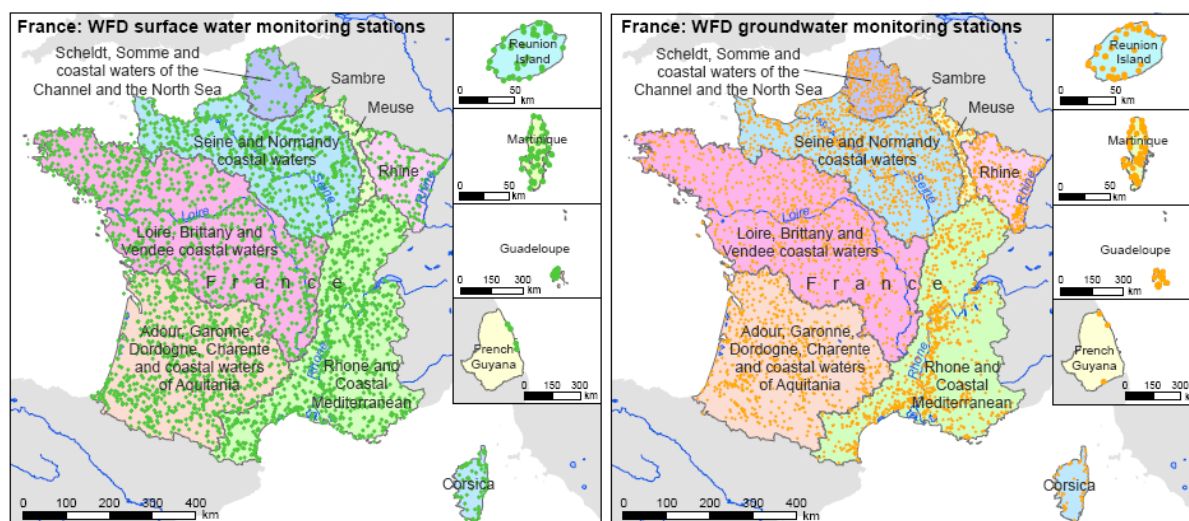
**Note:** Total number of monitoring stations is not necessarily the sum of surveillance and operational as there are stations that serve both purposes

## Number of monitoring stations in protected areas reported under the WFD

River Basin District	Surface water							Ground water
	Bathing Water	Habitats / Birds	Drinking Water	Fish	Shellfish	Nitrates	Urban waste water	Drinking Water
Loire		242	16	17	35	509	858	
Rhone								372
Adour Garonne	11	241			7	124	142	187
Seine	24	87		10	18	514	611	395
Guyane								3
Rhine		2			-	39	112	135
Scheldt	6	8			6	63	60	106
Corsica								18
Meuse		1			-	12	30	55
Reunion	2						11	15
Guadeloupe	4							
Martinique								2
Sambre					-			5
<b>Total</b>	<b>47</b>	<b>581</b>	<b>16</b>	<b>27</b>	<b>66</b>	<b>1261</b>	<b>1824</b>	<b>1293</b>

**Note:** the reporting of monitoring of protected areas under the Water Framework Directive was due only if the information was not reported under other directives. A total of 1950 surface water monitoring stations for nitrates have been reported by France under the nitrates Directive in 2008 (reference period 2004-2007). 3312 surface water monitoring stations were reported under the bathing water directive (bathing season 2007). Those figures are preliminary as quality checking is on-going at the time this report is written.

## Location of surface water and groundwater monitoring stations



## SURFACE WATER MONITORING PROGRAMMES

### Design of Monitoring Programmes

There is a national methodology for surface water monitoring which has been applied across the all river basin districts. Specific sub-programmes have been established for surveillance and the operational monitoring and for each of the relevant water categories, except for rivers and lakes in Guyane and for coastal waters in Guadeloupe, in which the programmes are not yet finalised. Investigative monitoring as well as additional monitoring programmes is foreseen for drinking water protection areas. This covers abstractions of water providing on average more than 100 m<sup>3</sup> per day.

*Surveillance monitoring* is aimed at providing an assessment of the general quality status of surface waters. A network of perennial sites has been established across all river basin districts to provide a long term monitoring of the different aquatic media and to assess the impacts of natural changes (i.e. climate change) and of anthropogenic activities. This programme also contributes to the update of the 2004 analysis of impacts of human activities and to the selection of surface water bodies at risk to be part of the operational network.

*Operational monitoring* focuses on surface water bodies at risk and is based on a first selection of sites which will not reach the objectives in 2015. Operational monitoring will only start in January 2008<sup>4</sup>. The final list of quality elements to be monitored as well as the frequency of monitoring will be specified in the first river basin management plan. For most river basin districts, the number of sites to be monitored for each quality element is not reported. Therefore, it seems that the operational programmes are still under development

There is a clear explanation of how the selection of sub-sites is done and how the water bodies are grouped for monitoring.

<sup>4</sup> An important part of the operational monitoring network was reported to the Commission in an update of information received in October 2008 that complemented the original report of 2007.

*Investigative monitoring* can be established to carry out controls on surface water bodies as soon as one of the following conditions arises: 1. in the event of a water body probably not reaching the environmental objectives and information on the causes is missing; 2. in the event of accident pollution, to determine the extent and the origin of it.

A number of river basin districts have provided information on *monitoring of protected areas*.

Some information on international co-ordination was provided in the Article 8 reports. Some river basin districts are involved in bi-lateral conventions (including for the Moselle and Sarre) and the International Commissions for the Protection of the Rhine, Scheldt and Meuse Rivers. For the latter two active hyperlinks were provided to further information.

#### Development of Biological Assessment Methods

The information provided on the development of biological assessment methods is generally the same across France with some differences in the overseas river basin districts for which the information is incomplete in some cases. The comprehensiveness of the information provided varies depending on the water categories and quality elements. There is no information provided on the *level of confidence and precision*.

For rivers, the methodologies are available for benthic invertebrates, phytobenthos and fish, but the assessment methods for macrophytes are still being developed. Phytoplankton is not monitored in rivers. For lakes, the methods are available for phytoplankton and benthic invertebrates. The assessment method for macrophytes is under development; for fish there are no methods developed. For coastal and transitional waters, the methodologies for macroalgae and angiosperms are reported to be under development. The method for fish in transitional waters is under development and the method for benthic invertebrates in coastal waters is not yet available. In addition, in the overseas reports methods for benthic fauna are missing.

## Summary of available biological assessment methods

	Rivers				Lakes				Transitional Waters				Coastal Waters		
	Phytoplankton	Macrophytes and Phytobenthos	Benthic invertebrates	Fish	Phytoplankton	Macrophytes and Phytobenthos	Benthic invertebrates	Fish	Phytoplankton	Macroalgae and Angiosperms	Benthic invertebrates	Fish	Phytoplankton	Macroalgae and Angiosperms	Benthic invertebrates
Loire	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Rhone	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Adour Garonne	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Seine	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Guyane	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Rhine	■	■	■	■	■	■	■	-	-	-	-	-	-	-	-
Scheldt	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Corsica	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Meuse	■	■	■	■	■	■	■	-	-	-	-	-	-	-	-
Reunion	■	■	■	■	■	■	■	-	-	-	-	■	■	■	■
Guadeloupe	■	■	■	■	-	-	-	-	-	-	-	■	■	■	■
Martinique	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Sambre	■	■	■	■	■	■	■	■	-	-	-	-	-	-	-

Method available ■ Under development or incomplete information ■ Not developed or no information ■ Not relevant -

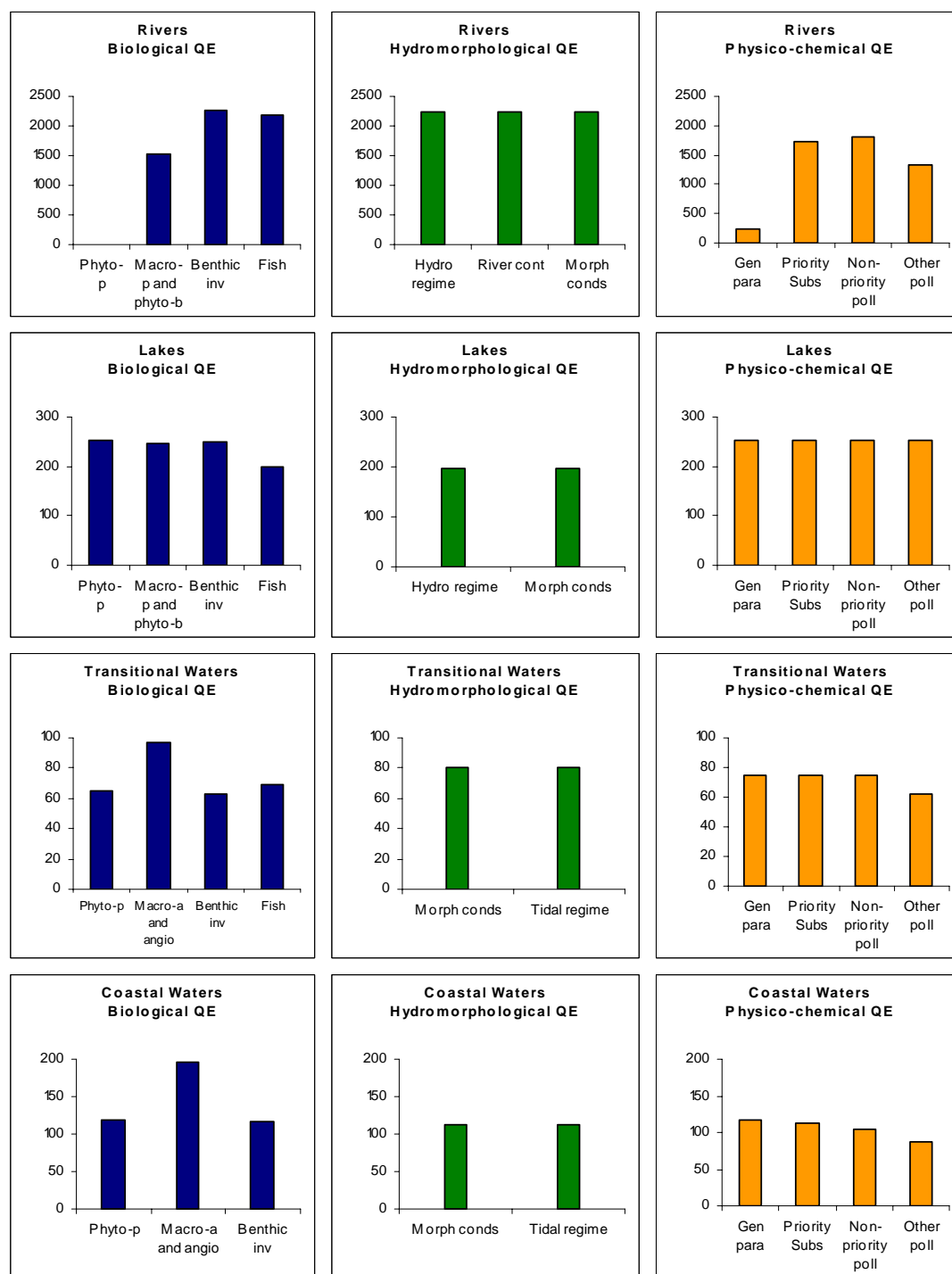
**Note:** In the context of the WFD intercalibration exercise, France has intercalibrated the national assessment methods for macroinvertebrates and phytobenthos in rivers (Central, Alpine and Mediterranean geographical areas) and macroinvertebrates in North-East Atlantic coastal waters and macroalgae in Mediterranean coastal waters. In addition, France has intercalibrated a parameter indicative of biomass of phytoplankton in lakes (Central, Alpine and Mediterranean), a parameter indicative of taxonomic composition and abundance of phytoplankton in Mediterranean lakes (reservoirs only), parameters indicative of biomass of phytoplankton in coastal waters (both Mediterranean and North-East Atlantic), a parameter indicative of blooms in North-East Atlantic coastal waters and a parameter indicative of taxonomic composition of phytoplankton in Mediterranean coastal waters (see Commission Decision 2008/915/EC of 30 October 2008 establishing, pursuant to Directive 2000/60/EC of the European Parliament and of the Council, the values of the Member State monitoring system classifications as a result of the intercalibration exercise, available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:332:0020:0044:EN:PDF>).

### Selection of Quality Elements and Frequency of Monitoring

The surveillance monitoring programmes in Guyane river basin district for rivers and lakes are not yet defined, neither are those for coastal waters in Guadeloupe. For the rest of river basin districts, the surveillance monitoring for rivers and lakes covers all quality elements, except phytoplankton in rivers and in the Loire river basin district, where other aquatic flora in rivers is missing. In transitional waters, other aquatic flora is not monitored in the Escaut, Loire, Seine and Martinique river basin districts. In the latter district, phytoplankton is also not measured in transitional waters.

For operational monitoring, the reports for most of the river basins indicate that the quality elements to monitor are not yet decided. However, they indicate that there will be a targeted approach in selecting the various quality elements according to existing pressures.

**Number of stations where quality elements are monitored (surveillance and operational monitoring) in rivers, lakes, transitional and coastal waters**



The *frequency* for surveillance monitoring varies depending on the water categories and the quality elements. For rivers, macroinvertebrates are measured every year, while aquatic flora and fish are monitored every second year and priority substances every 3 years. In lakes all quality elements are monitored every 6 years. Transitional waters are monitored for biological quality elements every 3 or 6 years except for fish that is monitored every second year. In coastal waters phytoplankton is monitored every year and the rest of biological quality

elements every 3 or 6 years. Priority substances in coastal and transitional waters are monitored every 6 years.

The monitoring cycle of operational monitoring is indicated to be every year for biological quality elements and priority substances in rivers, every three years for lakes and very variable (from every year to every 6 years) for transitional and coastal waters. However, as indicated above for most river basin districts there is no indication of the number of stations and therefore it appears as if the operational monitoring were under development.

## GROUNDWATER MONITORING PROGRAMMES

### Design of Monitoring Programmes

There is a national methodology for groundwater monitoring which has been applied across all the 13 river basin districts. The design of surveillance and quantitative monitoring networks are based on a number of perennial sites to ensure a long-term assessment. The minimum density of the networks (per km<sup>2</sup>) has been defined at the national level and depends on the type of groundwater body. In each river basin district, specific sub-programmes and networks have been established for quantitative, surveillance and operational monitoring of groundwater.

For the *quantitative monitoring*, it is reported that the pressures have influenced the density of the network.

According to the textual information in the report, *surveillance monitoring* is divided into 2 sub-programmes: one extensive programme covering a large selection of parameters and one more intensive programme covering a more limited list of parameters. This division is however not reflected in the information provided for the monitoring programmes, which indicate annual monitoring of all parameters. The density of the monitoring networks depends on the water body characteristics. It is not explicitly mentioned in the reports how the results of the 2004 pressures and impact analysis have been used in the design of the surveillance monitoring programme. There is no reference to the criteria for surveillance monitoring given in the Directive.

*Operational monitoring* is focused on groundwater bodies at risk and is designed to detect the impacts from existing pressures and measures. Long-term trends are not mentioned as a design criterion. Operational monitoring will only start in 2008 to ensure that the list of sites is completely based on the results of the first surveillance monitoring campaign.

Some river basin districts have not yet selected monitoring sites.

There is no information provided on additional requirements for monitoring drinking water *protected areas*.

There is no information in the reports on the specific arrangements for *international coordination* of transboundary groundwater bodies although there are seven international river basin districts in France.

### Selection of Quality Elements and Frequency of monitoring

For surveillance monitoring, the reports indicate that the monitoring programmes are comprehensive and that *all parameters* are covered. For operational monitoring, the reports indicate that there is a targeted approach in selecting the various quality elements depending on the pressures to which the water body is subject. These will be selected after the first results of surveillance monitoring.

The *frequency* for quantitative monitoring is reported to be every year across all the river basin districts. The number of measurements per year varies depending on the type of groundwater body. For sedimentary groundwater bodies the monitoring is carried out at least twice a year and varies from once a month to once a day for the other types of groundwater bodies.

Chemical surveillance monitoring is carried out for all parameters once per year. The frequency varies depending on the type of groundwater body: once a year for sedimentary groundwater bodies and twice a year for the other types of groundwater bodies.

According to the information provided, only nitrates and other specific pollutants are monitored in operational monitoring at least once per year.

### **FURTHER INFORMATION**

<http://www.surveillance.eaufrance.fr/>

### **SUMMARY OF TECHNICAL ASSESSMENT: STRENGTHS AND WEAKNESSES**

- + Quality of the report
- + Frequency of surveillance monitoring in rivers is higher than the minimum required in the WFD
- No monitoring programmes have been established for rivers and lakes in Guyane nor for coastal waters in Guadeloupe
- Operational monitoring started later than the required in the WFD and from the report still appears to be under development

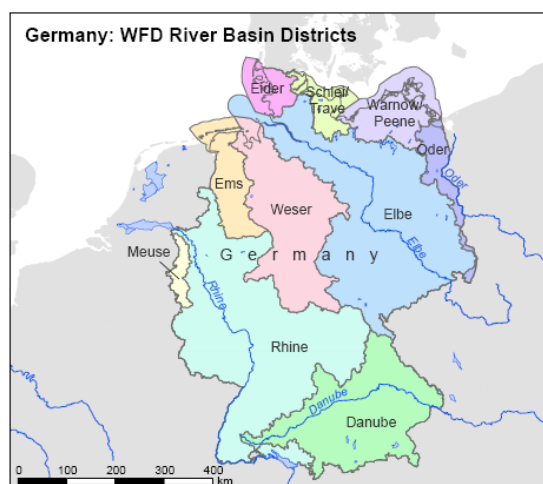
**Member State: GERMANY****INFORMATION SUPPLIED**

Germany has reported through WISE in the agreed format for its ten river basin districts. For all river basin districts a reference was made to the main website which includes more detailed reports on the surface water and groundwater monitoring programmes.

**FACTS AND FIGURES**

Germany has a population of 82.3 million (Eurostat 2007) and an area of 358 622 km<sup>2</sup>. Germany shares with neighbouring countries eight international river basins: Rhine, Elbe, Danube, Ems, Oder, Schlei/Trave, Eider and Meuse.

All river basin districts except one (Eider) span across two or more "Länder" (federal states).

**River Basin Districts and number of water bodies**

River Basin District	Surface (km <sup>2</sup> )	% National territory	Number of river water bodies	Number of lake water bodies	Number of transitional water bodies	Number of coastal water bodies	Number of groundwater bodies
Rhine	102809	29	2255	69	-	-	432
Elbe	97175	27	2779	434	1	5	217
Danube	56295	16	655	51	-	-	49
Weser	49000	14	1384	27	1	6	167
Ems	15008	4	500	6	2	6	40
Warnow/Peene	13645	4	473	83	-	20	38
Oder	9756	3	441	51	-	1	19
Schlei/Trave	6184	2	217	51	-	25	19
Eider	4757	1	137	16	1	11	23
Meuse	3993	1	227	1	-	-	32
<b>Germany</b>	<b>358622</b>	<b>100</b>	<b>9068</b>	<b>789</b>	<b>5</b>	<b>74</b>	<b>1036</b>

## Number of surveillance, operational and quantitative monitoring stations

River Basin District	Rivers		Lakes		Transitional waters		Coastal waters		Groundwaters		
	Surv	Op	Surv	Op	Surv	Op	Surv	Op	Surv	Op	Quant
Rhine	100	1641	5	39	-	-	-	-	1776	966	1327
Elbe	42	2318	28	349	2	2	4	3	1469	1357	4083
Danube	39	92	12	6	-	-	-	-	513	54	176
Weser	43	895	2	26	2	2	4	4	1151	774	897
Ems	9	137	0	5	2	3	4	4	340	390	489
Warnow/Peene	7	65	9	74	-	-	4	34	72	86	264
Oder	4	323	6	43	-	-	1	1	97	68	853
Schlei/Trave	9	105	6	37	-	-	10	16	79	32	438
Eider	3	63	0	5	1	0	7	8	75	52	196
Meuse	4	89	0	1	-	-	-	-	110	200	237
<b>Total</b>	<b>260</b>	<b>5728</b>	<b>68</b>	<b>585</b>	<b>7</b>	<b>7</b>	<b>34</b>	<b>70</b>	<b>5682</b>	<b>3979</b>	<b>8960</b>
<b>Total number monitoring stations</b>	<b>5952</b>		<b>644</b>		<b>11</b>		<b>81</b>		<b>7611</b>		<b>8960</b>

## Notes:

1. The above figures represent the monitoring stations reported through WISE. In a consultation carried out shortly before publishing this report, it was communicated that the actual operational monitoring stations in rivers in the Rhine river basin district were 3155, and the operational monitoring for rivers and lakes in the Danube were respectively 601 and 24. The smaller numbers reported in WISE were due to the grouping made for reporting purposes by the Länder of Bayern, Baden-Württemberg and Rheinland-Pfalz (see below the section Design of monitoring programmes for surface waters).

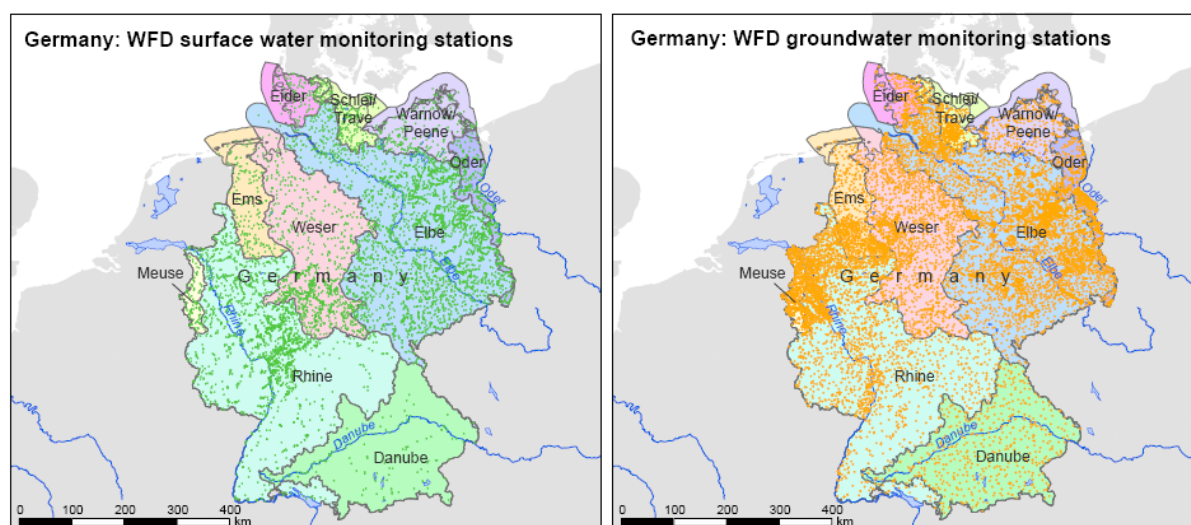
2. Total number of monitoring stations is not necessarily the sum of surveillance and operational as there are stations that serve both purposes

## Number of monitoring stations in protected areas reported under the WFD

River Basin District	Surface water							Ground water
	Bathing water	Habitats / Birds	Drinking water	Fish	Shellfish	Nitrates	Urban waste water	Drinking water
Rhine	543	266	281	397	-	1370	1574	543
Elbe	555	1070	205	279	2	2091	2092	74
Danube	350	91	11	16	-		27	235
Weser	209	210	148	105	1	973	973	395
Ems	90	31	5	38	2	159	159	74
Warnow/Peene	208	160	51	7		193	193	2
Oder	70	245	29	18		345	345	
Schlei/Trave	211	58	1	6	3	151	147	
Eider	61	29		2	9	68	69	
Meuse	13	24	2	65	-	94	94	41
<b>Total</b>	<b>2310</b>	<b>2184</b>	<b>733</b>	<b>933</b>	<b>17</b>	<b>5444</b>	<b>5673</b>	<b>1364</b>

**Note:** the reporting of monitoring of protected areas under the Water Framework Directive was due only if the information was not reported under other directives. A total of 184 surface water monitoring stations for nitrates have been reported by Germany under the nitrates Directive in 2008 (reference period 2004-2007). 2310 surface water monitoring stations were reported under the bathing water directive (bathing season 2007). Those figures are preliminary as quality checking is on-going at the time this report is written.

### Location of surface water and groundwater monitoring stations



**Note:** In Southern Germany (Länder of Bayern, Baden-Württemberg and Rheinland-Pfalz) the surface water monitoring stations appear to be less dense, because the operational monitoring stations have been aggregated to so-called "information points" (see below the section Design of monitoring programmes for surface waters). The actual monitoring sites cannot be depicted as the coordinates of those have not been reported.

## SURFACE WATER MONITORING PROGRAMMES

### Design of Monitoring Programmes

The sub-programmes for *surveillance monitoring* have been established for all relevant water categories in the ten river basin districts. The programme design criteria have been summarised. The main criteria are listed, including supplementation and validation of the pressure and impact analysis, as well as status and trend analyses to assess natural and anthropogenic changes, and including the impact of programmes of measures.

The *operational monitoring* sub-programmes have been established for all relevant water categories and the design criteria summarised. The main objective is to ascertain the status of water bodies at risk on the basis of pressure-related criteria. In addition, the programmes have been designed to supplement status and trend data, to monitor specific discharges (e.g. industrial), and to inform the design of programmes of measures and their impact. The programmes are kept flexible, allowing adjustments to be made in the light of new information, e.g. changes in status (impact of control measures, local conditions, etc.).

The Länder of Bayern, Baden-Württemberg and Rheinland-Pfalz (Rhine and Danube river basin districts) have not provided information on the actual monitoring stations for operational monitoring but have grouped those into "virtual" monitoring stations called "information points". These reduced numbers of monitoring stations reported in WISE have been used for the calculation of the indicators in this report. This practice, which purpose is unclear, has altered the results of some of the indicators for Germany.

General information is provided on *investigative monitoring*. There is a brief summary of the successful establishment and operation of the 'Rhine Alarm Monitoring Programme' following the 1986 Sandoz pollution incident. The Danube river basin district report includes a link to the ICPDR (International Commission for the Protection of the Danube River) where

information on the AEWS (Accident Emergency Warning System) and an accident risk spot inventory can be found.

The reports provide information on the stations located in *drinking water protected areas*. All except the Eider and the Schlei/Trave river basin districts, which do not have any surface water abstraction for the provision of drinking water supplies, mention targeted monitoring strategies for sites where there is  $>100\text{m}^3/\text{d}$  drinking water abstraction. This includes monitoring of all *priority substances* if discharged into the water, and other substances discharged in significant quantities, which could affect the water quality and which are required to be monitored under the Drinking Water Directive. These requirements are combined and incorporated into other monitoring requirements.

The design of the monitoring sub-programmes takes into account the requirements of other EU directives and international commitments where appropriate. The *international co-ordination* of the monitoring programmes is carried out by bi-lateral conventions (including for the Mosel and Saar, Wadden Sea, Bodensee, HELCOM's PLC, OECD, OSPAR's JAMP) and the International Commissions for the Protection of the Danube, Rhine and Elbe Rivers. The relevance of EU directives and international monitoring networks in relation to international river basin districts is indicated for each monitoring site, and a brief summary of the coordination through the international conventions, where relevant, is provided. Coordination in relation to other relevant international agreements is usually referred to in general terms.

#### Development of Biological Assessment Methods

Some reports include full details on the *biological assessment methods* and include information where methods are still under development or in the testing phase. For some of the river basin districts, though, the information is incomplete or missing.

In some reports, brief information on the *levels of confidence and precision* is included.

## Summary of available biological assessment methods

	Rivers				Lakes				Transitional Waters				Coastal Waters		
	Phytoplankton	Macrophytes and Phytobenthos	Benthic invertebrates	Fish	Phytoplankton	Macrophytes and Phytobenthos	Benthic invertebrates	Fish	Phytoplankton	Macroalgae and Angiosperms	Benthic invertebrates	Fish	Phytoplankton	Macroalgae and Angiosperms	Benthic invertebrates
Rhine	■	■	■	■	■	■	■	■	-	-	-	-	-	-	-
Elbe	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Danube	■	■	■	■	■	■	■	■	-	-	-	-	-	-	-
Weser	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Ems	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Warnow/ Peene	■	■	■	■	■	■	■	■	-	-	-	-	■	■	■
Oder	■	■	■	■	■	■	■	■	-	-	-	-	■	■	■
Schlei/ Trave	■	■	■	■	■	■	■	■	-	-	-	-	■	■	■
Eider	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Meuse	■	■	■	■	■	■	■	■	-	-	-	-	-	-	-

Method available ■ Under development or incomplete information ■ Not developed or no information ■ Not relevant -

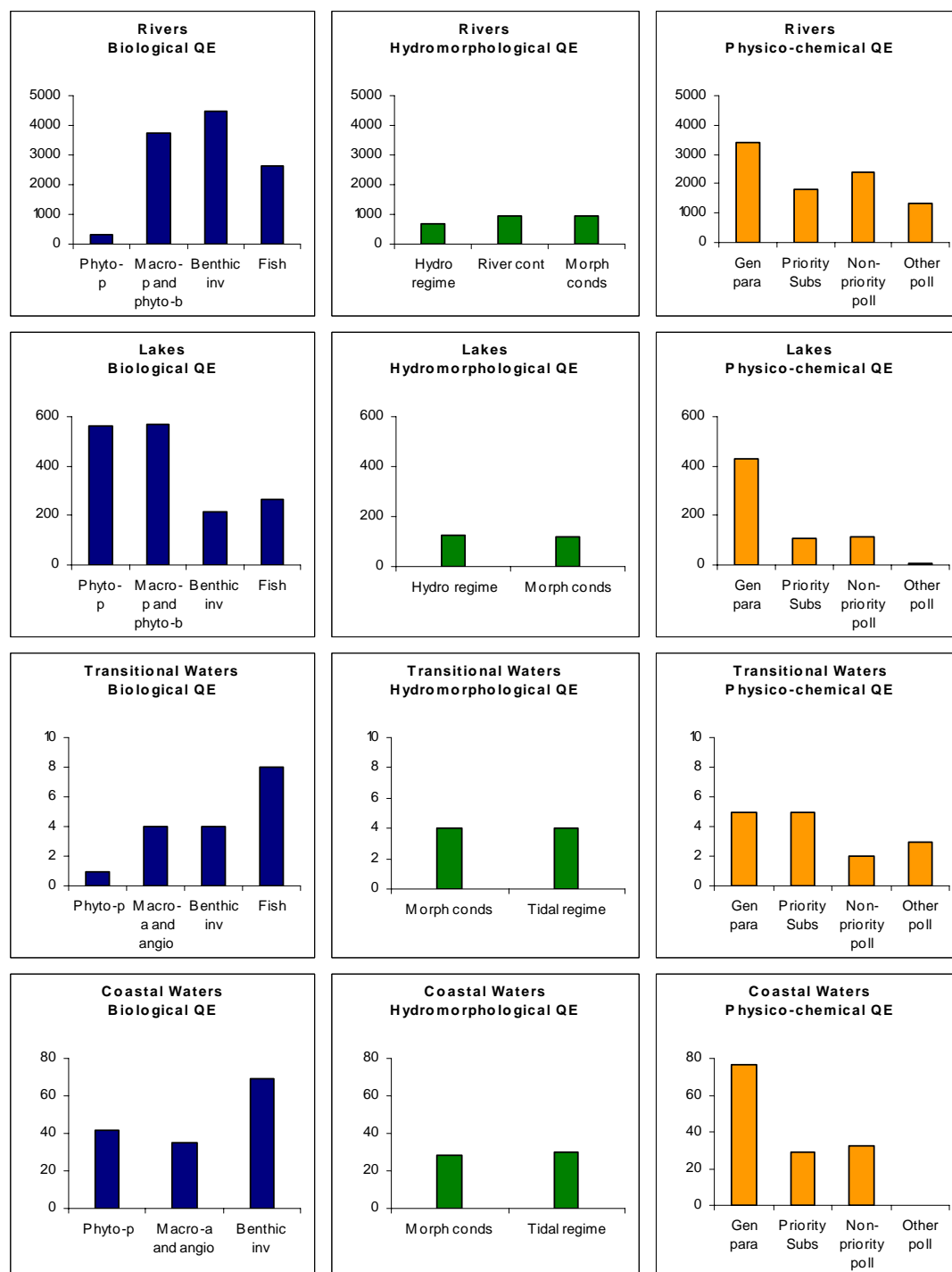
**Note:** In the context of the WFD intercalibration exercise, Germany has intercalibrated the national assessment methods for macroinvertebrates and phytobenthos in rivers (Alpine and Central geographical areas), macrophytes in lakes (Alpine and Central) and macroinvertebrates in coastal waters (North-East Atlantic). In addition, Germany has intercalibrated a parameter indicative of biomass and taxonomic composition and abundance of phytoplankton in lakes (Alpine), a parameter indicative of biomass of phytoplankton in lakes (Central), a parameter indicative of biomass of phytoplankton in coastal waters (Baltic Sea and North-East Atlantic), a parameter indicative of blooms of phytoplankton (North-East Atlantic) and a parameter indicative of abundance of angiosperms in coastal waters (depth limit, in the Baltic Sea) (see Commission Decision 2008/915/EC of 30 October 2008 establishing, pursuant to Directive 2000/60/EC of the European Parliament and of the Council, the values of the Member State monitoring system classifications as a result of the intercalibration exercise, available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:332:0020:0044:EN:PDF>).

### Selection of Quality Elements and Frequency of Monitoring

The *selection of quality elements* in surveillance monitoring in rivers is comprehensive, covering all quality elements. In lakes, monitoring covers all quality elements except priority substances and other specific pollutants in the river basin districts of Oder and Warnow/Peene, and other specific pollutants in the Rhine. Monitoring of phytoplankton in transitional waters is missing in the Ems, Weser and Elbe river basin districts whereas other specific pollutants are not included in the Ems and Weser. The coverage of quality elements for coastal waters is comprehensive.

The *frequency* of monitoring varies a great deal, with monitoring of many quality elements still to be decided. Where decided, the frequencies are on the whole in compliance with minimum WFD requirements or higher, with few exceptions.

**Number of stations where quality elements are monitored (surveillance and operational monitoring) in rivers, lakes, transitional and coastal waters**



**GROUNDWATER MONITORING PROGRAMMES**

Design of Monitoring Programmes

*Surveillance, operational and quantitative monitoring programmes* have been established in all ten river basin districts.

The selection of sites is generally driven by hydrogeological/geological conditions, pressures (water usage, land use, and properties of potential pollutants), connections with surface waters and, where relevant (i.e. at risk) dependent terrestrial ecosystems. The sites are selected to be representative of the water bodies and to enable trend assessment.

In those water bodies that were characterised in the pressure and impact analysis as 'at risk' or 'unclear', monitoring density is increased. The programmes will be optimised according to monitoring results.

The report indicates those monitoring stations that are located in drinking water *protected areas*.

There is a reference to *international cooperation* or cooperation between "Länder" on groundwater bodies near the border.

### Selection of Quality Elements and Frequency of Monitoring

All *core parameters* and '*other pollutants*' are monitored, the latter are selected according to existing pressures.

The *frequency* of quantitative monitoring is mainly once per year, except in the Rhine river basin district, that reports to monitor once every 6 years, and in the Warnow/Peene, that is not yet decided. The reports indicate that the frequency may be optimised later according to results obtained.

In general, the frequency of chemical surveillance monitoring is at least once a year, except in the Weser, every 2 years, in the Rhine, Eider and Schlei/Trave, every 3 years and in the Elbe, every 6 years. Operational monitoring is carried out also at least once per year except in the Rhine, every 2 years and in the Elbe, every 4 years. The reports indicate that the frequency may vary in the future for individual water bodies and/or parameters depending on results obtained in the first years.

No information is reported on the quality elements or their monitoring frequency in the Warnow/Peene river basin district.

### **FURTHER INFORMATION**

The main website given for all river basin districts is:

<http://www.wasserblick.net/servlet/is/34778/>

### **SUMMARY OF TECHNICAL ASSESSMENT: STRENGTHS AND WEAKNESSES**

- + Quite comprehensive information on monitoring of protected areas
- + Overall high density of monitoring stations both for surface and groundwater
- + International coordination
- Reporting detail and quality very variable, in particular in the reporting of methods for the assessment of ecological status
- Grouping of operational monitoring stations in “information points”

Member State: GREECE

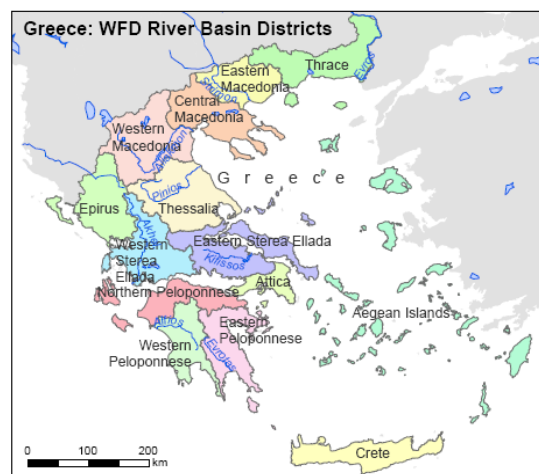
INFORMATION SUPPLIED

Greece has not reported on its monitoring programmes for surface and groundwater.

FACTS AND FIGURES

Greece has a population of 11.2 million and an area of 131,966 km<sup>2</sup>.

Greece shares the following five international river basins with neighbouring countries: Western Macedonia, Thrace, Central Macedonia, Epirus and Eastern Macedonia.



River basin districts and number of water bodies

River Basin District	Surface (km <sup>2</sup> )	% National territory	Number of river water bodies	Number of lake water bodies	Number of transitional water bodies	Number of coastal water bodies	Number of groundwater bodies
Western Macedonia (09)	13440	10	67	10	2	2	16
Thessalia (08)	13377	10	96	2	0	5	21
Eastern Sterea Ellada (07)	12341	9	84	3	1	19	25
Thrace (12)	11177	8	91	3	5	12	8
Central Macedonia (10)	10390	8	85	4	1	10	12
Western Sterea Ellada (04)	10199	8	102	12	3	7	14
Epirus (05)	10026	8	94	4	5	14	17
Aegean Islands (14)	9104	7	55	0	4	86	37
Eastern Peloponnese (03)	8477	6	62	0	0	13	21
Crete (13)	8336	6	3	3	0	21	15
Northern Peloponnese (02)	7310	6	83	3	4	18	14
Western Peloponnese (01)	7301	6	95	1	2	12	19
Eastern Macedonia (11)	7281	6	47	2	1	4	12
Attica (06)	3207	2	13	1	0	11	10
<b>Greece</b>	<b>131966</b>	<b>100</b>	<b>977</b>	<b>48</b>	<b>28</b>	<b>234</b>	<b>241</b>

Member State: HUNGARY

INFORMATION SUPPLIED

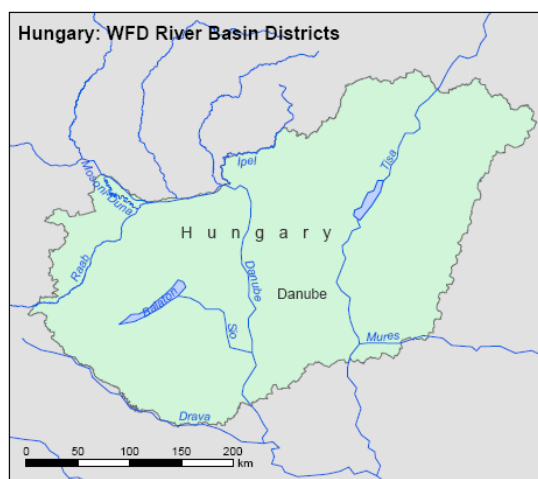
Information was timely provided in WISE in the agreed format together with a supplementary summary report containing basic statistics and information on the monitoring programmes. A weblink to further information was also provided. The report covers the only river basin district of Hungary, the international Danube river basin district.

FACTS AND FIGURES

Hungary has a population of 10 million (Eurostat, 2007) and an area of 93,030 km<sup>2</sup>.

Hungary is entirely situated within the Danube international river basin.

Hungary has no transitional or coastal waters.



River basin districts and number of water bodies

River Basin District	Surface (km <sup>2</sup> )	% National territory	Number of river water bodies	Number of lake water bodies	Number of transitional water bodies	Number of coastal water bodies	Number of groundwater bodies
Danube	93030	100	891	221	-	-	108
<b>Hungary</b>	<b>93030</b>	<b>100</b>	<b>891</b>	<b>221</b>	<b>-</b>	<b>-</b>	<b>108</b>

Number of surveillance, operational and quantitative monitoring stations

River Basin District	Rivers		Lakes		Transitional waters		Coastal waters		Groundwaters		
	Surv	Op	Surv	Op	Surv	Op	Surv	Op	Surv	Op	Quant
Danube	121	307	21	32	-	-	-	-	1742	0	1772
<b>Total</b>	<b>121</b>	<b>307</b>	<b>21</b>	<b>32</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>1742</b>	<b>0</b>	<b>1772</b>
<b>Total number of monitoring stations</b>	<b>338</b>		<b>46</b>		<b>-</b>		<b>-</b>		<b>1742</b>		<b>1772</b>

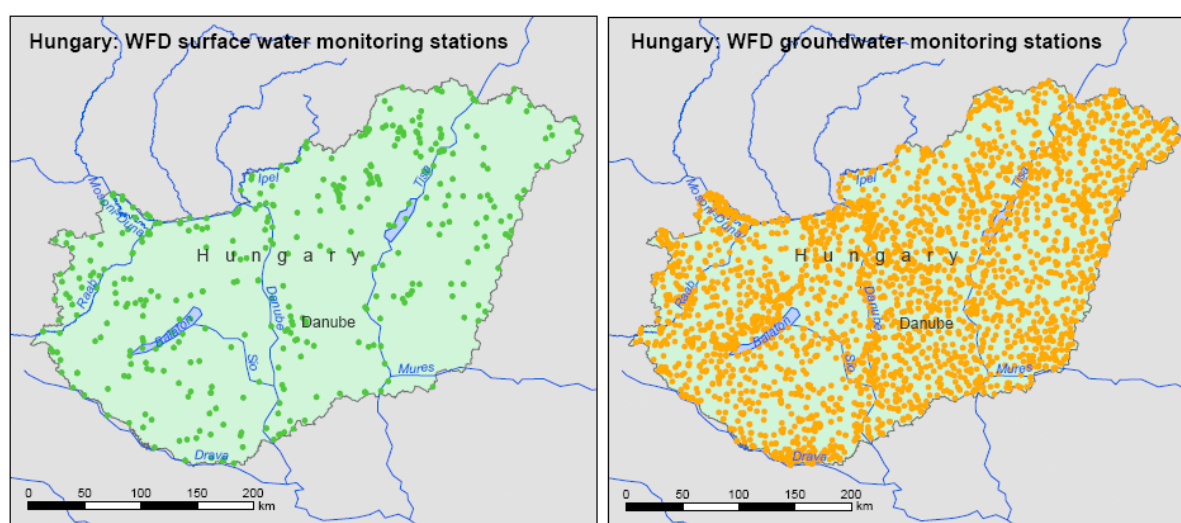
**Note:** Total number of monitoring stations is not necessarily the sum of surveillance and operational as there are stations that serve both purposes

**Number of monitoring stations in protected areas reported under the WFD**

River Basin District	Surface water							Ground water
	Bathing Water	Habitats / Birds	Drinking Water	Fish	Shellfish	Nitrates	Urban waste water	Drinking Water
Danube	30	115	13	23	-	197	27	1154
<b>Total</b>	<b>30</b>	<b>115</b>	<b>13</b>	<b>23</b>	<b>-</b>	<b>197</b>	<b>27</b>	<b>1154</b>

**Note:** the reporting of monitoring of protected areas under the Water Framework Directive was due only if the information was not reported under other directives. A total of 535 surface water monitoring stations for nitrates have been reported by Hungary under the nitrates Directive in 2008 (reference period 2004-2007). 256 surface water monitoring stations were reported under the bathing water directive (bathing season 2007). Those figures are preliminary as quality checking is on-going at the time this report is written.

**Location of surface water and groundwater monitoring stations**



**SURFACE WATER MONITORING PROGRAMMES**

Design of Monitoring Programmes

Hungary has put surveillance, operational and investigative monitoring programmes in place.

*Surveillance monitoring:* 2 sub-programmes for surveillance monitoring are established, one for rivers and one for lakes. It takes account of the validation of the 2004 pressure and impact analysis and the assessment of long-term changes in natural conditions; the needs of the assessment of changes resulting from widespread anthropogenic activity; the full range of status criteria; the volume of water present and sites identified under the Information Exchange Decision.

*Operational monitoring:* 8 sub-programmes for operational monitoring are established. The assessment of water bodies at risk is a clear objective of the operational monitoring programme. The operational monitoring programme is already in place. Monitoring sites for water bodies at risk were selected to represent different impacts such as hydromorphological changes, organic pollution, nutrients and hazardous substances loads.

*Investigative monitoring:* The report provided information about investigative monitoring as well. No specific examples are given.

*Monitoring of protected areas:* The report provides complete information on the monitoring of protected areas. Drinking water protected areas are monitored based on the basis of a ministerial order.

*International coordination:* The report indicates that the selection of the monitoring sites was coordinated with other commitments and provides details of the monitoring networks for those commitments. WISE-SoE sites (formerly EIONET-Water) have been indicated.

Development of Biological Assessment Methods

Sufficient information is given about *methods* of sampling and monitoring methods. The report indicates that the methods of assessment of surface waters ecological status are under development especially for fish and macrozoobenthos. Sampling methods, taxonomy determination and classification methods and reliability of measurements will be determined after field experiences. Numeric information on the *level of confidence* is not available for all assessment methods.

**Summary of available biological assessment methods**

	Rivers				Lakes				Transitional Waters				Coastal Waters		
	Phytoplankton	Macrophytes and Phytobenthos	Benthic invertebrates	Fish	Phytoplankton	Macrophytes and Phytobenthos	Benthic invertebrates	Fish	Phytoplankton	Macroalgae and Angiosperms	Benthic invertebrates	Fish	Phytoplankton	Macroalgae and Angiosperms	Benthic invertebrates
Hungary	■	■	■	■	■	■	■	■	-	-	-	-	-	-	-

Method available ■ Under development or incomplete information ■ Not developed or no information ■ Not relevant -

Selection of Quality Elements and Frequency of Monitoring

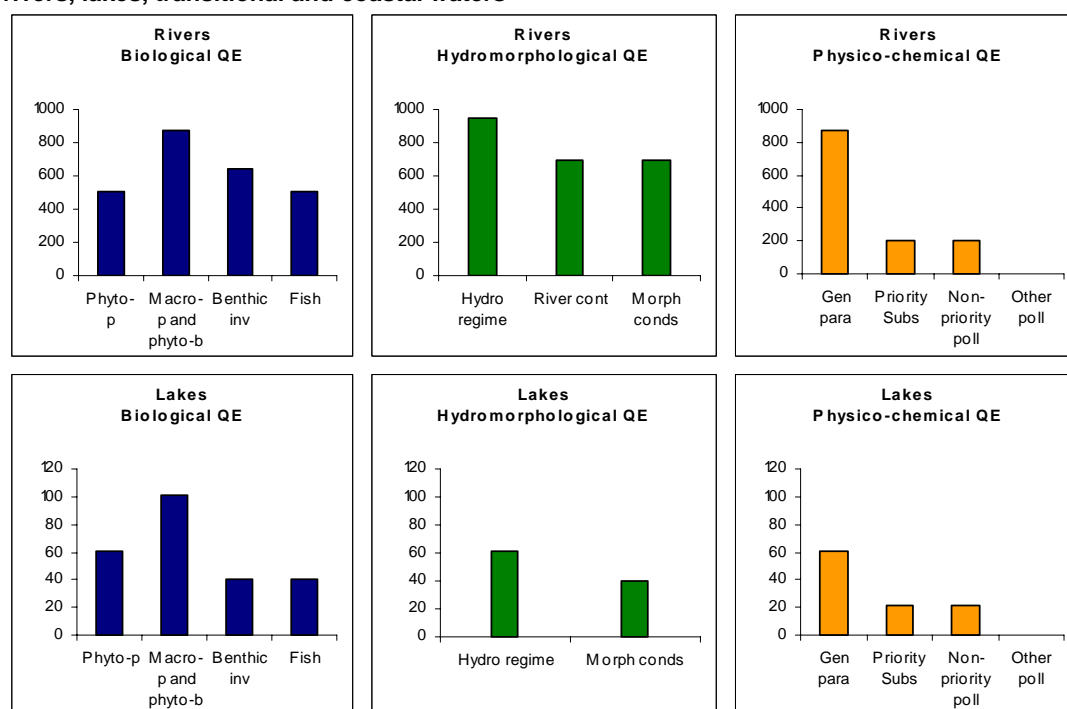
The surveillance monitoring includes all *quality elements* in all water categories. The selection of quality elements for monitoring in operational monitoring is targeted to address existing pressures.

The report indicates differences in *frequencies* and cycle for different monitoring programmes. It gives detailed information for river and lake monitoring for each quality element concerning the number of sites, frequency and cycle.

Surveillance monitoring is carried out every year, between 1 and 6 samples per year, for all biological quality elements except fish, which is monitored once every 6 years. Priority substances are monitored once every 6 years.

Operational monitoring is carried out every year except for fish, which is every 3 years for rivers and every 6 years for lakes. Priority substances are monitored every year in operational monitoring.

**Number of stations where quality elements are monitored (surveillance and operational monitoring) in rivers, lakes, transitional and coastal waters**



**GROUNDWATER MONITORING PROGRAMMES**

Design of Monitoring Programmes

Hungary have put quantitative and surveillance monitoring programmes in place. There is no operational programme established yet.

*Quantitative monitoring:* the 2 programmes take into account the needs of representative network that could characterize the spatial and temporal changes in the groundwater bodies. The density of the network is higher for water bodies at risk for thermal groundwater bodies.

*Surveillance monitoring:* 4 sub-programmes are mentioned in the report. These supplementary ones focus on some specific areas such as karstic waters, thermal waters, some hilly regions and some small creek watersheds and sources.

There is no *groundwater operational monitoring* programme established yet, it will be established based on the results of the complete survey of water bodies carried out in the surveillance monitoring.

*Monitoring of protected areas:* drinking water protected areas are monitored. The report provides information on monitoring of transboundary water bodies, protected areas – such as karstic regions, vulnerable alluvial areas, etc.

*International coordination:* surveillance monitoring programmes include the requirements of bilateral transboundary agreements that Hungary signed with neighbouring countries. The report does not identify the monitoring stations in the WISE-SoE network.

Selection of Quality Elements and Frequency of Monitoring

The report indicates that the surveillance monitoring programmes cover all core *parameters* required in WFD. Monitoring of specific pollutants is not indicated.

Groundwater level is monitored with monthly *frequency* and there is a supplementary quantitative programme for karstic area water bodies, water bodies at some hilly and mountainous areas and for some thermal waters there (4 measurements per year). In case of two surveillance monitoring programmes out of four monitoring is carried out only every second year for three parameters (conductivity, nitrate and ammonium).

**FURTHER INFORMATION**

<http://www.euvki.hu>

**SUMMARY OF TECHNICAL ASSESSMENT: STRENGTHS AND WEAKNESSES**

- + Clear report of good quality
- + Comprehensive information on monitoring of protected areas
- + Extensive groundwater surveillance monitoring
- + Frequency of monitoring well beyond the minimum required in the WFD
- Density of monitoring stations for rivers and lakes seems low (although monitored every year)



## Number of surveillance, operational and quantitative monitoring stations

River Basin District	Rivers		Lakes		Transitional waters		Coastal waters		Groundwaters		
	Surv	Op	Surv	Op	Surv	Op	Surv	Op	Surv	Op	Quant
Shannon	46	602	17	34	5	7	0	2	51	28	25
South Eastern	33	536	0	5	6	9	1	4	71	39	42
Western	31	423	26	38	6	12	3	4	31	15	37
South Western	30	391	7	16	3	16	3	5	33	24	8
North Western	20	262	19	42	3	4	3	3	5	1	5
Eastern	15	244	6	10	2	6	1	4	20	7	16
Neagh Bann	5	66	1	4	1	2	1	1	8	2	7
<b>Total</b>	<b>180</b>	<b>2524</b>	<b>76</b>	<b>149</b>	<b>26</b>	<b>56</b>	<b>12</b>	<b>23</b>	<b>219</b>	<b>116</b>	<b>140</b>
<b>Total number of monitoring stations</b>	<b>2724</b>		<b>198</b>		<b>84</b>		<b>33</b>		<b>219</b>		<b>140</b>

**Note:** Total number of monitoring stations is not necessarily the sum of surveillance and operational as there are stations that serve both purposes

## Number of monitoring stations in protected areas reported under the WFD

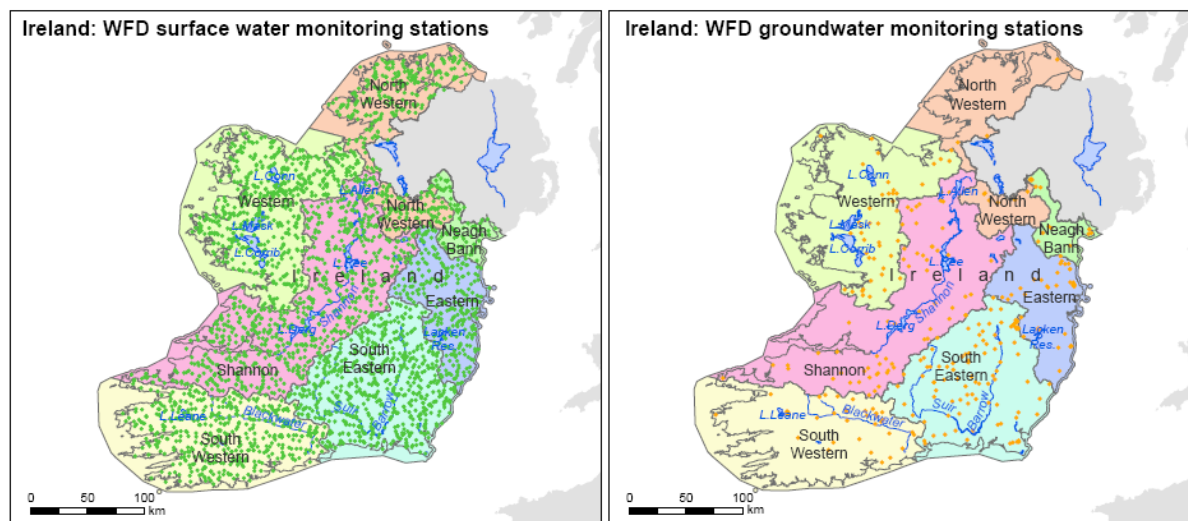
River Basin District	Surface water							Ground water
	Bathing Water	Habitats / Birds	Drinking Water	Fish	Shellfish	Nitrates	Urban waste water	Drinking Water
Shannon	4	133	49			-	23	51
South Eastern		257	17			-	52	67
Western	1	206	54	2	11	-	6	24
South Western		172	30		2	-	22	30
North Western		102	28		1	-	4	5
Eastern	1	77	18			-	14	18
Neagh Bann		3	6			-	9	8
<b>Total</b>	<b>6</b>	<b>950</b>	<b>202</b>	<b>2</b>	<b>14</b>	<b>-</b>	<b>130</b>	<b>203</b>

**Notes:**

1. The reporting of monitoring of protected areas under the Water Framework Directive was due only if the information was not reported under other directives. A total of 385 surface water monitoring stations for nitrates have been reported by Ireland under the nitrates Directive in 2008 (reference period 2004-2007). 131 surface water monitoring stations were reported under the bathing water directive (bathing season 2007). Those figures are preliminary as quality checking is on-going at the time this report is written.

2. Ireland has established and applies action programmes in the whole of its territory and therefore, in accordance to article 3.5 of the Nitrates Directive 1991/676/EEC, it is exempted from designation of specific vulnerable zones.

### Location of surface water and groundwater monitoring stations



## SURFACE WATER MONITORING PROGRAMMES

### Design of Monitoring Programmes

There are surveillance and operational monitoring programmes established in Ireland.

The Irish surface water monitoring programme is divided into 4 subprogrammes for each river basin district, one for each water category. Each sub-programme is further subdivided into sub-networks each designed to fulfil one or more of the main objectives of *surveillance monitoring*.

The report on the WFD monitoring programmes provides a clear overview of the main design criteria.

In *operational* monitoring there are subnets of sites for assessing the effectiveness of measures to control and reduce point source, diffuse source and hydromorphological pressures and also to monitor whether high and good status water bodies could deteriorate in quality.

*Investigative monitoring* is planned for rivers and lakes.

There are specific subprogrammes for *protected areas*. There are sub-nets for species and habitats protected areas in all water categories. There is also additional monitoring for drinking water abstraction areas.

There is a clear attempt to integrate the monitoring networks from different Directives into a coherent framework.

*International coordination*: the report on EPA website describes the common work that has been done with the UK to inform the design of the network. Reference is also made to WISE-SoE and OSPAR.

## Development of Biological Assessment Methods

There is information provided on the status of development of the assessment methods and metric for the biological quality elements for rivers, coastal and transitional waters. The report states that all biological quality elements for lakes are under development.




The report on the EPA website provides some information about the assessment methods in use for all water categories, some of which have been developed together with the UK. The information is spread in several chapters (2.6, 7.2.8, 8.3.9 and 9.3.1-5) and the information is not always consistent. For this reason the status of development of the methods is not clear in some cases and it is deemed to be "under development".

Morphological quality elements are reported to be under development for all water categories.

There is a full chapter on quality control and quality assurance for rivers including the use of relevant standard methods etc. There is also a chapter on level of confidence where some confidence estimates are given for some of the most used biological quality elements.

### Summary of available biological assessment methods

	Rivers				Lakes				Transitional Waters				Coastal Waters		
	Phytoplankton	Macrophytes and Phytobenthos	Benthic invertebrates	Fish	Phytoplankton	Macrophytes and Phytobenthos	Benthic invertebrates	Fish	Phytoplankton	Macroalgae and Angiosperms	Benthic invertebrates	Fish	Phytoplankton	Macroalgae and Angiosperms	Benthic invertebrates
Ireland	Not developed or no information	Under development or incomplete information	Method available	Under development or incomplete information	Under development or incomplete information	Under development or incomplete information	Under development or incomplete information	Under development or incomplete information	Method available	Method available	Method available	Under development or incomplete information	Method available	Method available	Method available

Method available  Under development or incomplete information  Not developed or no information  Not relevant -

**Note:** In the context of the WFD intercalibration exercise, Ireland has intercalibrated the national assessment methods for macroinvertebrates and phytobenthos in rivers (Central and Northern geographical areas), macrophytes in lakes (Northern) and macroinvertebrates in coastal waters. In addition, Ireland has intercalibrated a parameter indicative of biomass of phytoplankton in lakes (Atlantic and Northern geographical areas), and in coastal waters parameters indicative of biomass of phytoplankton, a parameter indicative of phytoplankton blooms, a parameter indicative of macroalgae composition and a parameter indicative of angiosperms taxonomic composition and abundance (see Commission Decision 2008/915/EC of 30 October 2008 establishing, pursuant to Directive 2000/60/EC of the European Parliament and of the Council, the values of the Member State monitoring system classifications as a result of the intercalibration exercise, available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:332:0020:0044:EN:PDF>).

## Selection of Quality Elements and Frequency of Monitoring

The fact that all sub-programmes reported are marked as covering both surveillance and operational monitoring and that quality elements are not declared at station level has complicated the analysis of the information reported in WISE as it is not possible to know which quality elements are monitored in which type of monitoring. Some excel sheets available in the EPA website provide more information but these have not been analysed in detail.

From the electronic reporting in WISE, it seems that the selection of quality elements is not comprehensive, but the information is not fully coherent with the report in the EPA website (this has not been thoroughly checked). According to the WISE report, the quality elements monitored in the Neagh Bann river basin district are not defined. Monitoring of fish in lakes is missing in Eastern and South Eastern river basin districts. Other specific pollutants are not monitored in lakes in Eastern river basin district. Monitoring of transitional waters does not cover all quality elements: fish and priority substances are missing in Neagh Bann, North Western and Eastern river basin districts; macroinvertebrates is missing in Eastern; priority substances is missing in Shannon; other specific pollutants is missing in North Western, Eastern and Shannon. In coastal waters all quality elements are monitored except phytoplankton in Shannon. Phytoplankton is not monitored in rivers in any river basin district.

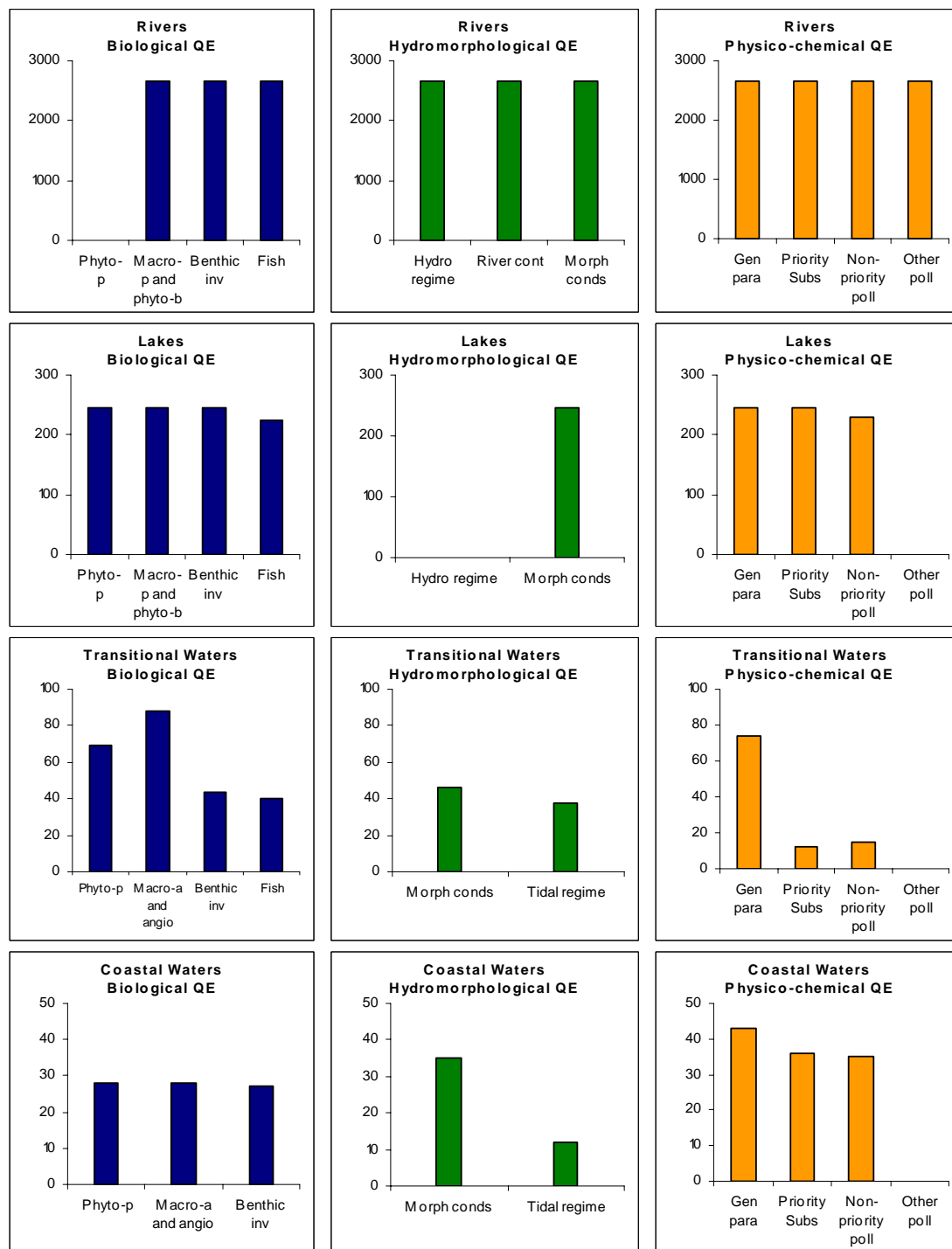
According to the information in the EPA website, rivers surveillance monitoring covers all biological except phytoplankton<sup>5</sup>. Operational monitoring covers macroinvertebrates and fish. For lakes, there is no information about monitoring of biological quality elements other than phytoplankton in the EPA website.

The WISE report indicates that the *monitoring frequency* has not yet been decided. The information in the EPA website indicates that the biological quality elements will be monitored every three years in rivers except macroinvertebrates in seriously polluted water bodies (i.e. bad status) that will be monitored every year.

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<sup>5</sup> The report in the EPA website states that phytoplankton is only relevant in a few Irish rivers because of the short residence times. This quality element is said to be monitored in a few rivers.

**Number of stations where quality elements are monitored (surveillance and operational monitoring) in rivers, lakes, transitional and coastal waters**



**GROUNDWATER MONITORING PROGRAMMES**

Design of Monitoring Programmes

In Ireland, there is a quantitative monitoring programme, a qualitative surveillance monitoring programme, a qualitative operational monitoring programme for groundwater.

The report specifically mentions that the overall objectives of the *quantitative and surveillance monitoring programmes* are to provide information that can be used to supplement and validate the risk assessment analysis and the assessment of long-term trends both as a result of changes in natural conditions and through anthropogenic activity.

The report also clearly states that *operational monitoring* programme is focused on assessing groundwater bodies at risk, establishing the presence of any long-term anthropogenic induced upward trend in the concentration of any pollutant, supporting the design of Programme of Measures and assessing the effectiveness of such measures within groundwater bodies.

The design of the groundwater monitoring network in Ireland is based on key sub-networks; each designed to fulfil one or more of the main objectives of the groundwater monitoring programme.

The report indicates that existing groundwater monitoring locations have been reviewed to determine their suitability for WFD monitoring and where appropriate, these monitoring locations have been integrated into the WFD monitoring programmes. Where necessary, the compliance monitoring may be supplemented by additional monitoring.

It was confirmed that sampling would begin on December 22nd 2006 at all monitoring sites that currently exist, with monitoring beginning at new sites once they are installed in 2007. Ecosystem monitoring will be phased in between 2007-2009, initially focusing on the ecosystems that are known to be at risk and where groundwater is potentially contributing to the ecosystem being damaged. New monitoring points will be installed in the poorly productive aquifers.

The monitoring programme covers *protected areas* used for abstraction of drinking water. The monitoring programme also covers protected areas such as Habitats Protection Areas or groundwater dependent terrestrial ecosystems.

Monitoring is proposed in groundwater bodies that were identified as being at risk because of associated terrestrial ecosystem. Monitoring is also proposed in groundwater bodies associated with terrestrial ecosystems that are considered to be high status ecosystems. The proposed monitoring will be phased over three years its results will provide the basis for future terrestrial ecosystem monitoring.

Ecological monitoring associated with the Habitats Directive will be required in conjunction with chemical and quantitative groundwater monitoring.

The report also mentions that specific arrangements have been made for *transboundary groundwater bodies* and that monitoring programmes are being designed to coincide with monitoring in Northern Ireland, so an assessment can be made of the rate and direction of flow across Member State boundaries.

As with surface water, there is a clear concept to integrate networks coming from different obligations.

### Selection of Quality Elements and Frequency of Monitoring

The proposed *quality elements* for monitoring cover all the required elements for quantitative and surveillance monitoring. Additional elements selected on a case-by-case basis will also be monitored for operational monitoring depending on the pressures identified in the risk assessment.

In addition to monitoring water levels, information on groundwater abstraction and discharge rates is also required to determine the quantitative status of groundwater bodies.

There are operational monitoring subnets for assessing the effectiveness of measures for dealing with point, diffuse and urban pollution sources/pressures.

The information on frequency is not included in the WISE electronic report but in a separate word document uploaded in WISE. The report provides information on monitoring *frequency* for the first 3 years.

The monitoring frequency for surveillance monitoring varies between 4 and 2 times a year and for operational monitoring between 12 and 4 times a year and for quantitative monitoring data loggers downloaded should take place between 6 and 2 times a year. The installation of data loggers to measure water level is proposed at all quantitative monitoring locations.

Operational monitoring will be carried out between periods of surveillance monitoring and samples will be taken, as a minimum, at least once a year. Higher frequencies are proposed where the existing data is not sufficient.

### **FURTHER INFORMATION**

<http://www.epa.ie/whatwedo/wfd/monitoring/programme/>

### **SUMMARY OF TECHNICAL ASSESSMENT: STRENGTHS AND WEAKNESSES**

- + Clear concept for developing the monitoring programmes following WFD requirements
- + Integration of monitoring of protected areas for surface and groundwaters
- + High density of monitoring stations
- + Coordination with United Kingdom in development of methods and monitoring programmes
- Reporting on methods for the assessment of ecological status not clear
- The electronic reporting is almost empty as regards methods and design considerations, largely referring to the paper report
- All methods for lakes appear to be under development
- Reporting of monitoring frequencies is not clear but it appears hardly beyond the minimum recommended in the WFD

**Member State: ITALY**

**INFORMATION SUPPLIED**

Italy has submitted eight reports through WISE in the agreed format, covering all eight of its river basin districts. While the reports are at a river basin district level, almost all the monitoring programmes within them are organised at regional level.

**FACTS AND FIGURES**

Italy has a population of 59 million (Eurostat, 2007) and an area of 304,392 km<sup>2</sup>.

Italy shares two international river basins with neighbouring countries: Po Basin and Eastern Alps.



**River basin districts and number of water bodies**

River Basin District	Surface (km <sup>2</sup> )	% National territory	Number of river water bodies	Number of lake water bodies	Number of transitional water bodies	Number of coastal water bodies	Number of groundwater bodies
Po Basin	70700	23	117	53	4	2	145
Southern Appenines	68200	22	267	30	7	79	131
Eastern Alps	39385	13	195	22	10	21	62
Northern Appenines	39000	13	137	9	3	19	15
Middle Appenines	35800	12	452	29	5	33	19
Sicily	25707	8	38	34	12	38	73
Sardinia	24000	8	22	32	39	67	37
Serchio	1600	0.5	2	1	-	1	5
<b>Italy</b>	<b>304392</b>	<b>100</b>	<b>1230</b>	<b>210</b>	<b>80</b>	<b>260</b>	<b>487</b>

## Number of surveillance, operational and quantitative monitoring stations

River Basin District	Rivers		Lakes		Transitional waters		Coastal waters		Groundwaters		
	Surv	Op	Surv	Op	Surv	Op	Surv	Op	Surv	Op	Quant
Po Basin	203	415	26	74	0	7	0	5	97	1018	0
Southern Appenines	44	80	7	9	0	15	16	52	72	709	0
Eastern Alps	221	164	21	10	0	8	0	73	395	75	0
Northern Appenines	7	16	0	0	0	0	0	0	0	0	0
Middle Appenines	135	229	8	13	4	7	94	31	633	526	0
Sicily	0	0	0	0	0	0	0	0	0	0	0
Sardinia	10	92	18	66	23	113	193	24	28	47	0
Serchio	0	0	0	0	-	-	0	0	0	0	0
<b>Total</b>	<b>620</b>	<b>996</b>	<b>80</b>	<b>172</b>	<b>27</b>	<b>150</b>	<b>303</b>	<b>185</b>	<b>1225</b>	<b>2375</b>	<b>0</b>
<b>Total number of monitoring stations</b>											

**Note:**

1. The total number of monitoring stations was not provided. Total number of monitoring stations is not necessarily the sum of surveillance and operational as there are stations that serve both purposes.

2. The numbers presented in this table were only received on 3 March 2009 and therefore this information has not been taken into account in the assessment. The numbers differ substantially from the ones reported under article 8 by Italy in 2007, which are the ones used in the indicators and tables in the rest of this report. The numbers in the table above are much lower and have been provided as a response to a consultation in January 2009.

## Number of monitoring stations in protected areas reported under the WFD

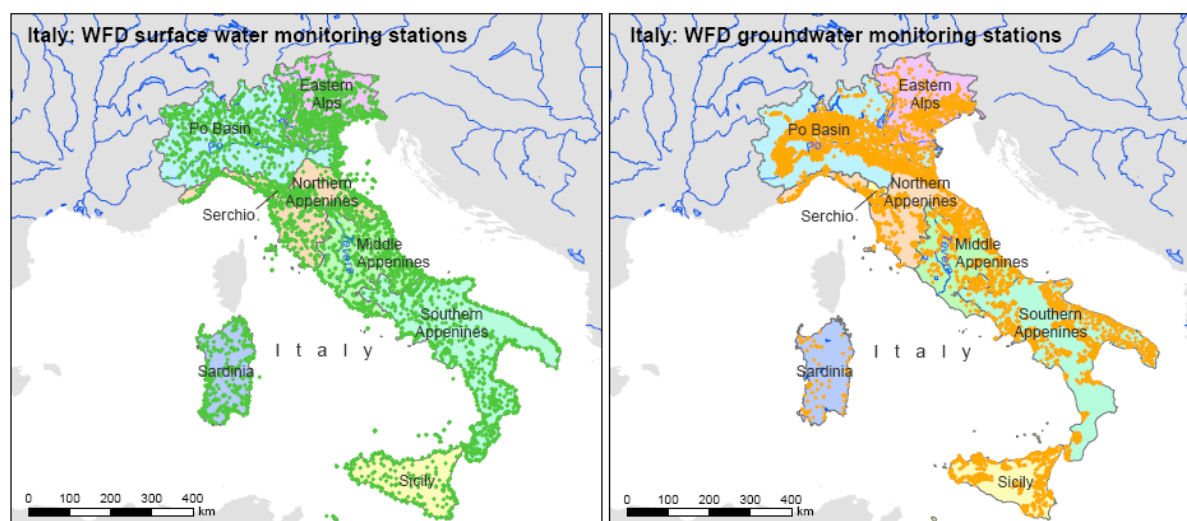
River Basin District	Surface water							Ground water
	Bathing Water	Habitats / Birds	Drinking Water	Fish	Shellfish	Nitrates	Urban waste water	Drinking water
Po Basin		355		152	34	326	170	22
Southern Appenines		373		173	55	122	24	3
Eastern Alps		425		444	85	239	336	135
Northern Appenines		289		241	138	52	218	273
Middle Appenines		287		242	64	69	71	31
Sicily		131		0	0	8	9	0
Sardinia		365		43	128	15	210	0
Serchio		9		29	0	2	0	1
<b>Total</b>		<b>2234</b>		<b>1324</b>	<b>504</b>	<b>833</b>	<b>1038</b>	<b>465</b>

**Note:**

1. The reporting of monitoring of protected areas under the Water Framework Directive was due only if the information was not reported under other directives. A total of 2599 surface water monitoring stations for nitrates have been reported by Italy under the nitrates Directive in 2008 (reference period 2004-2007). 5692 surface water monitoring stations were reported under the bathing water directive (bathing season 2007). Those figures are preliminary as quality checking is on-going at the time this report is written.

2. The numbers presented in this table were only received on 3 March 2009 and therefore this information has not been taken into account in the assessment. The numbers in the table have been provided as a response to a consultation in January 2009.

### Location of surface water and groundwater monitoring stations



**Note:** These maps have not been adjusted to the numbers provided by Italy on 3 March 2009 shown in the table above.

## SURFACE WATER MONITORING PROGRAMMES

### Design of Monitoring Programmes

The reports assign all monitoring programmes and monitoring stations to both *surveillance* and *operational monitoring* and do not provide description to distinguish the two programmes. The reports state that not all regions have provided relevant data. In the Serchio river basin district, the report states that there are no monitoring programmes set up for coastal waters.

The reports do not provide information on the design of the monitoring programmes: for example, whether monitoring has been designed to supplement a previous pressure and impact assessment; how surveillance programmes are designed to monitor long-term changes; or whether *operational monitoring* focuses on water bodies at risk.

The report provides no information on design criteria other than a reference to the Italian transposition of the WFD Annex V. In addition, almost no information is provided on the monitoring of biological and hydromorphological quality elements. The report appears to be based solely on pre-WFD networks.

For *investigative* monitoring, the reports provide a general statement of objectives without any detail of the programmes themselves.

In terms of design of the monitoring programmes for *drinking water protected areas*, the reports for some of the river basin districts cite an annex to Legislative Decree no. 152 of 2006 which implies that drinking water monitoring programme should exist, but this is not clear.

The report provides information on the monitoring stations that are located in protected areas established by four other directives: Birds Directive; Habitats Directive; Nitrates Directive; and Urban Waste Water Treatment Directive. No information is given on *international*

coordination in the design of monitoring networks for those river basin districts which cross boundaries.




The monitoring programmes are mostly reported at regional level and there is no indication that those are coordinated at river basin district level.

Development of Biological Assessment Methods

No information reported on development of biological assessment methods or levels of confidence.

**Summary of available biological assessment methods**

	Rivers				Lakes				Transitional Waters				Coastal Waters		
	Phytoplankton	Macrophytes and Phytobenthos	Benthic invertebrates	Fish	Phytoplankton	Macrophytes and Phytobenthos	Benthic invertebrates	Fish	Phytoplankton	Macroalgae and Angiosperms	Benthic invertebrates	Fish	Phytoplankton	Macroalgae and Angiosperms	Benthic invertebrates
Italy															

Method available  Under development or incomplete information  Not developed or no information  Not relevant -

**Note:** In the context of the WFD intercalibration exercise, Italy has intercalibrated the national assessment methods for macroinvertebrates in rivers (Alpine, Central and Mediterranean geographical areas) and macroalgae in Mediterranean coastal waters. In addition, Italy has intercalibrated a parameter indicative of taxonomic composition and abundance of phytoplankton in lakes (Alpine and Mediterranean reservoirs), a parameter indicative of biomass of phytoplankton in lakes (Mediterranean reservoirs only) and a parameter indicative of biomass of phytoplankton in coastal waters (see Commission Decision 2008/915/EC of 30 October 2008 establishing, pursuant to Directive 2000/60/EC of the European Parliament and of the Council, the values of the Member State monitoring system classifications as a result of the intercalibration exercise, available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:332:0020:0044:EN:PDF>).

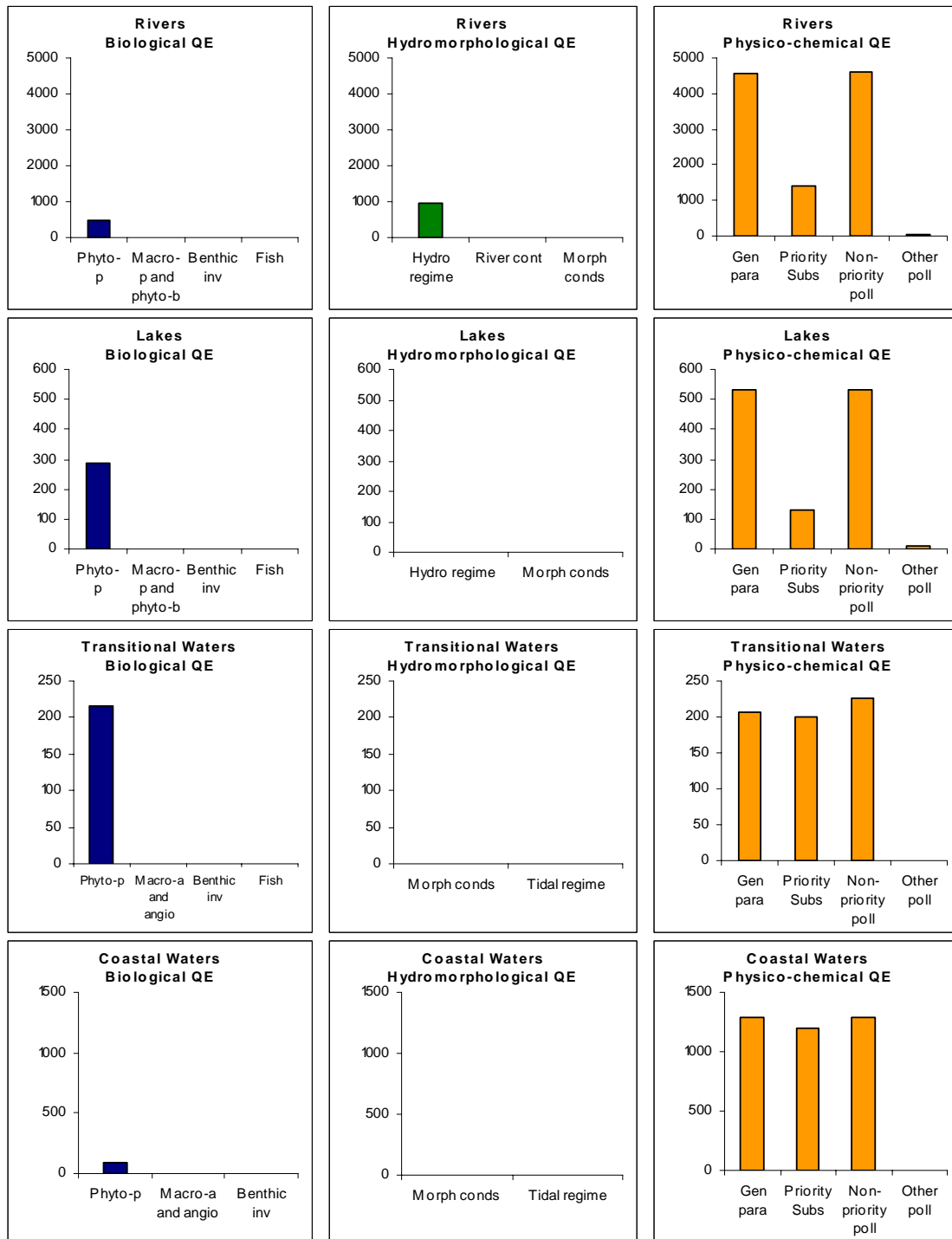
Selection of Quality Elements and Frequency of Monitoring

The reporting by Italy does not specify which biological quality elements are monitored in each water category, except for phytoplankton, which is specified in some rivers, lakes, coastal and transitional waters sub-programmes. Priority substances are not monitored in rivers in Sardegna and Sicily river basin districts, nor in transitional waters in Southern Apennines, where also other specific pollutants are not monitored. No information is given on the monitoring of hydromorphological parameters in lakes except in Eastern Alps river basin district. Hydromorphology is not monitored in transitional waters in Eastern Alps, and in coastal waters, only in Padano and Northern Apennines. In Sicily no general physico-chemical parameters are reported to be monitored in transitional waters.

Frequency of monitoring is generally reported once a year for all quality elements and monitoring programmes.

**Number of stations where quality elements are monitored (surveillance and operational monitoring) in rivers, lakes, transitional and coastal waters**

**Note:** The reporting by Italy does not specify which biological quality elements are monitored in each water category, except for phytoplankton



**GROUNDWATER**

Design of Monitoring Programmes

Information is missing on design of groundwater monitoring programmes.

According to the report, the Italian regions have not yet provided specific information on *operational* and *surveillance monitoring* programmes, and in the interim, the reports assign all monitoring stations to both surveillance and operational monitoring.

The report provides information on monitoring stations located in drinking water protected areas. Information on other international networks and networks under other EC legislation is not provided

#### Selection of Quality Elements and Frequency of Monitoring

The coverage of parameters varies across the various river basin districts.

In all river basin districts, monitoring stations cover chemical parameters. Many stations do not, however, cover Oxygen content or pH value. No information is provided on monitoring design with regard to pressures on groundwater.

Essentially all monitoring stations are monitored yearly.

#### **FURTHER INFORMATION**

*Further information has not been provided*

#### **SUMMARY OF TECHNICAL ASSESSMENT: STRENGTHS AND WEAKNESSES**

- + Monitoring network for surface waters and groundwater (chemical monitoring) with annual monitoring frequency
- It seems that there has not been a development of WFD monitoring programmes but instead the report includes existing pre-WFD networks
- The report give evidence of the lack of coordination between the regions (monitoring programmes are in many cases regionally based)
- Groundwater quantitative monitoring is missing
- Coastal monitoring is missing for the Serchio river basin district

## Member State: LATVIA

## INFORMATION SUPPLIED

Latvia has reported through WISE in the agreed format for its 4 river basin districts (Ventas, Lielupes, Gaujas and Daugavas). In addition a link to a national report “Vides monitoringa programma” has been provided.

## FACTS AND FIGURES

Latvia has a population of 2.3 million (Eurostat, 2007) and an area of 64,586 km<sup>2</sup>.

Latvia is situated in four international river basins: Daugava, Venta, Gauja and Lielupe.



## River basin districts and number of water bodies

River Basin District	Surface (km <sup>2</sup> )	% National territory	Number of river water bodies	Number of lake water bodies	Number of transitional water bodies	Number of coastal water bodies	Number of groundwater bodies
Daugava	27062	42	68	188	1	-	4
Venta	15625	24	68	30	-	6	8
Gauja	13050	20	47	36	1	1	4
Lielupe	8849	14	39	13	1	-	0
<b>Latvia</b>	<b>64586</b>	<b>100</b>	<b>222</b>	<b>267</b>	<b>3</b>	<b>7</b>	<b>16</b>

## Number of surveillance, operational and quantitative monitoring stations

River Basin District	Rivers		Lakes		Transitional waters		Coastal waters		Groundwaters		
	Surv	Op	Surv	Op	Surv	Op	Surv	Op	Surv	Op	Quant
Daugava	9	25	17	19	1	0	-	-	22	0	18
Venta	9	25	7	10	-	-	9	3	19	0	23
Gauja	10	17	3	11	6	2	5	1	22	0	11
Lielupe	5	21	3	4	3	0	-	-	14	0	9
<b>Total</b>	<b>33</b>	<b>88</b>	<b>30</b>	<b>44</b>	<b>10</b>	<b>2</b>	<b>14</b>	<b>4</b>	<b>77</b>	<b>0</b>	<b>61</b>
<b>Total number of monitoring stations</b>	<b>121</b>		<b>74</b>		<b>12</b>		<b>18</b>		<b>77</b>		

**Note:** A large number of additional monitoring stations were reported but marked as neither surveillance nor operational monitoring: 101 additional stations for rivers, 197 for lakes, 12 for transitional waters and 23 for coastal waters.

### Number of WFD monitoring stations in protected areas reported under the WFD

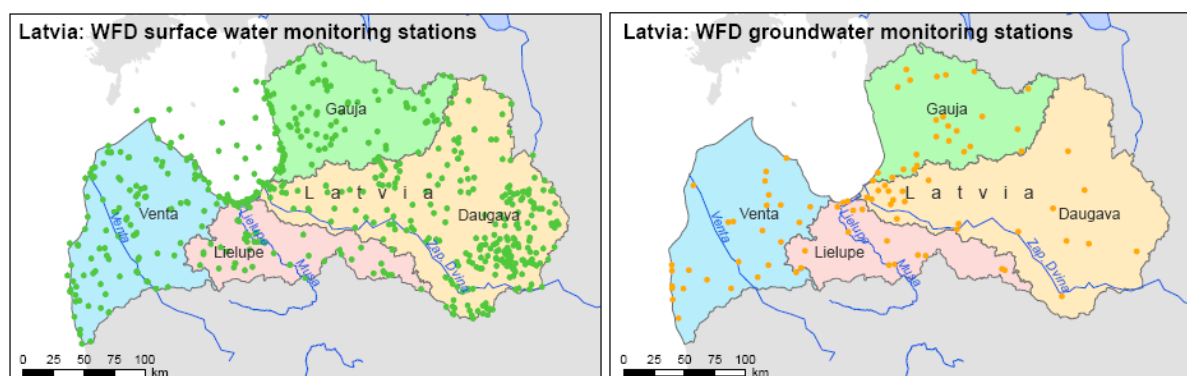
River Basin District	Surface water							Ground water
	Bathing Water	Habitats / Birds	Drinking Water	Fish	Shellfish	Nitrates	Urban waste water	Drinking Water
Daugava	1	118	2	52		7	-	
Venta	13	57		44			-	
Gauja	11	64		25		11	-	
Lielupe	10	22		13		37	-	
<b>Total</b>	<b>35</b>	<b>261</b>	<b>2</b>	<b>134</b>		<b>55</b>	<b>-</b>	

#### Notes:

1. The reporting of monitoring of protected areas under the Water Framework Directive was due only if the information was not reported under other directives. A total of 356 surface water monitoring stations for nitrates have been reported by Latvia under the nitrates Directive in 2008 (reference period 2004-2007). 278 surface water monitoring stations were reported under the bathing water directive (bathing season 2007). Those figures are preliminary as quality checking is on-going at the time this report is written.

2. Latvia applies more stringent waste water treatment in the whole of its territory and therefore, in accordance to article 5.8 of the Urban Waste Water Directive 1991/271/EEC, it is exempted from designation of specific sensitive areas.

### Location of surface water and groundwater monitoring stations



## SURFACE WATER MONITORING PROGRAMMES

### Design of Monitoring Programmes

There are standard national monitoring programmes for both *operational* and *surveillance monitoring* with subprogrammes for rivers, lakes, transitional and coastal waters. The design objectives of the programmes are not reported and are not obvious in the source reference. Although the monitoring programmes are probably aimed at assessing the long term changes arising from anthropogenic activity this is not explicitly stated, and only one reference monitoring site is reported. There is insufficient information on the methodology to upgrade the existing network and to assess if Water Framework Directive objectives and criteria were covered or taken into account by the monitoring programmes.

There is no clear separation of surveillance and operational programmes. Many stations are identified as belonging neither to surveillance nor to operational monitoring programmes. Although there might be reasons for stations being neither surveillance not operational (i.e.

reporting of networks for other purposes), those are not clear from the report. The information in the monitoring programmes file is not consistent with that in the stations file.

The report states that *investigative monitoring* is “performed to clarify reasons (if unknown) of endangering of environmental quality, of failures to reach ecological quality targets, and to assess the impact of pollution which has been arisen in an incident and to obtain necessary data for improving countermeasures”, but it does not provide any additional information. The monitoring programmes were already in place in 2006 and revised in 2007.

The report provides quite comprehensive information on the location of monitoring stations in *protected areas*.

Almost no information is given on international co-ordination. Some sites are reported to be part of WISE-SoE (formerly Eionet-Water) and/or Helcom reporting/monitoring.

### Development of Biological Assessment Methods

Information is provided neither on development of biological assessment methods nor on *confidence levels and precision*.

#### Summary of available biological assessment methods

	Rivers				Lakes				Transitional Waters				Coastal Waters		
	Phytoplankton	Macrophytes and Phytobenthos	Benthic invertebrates	Fish	Phytoplankton	Macrophytes and Phytobenthos	Benthic invertebrates	Fish	Phytoplankton	Macroalgae and Angiosperms	Benthic invertebrates	Fish	Phytoplankton	Macroalgae and Angiosperms	Benthic invertebrates
Daugava	■	■	■	■	■	■	■	■	■	■	■	■	---	---	---
Venta	■	■	■	■	■	■	■	■	---	---	---	---	■	■	■
Gauja	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Lielupe	■	■	■	■	■	■	■	■	■	■	■	■	---	---	---

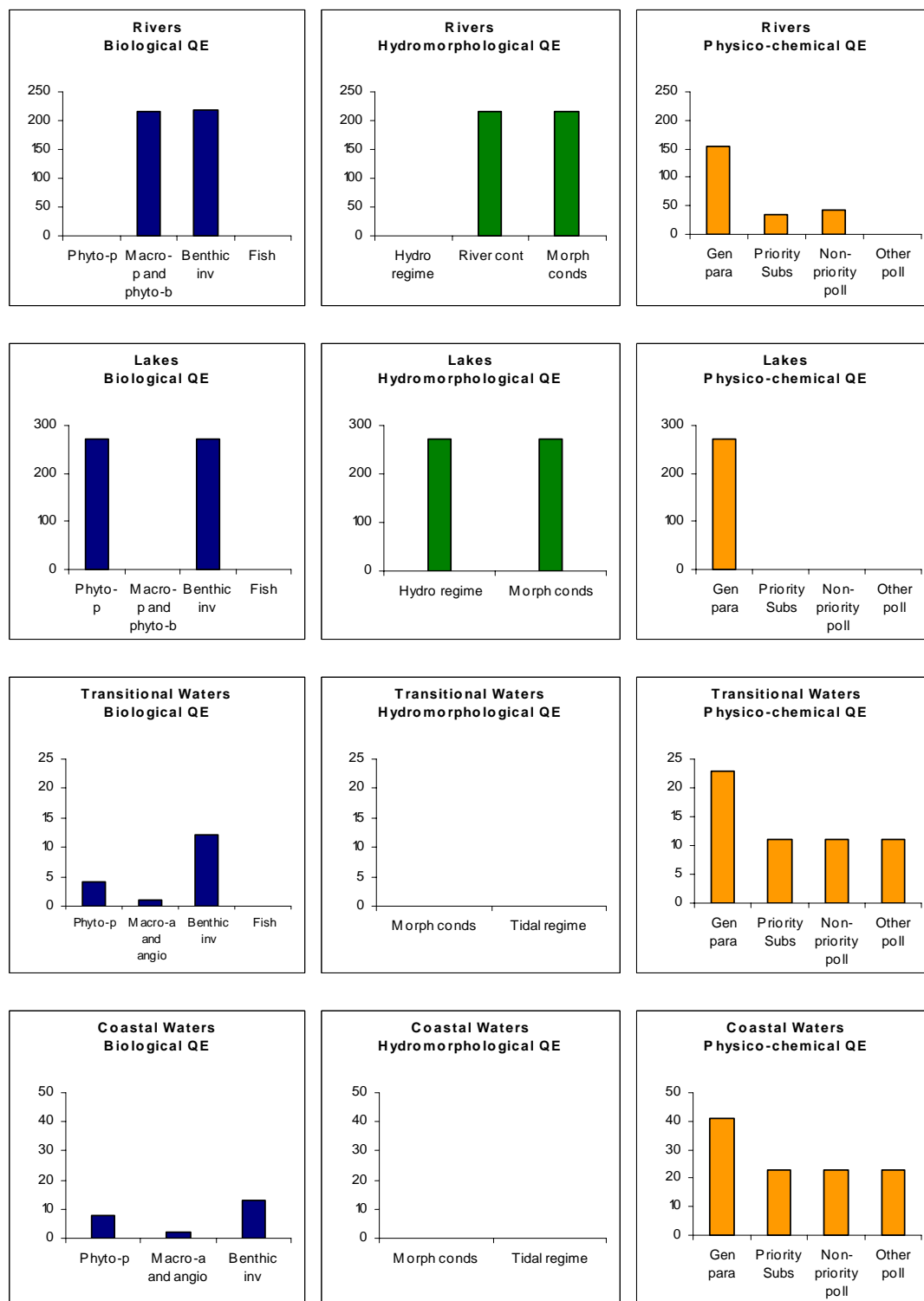
Method available ■ Under development or incomplete information ■ Not developed or no information ■ Not relevant -

**Note:** In the context of the WFD intercalibration exercise, Latvia has intercalibrated the national assessment method for macrophytes in lakes. In addition, Latvia has intercalibrated a parameter indicative of biomass of phytoplankton in lakes and in coastal waters (chlorophyll-a) (see Commission Decision 2008/915/EC of 30 October 2008 establishing, pursuant to Directive 2000/60/EC of the European Parliament and of the Council, the values of the Member State monitoring system classifications as a result of the intercalibration exercise, available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:332:0020:0044:EN:PDF>).

### Selection of Quality Elements and Frequency of Monitoring

The selection of quality elements is not at all comprehensive. Fish is not monitored in any water category. Phytoplankton is not monitored in rivers. Other aquatic flora apart from phytoplankton is not monitored in lakes. Priority substances are not monitored in lakes in Daugava river basin district. In transitional waters, macroinvertebrates is the only biological quality element monitored in Daugava and Lielupe river basin district, whereas in the Gauja fish is missing. Hydromorphology is not monitored in transitional and coastal waters.

**Number of stations where quality elements are monitored (surveillance and operational monitoring) in rivers, lakes, transitional and coastal waters**



All quality elements are reported to be monitored every year except composition and abundance of other aquatic flora which is monitored once every 3 years. Chemical and physico-chemical quality elements are measured 3-6 times a year.

## GROUNDWATER MONITORING PROGRAMMES

### Design of Monitoring Programmes

There are specific monitoring programmes for chemical *surveillance monitoring* in each of the river basin district. No *operational monitoring* programme is reported (no stations). For both programmes, the information is limited. There is no information on the methodologies for site selection except that there are existing wells. In the reference report there is no clear evidence that the results of 2004 analysis, or that long-term trends or that the criteria in WFD have been taken into account.

There is no information on additional monitoring in relation to *drinking water protected areas*.

In the reference document all of the listed Directives are reported to be listed as legal acts on which the monitoring program is developed. In the stations report the stations belonging to WISE-SoE are identified.

Although, all Latvian river basin districts are international, there is no reference to any international co-operation or any relevant comments.

### Selection of Quality Elements and Frequency of Monitoring

Chemical *surveillance monitoring* covers only core parameters.

According to the electronic reporting the groundwater level is monitored once a year, but the information in the reference report suggests that in 2006 monitoring is annual but from 2007 the frequency of the monitoring will be reduced to every 3 years. Chemical parameters are reported to be monitored once a year.

## FURTHER INFORMATION

<http://www.lvgma.gov.lv/vmp2005/>

## SUMMARY OF TECHNICAL ASSESSMENT: STRENGTHS AND WEAKNESSES

- + Frequency of monitoring of surface waters is higher than the minimum in the WFD
- The report is incomplete in many areas
- No clear concept in developing WFD monitoring programmes
- No information on methods to assess ecological status

## Member State: LITHUANIA

## INFORMATION SUPPLIED

Lithuania has reported through WISE in the agreed format surface and groundwater monitoring stations and monitoring programmes for its four river basin districts. Reference to the national monitoring programme on groundwater was mentioned but no web links or copy of the programmes was provided. There are transitional and coastal waters only in the Nemunas river basin district.

## FACTS AND FIGURES

Lithuania has a population of 3.4 million (Eurostat, 2007) and an area of 65,300 km<sup>2</sup>.

Lithuania is situated in four international river basins: Nemunas, Lielupe, Venta and Daugava.



## River basin districts and number of water bodies

River Basin District	Surface (km <sup>2</sup> )	% National territory	Number of river water bodies	Number of lake water bodies	Number of transitional water bodies	Number of coastal water bodies	Number of groundwater bodies
Nemunas	48203	74	620	288	4	2	17
Lielupe	8949	14	136	22	-	-	3
Venta	6278	10	104	22	-	-	2
Daugava	1870	3	17	28	-	-	0
<b>Lithuania</b>	<b>65300</b>	<b>100</b>	<b>877</b>	<b>360</b>	<b>4</b>	<b>2</b>	<b>22</b>

## Numbers of surveillance, operational and quantitative monitoring stations

River Basin District	Rivers		Lakes		Transitional waters		Coastal waters		Groundwaters		
	Surv	Op	Surv	Op	Surv	Op	Surv	Op	Surv	Op	Quant
Nemunas	445	382	162	98	0	18	0	17	174	0	54
Lielupe	77	76	7	11	-	-	-	-	25	0	8
Venta	62	68	5	14	-	-	-	-	28	0	9
Daugava	20	6	25	3	-	-	-	-	10	0	3
<b>Total</b>	<b>604</b>	<b>532</b>	<b>199</b>	<b>126</b>	<b>0</b>	<b>18</b>	<b>0</b>	<b>17</b>	<b>237</b>	<b>0</b>	<b>74</b>
<b>Total number of monitoring stations</b>	<b>1136</b>		<b>325</b>		<b>18</b>		<b>17</b>		<b>237</b>		

**Note:** A number of additional monitoring stations were reported but marked as neither surveillance nor operational monitoring: 106 additional stations for rivers and 21 for lakes.

## Number of monitoring stations in protected areas reported under the WFD

River Basin District	Surface water							Ground water
	Bathing Water	Habitats / Birds	Drinking Water	Fish	Shellfish	Nitrates	Urban waste water	Drinking water
Nemunas						-	-	76
Lielupe					-	-	-	12
Venta					-	-	-	14
Daugava					-	-	-	3
<b>Total</b>						-	-	<b>105</b>

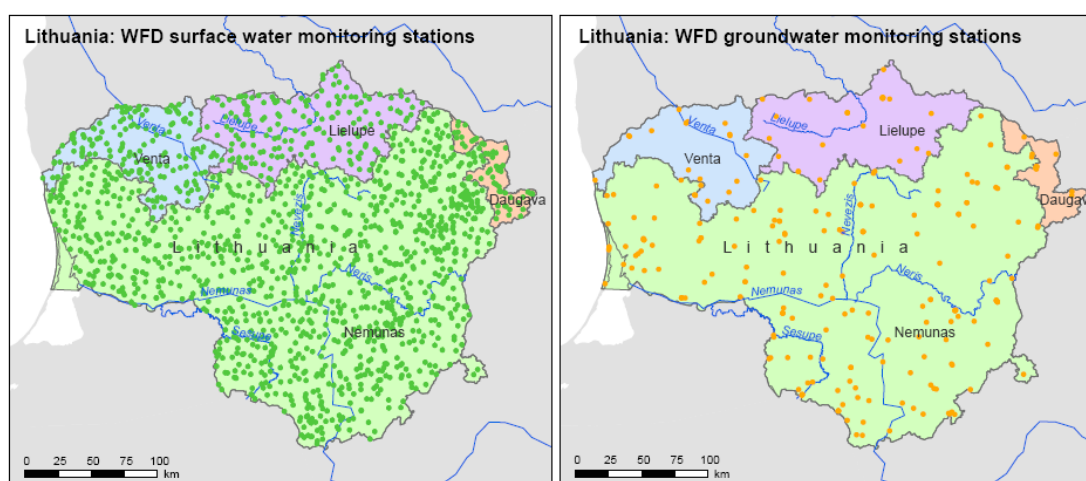
**Notes:**

1. The reporting of monitoring of protected areas under the Water Framework Directive was due only if the information was not reported under other directives. A total of 127 surface water monitoring stations for nitrates have been reported by Lithuania under the nitrates Directive in 2008 (reference period 2004-2007). 100 surface water monitoring stations were reported under the bathing water directive (bathing season 2007). Those figures are preliminary as quality checking is on-going at the time this report is written.

2. Lithuania has established and applies action programmes in the whole of its territory and therefore, in accordance to article 3.5 of the Nitrates Directive 1991/676/EEC, it is exempted from designation of specific vulnerable zones.

3. Lithuania applies more stringent waste water treatment in the whole of its territory and therefore, in accordance to article 5.8 of the Urban Waste Water Directive 1991/271/EEC, it is exempted from designation of specific sensitive areas.

## Location of surface water and groundwater monitoring stations



## SURFACE WATER MONITORING PROGRAMMES

Design of Monitoring Programmes

WFD objectives in terms of validating the results of the 2004 Article 5 risk assessment and for detecting long term changes in natural conditions are reported to have been taken into account in the design of *surveillance monitoring* for rivers and lakes. No surveillance monitoring is reported for transitional and coastal waters in the Nemunas river basin district. In addition, no monitoring stations in transitional or coastal waters have been reported in the stations file (only the monitoring programmes are reported).

*Operational monitoring* has been designed to assess the status of water bodies at risk in rivers and lakes. The information is not clear for transitional and coastal waters.

A strategy for *investigative monitoring* has been established.

The report does not provide any information on the *monitoring of protected areas* although it mentions that some sites are located in the protected areas. No specific sub-programmes have been established in relation to drinking water protected areas.




Reference is made to linkages with the HELCOM Baltic Sea monitoring programme, but there was no other evidence of *international coordination* in designing the monitoring networks.

### Development of Biological Assessment Methods

There is incomplete information on development of biological assessment methods and no information given on *levels of confidence and precision*. Macroinvertebrates in rivers are said to be assessed with the Danish method.

#### Summary of available biological assessment methods

	Rivers				Lakes				Transitional Waters				Coastal Waters		
	Phytoplankton	Macrophytes and Phytobenthos	Benthic invertebrates	Fish	Phytoplankton	Macrophytes and Phytobenthos	Benthic invertebrates	Fish	Phytoplankton	Macroalgae and Angiosperms	Benthic invertebrates	Fish	Phytoplankton	Macroalgae and Angiosperms	Benthic invertebrates
Lithuania															

Method available  Under development or incomplete information  Not developed or no information  Not relevant -

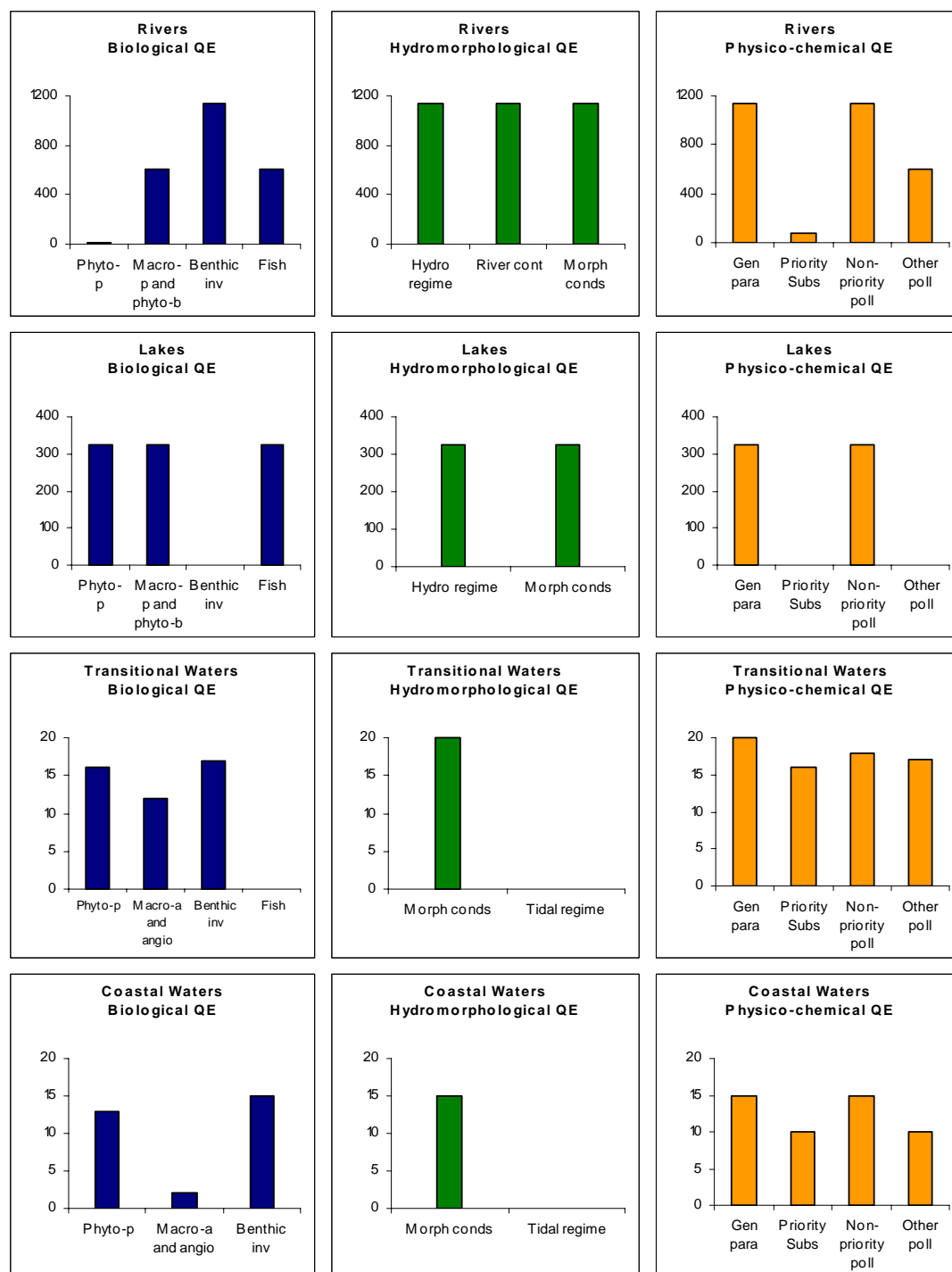
**Note:** In the context of the WFD intercalibration exercise, Lithuania has only intercalibrated parameters indicative of biomass of phytoplankton in lakes and in one type of transitional waters (see Commission Decision 2008/915/EC of 30 October 2008 establishing, pursuant to Directive 2000/60/EC of the European Parliament and of the Council, the values of the Member State monitoring system classifications as a result of the intercalibration exercise, available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:332:0020:0044:EN:PDF>).

### Selection of Quality Elements and Frequency of Monitoring

Surveillance monitoring for rivers covers all quality elements. In lakes neither macroinvertebrates nor priority substances are monitored. There is no surveillance monitoring for transitional and coastal waters.

Biological *operational monitoring* in rivers focuses on one quality element, composition, abundance and diversity of benthic invertebrate fauna. In lakes, operational monitoring is based on phytoplankton, macrophytes and fish. Biological quality elements are monitored in transitional waters excluding fish and in coastal waters all three elements and zooplankton.

**Number of stations where quality elements are monitored (surveillance and operational monitoring) in rivers, lakes, transitional and coastal waters**



*The frequency of monitoring varies between the different sub-programmes, quality elements and water bodies. For rivers and lakes monitoring of biological quality elements will be carried out every 3 or 6 years except for macroinvertebrates, every year. For transitional and coastal waters the monitoring of biological quality elements is carried out every year.*

## GROUND WATER MONITORING PROGRAMMES

### Design of monitoring programme

The Article 8 reports for groundwater monitoring are incomplete and do not provide sufficient and clear information for most of the sections required.

In each of the river basin districts, there are specific monitoring programmes for chemical *surveillance monitoring* and for groundwater level monitoring. No *operational monitoring* programme was reported.

For both surveillance and quantitative programmes, the information in the report is limited and insufficient. The description of the methodologies does not provide sufficient information to understand how the sites were selected and if the results of 2004 pressure and impact analysis have been taken into account. Although the report indicates that WFD requirements are fulfilled, it does not provide supportive evidence that the criteria for surveillance monitoring have been taken into account.

Although the monitoring programme indicates that drinking water abstraction sites, with less than 100 m<sup>3</sup>/d, are included in the *surveillance monitoring* network, there is no further information on additional monitoring in relation to *drinking water abstraction*.

Information on *protected areas* is limited to comments that monitoring requirements under the Nitrates and Groundwater Directives are covered by the surveillance programme. For drinking water areas with more than 100 m<sup>3</sup>/d and sites of Integrated Pollution Prevention and Control Directive specific monitoring programmes are in place. Although, each river basin district is international, there is no reference to *international co-operation*, only a brief comment that for transboundary groundwater bodies, monitoring stations are provided in the river basin district in which they physically occur. The report on monitoring stations indicates which stations are part of the WISE-SoE.

### Selection of Quality Elements and Frequency of Monitoring

Chemical *surveillance monitoring* covers all general parameters (oxygen content, pH value, conductivity, nitrate and ammonium) and other pollutants (not specific parameters).

*Frequency of monitoring*: Groundwater level is monitored daily every year (cycle one, frequency 365). All general and other chemical parameters are measured once a year every year.

## FURTHER INFORMATION

No further information was provided.

## SUMMARY OF TECHNICAL ASSESSMENT: STRENGTHS AND WEAKNESSES

- + High density of monitoring stations in rivers and lakes
- Report very brief, no information about design criteria
- Availability of methods to assess ecological status

## Member State: LUXEMBOURG

## INFORMATION SUPPLIED

Luxembourg supplied reports through WISE in the agreed format for its two river basin districts.

## FACTS AND FIGURES

Luxembourg has a population of 0.5 million (Eurostat, 2007) and an area of 2,586 km<sup>2</sup>.

Luxembourg is situated in two international river basins: Rhine and Meuse.

Luxembourg has no lakes, transitional or coastal waters.



## River basin districts and number of water bodies

River Basin District	Surface (km <sup>2</sup> )	% national territory	Number of river water bodies	Number of lake water bodies	Number of transitional water bodies	Number of coastal water bodies	Number of groundwater bodies
Rhine	2521	97	98	-	-	-	2
Meuse	65	3	3	-	-	-	1
<b>Luxembourg</b>	<b>2586</b>	<b>100</b>	<b>101</b>	-	-	-	<b>3</b>

## Numbers of surveillance, operational and quantitative monitoring stations

River Basin District	Rivers		Lakes		Transitional waters		Coastal waters		Groundwaters		
	Surv	Op	Surv	Op	Surv	Op	Surv	Op	Surv	Op	Quant
Rhine	4	16	-	-	-	-	-	-	31	0	11
Meuse	1	1	-	-	-	-	-	-	0	0	0
<b>Total</b>	<b>5</b>	<b>17</b>	-	-	-	-	-	-	<b>31</b>	<b>0</b>	<b>11</b>
<b>Total number of monitoring stations</b>	<b>17</b>		-		-		-		<b>31</b>		<b>11</b>

**Note:** Total number of monitoring stations is not necessarily the sum of surveillance and operational as there are stations that serve both purposes

## Number of monitoring stations in protected areas reported under the WFD

River Basin District	Surface water							Ground water
	Bathing Water	Habitats / Birds	Drinking Water	Fish	Shellfish	Nitrates	Urban waste water	Drinking Water
Rhine		4	1	12	-	-	-	17
Meuse					-	-	-	
<b>Total</b>		<b>4</b>	<b>1</b>	<b>12</b>	-	-	-	<b>17</b>

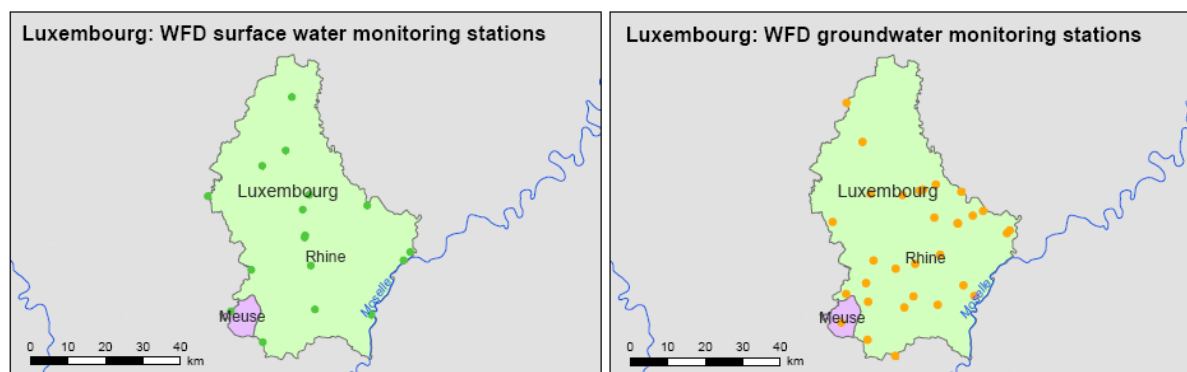
## Notes:

1. The reporting of monitoring of protected areas under the Water Framework Directive was due only if the information was not reported under other directives. A total of 16 surface water monitoring stations for nitrates have been reported by Luxembourg under the nitrates Directive in 2008 (reference period 2004-2007). 20 surface water monitoring stations were reported under the bathing water directive (bathing season 2007). Those figures are preliminary as quality checking is on-going at the time this report is written.

2. Luxembourg has established and applies action programmes in the whole of its territory and therefore, in accordance to article 3.5 of the Nitrates Directive 1991/676/EEC, it is exempted from designation of specific vulnerable zones.

3. Luxembourg applies more stringent waste water treatment in the whole of its territory and therefore, in accordance to article 5.8 of the Urban Waste Water Directive 1991/271/EEC, it is exempted from designation of specific sensitive areas.

### Location of surface water and groundwater monitoring stations



## SURFACE WATER MONITORING PROGRAMMES

### Design of Monitoring Programmes

Sub-programmes for *surveillance* and, in the case of the Rhine river basin district, *operational monitoring* have been established. There is no information on strategic objectives, neither for surveillance monitoring, nor for operational monitoring. The only criteria mentioned, are that the selected sites should be representative of the entire river basin and that quality elements should be monitored within the same water body but not necessarily at the same monitoring station.

*Investigative Monitoring*: the reports merely indicate that ‘immediate investigations and analyses will be carried out in order to remedy problems’. Information on types of incidents (other) is marked as ‘not applicable’.

There is no reported information as to whether additional monitoring is undertaken in relation to *drinking water protected areas*. The reports identify monitoring stations located in protected areas, but there is no information on the design of the monitoring programmes under the various drivers, nor of the methodology or criteria used to select sites

There is one operational monitoring site (Rhine) with conflicting information about whether there is any drinking water abstraction from the site or associated water bodies, all others are indicated as not part of a *protected area* under the *Drinking Water Directive*.

The report does not mention any *international coordination* for the surface water monitoring programmes.

### Development of Biological Assessment Methods

A brief description of the methods for the biological quality elements for rivers is included in the report, but no clear reference to developed assessment methods. Therefore, the methods have been considered under development. There is no information on frequency or levels of *confidence and precision*.

Summary of available biological assessment methods

	Rivers				Lakes				Transitional Waters				Coastal Waters		
	Phytoplankton	Macrophytes and Phytobenthos	Benthic invertebrates	Fish	Phytoplankton	Macrophytes and Phytobenthos	Benthic invertebrates	Fish	Phytoplankton	Macroalgae and Angiosperms	Benthic invertebrates	Fish	Phytoplankton	Macroalgae and Angiosperms	Benthic invertebrates
Luxembourg	■	■	■	■	-	-	-	-	-	-	-	-	-	-	-

Method available ■ Under development or incomplete information ■ Not developed or no information ■ Not relevant -

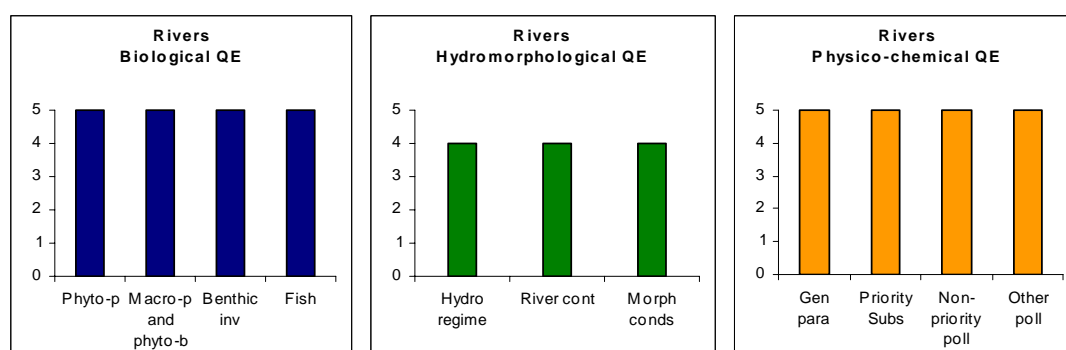
**Note:** In the context of the WFD intercalibration exercise, Luxembourg has intercalibrated the national assessment methods for macroinvertebrates and phytobenthos in rivers (see Commission Decision 2008/915/EC of 30 October 2008 establishing, pursuant to Directive 2000/60/EC of the European Parliament and of the Council, the values of the Member State monitoring system classifications as a result of the intercalibration exercise, available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:332:0020:0044:EN:PDF>).

Selection of Quality Elements and Frequency of Monitoring

Surveillance monitoring covers all quality elements. For operational monitoring (in the Rhine only), the biological quality elements are not specified.

The monitoring cycle is every year or every 3 years depending on the quality element and river basin district. The frequency of operational monitoring is still to be decided.

Number of stations where quality elements are monitored (surveillance and operational monitoring) in rivers, lakes, transitional and coastal waters



GROUNDWATER MONITORING PROGRAMMES

Design of Monitoring Programmes

Whilst there is no groundwater monitoring in the Luxembourg part of the Meuse river basin district, there is a monitoring programme in the Rhine river basin district. This includes *surveillance*, *chemical* and *quantitative monitoring*, but no *operational monitoring* in this part of the Rhine river basin district.

A very brief description indicates that sites were selected on the basis of pressures, such as land use and geomorphological conditions, to get a general overview of chemical status and trends. However, it is not clear how the 2004 pressure and impact analysis is taken into account.

Although the monitoring programme includes drinking water abstraction sites, additional monitoring in relation to drinking water abstraction is yet to be established.

There is a brief reference to *international co-operation* in the Rhine RBD (Saar-Moselle Convention – ICPSM).

### Selection of Quality Elements and Frequency of Monitoring

*Surveillance monitoring* (no operational monitoring) in the Rhine river basin district includes the all the core parameters except oxygen content. Other specific pollutants are not included. Additional monitoring at drinking water abstraction sites is still to be established.

Groundwater level is monitored once a year (cycle one, frequency one) at about one third of total sites. Chemical parameters are also measured once a year.

### **FURTHER INFORMATION**

*No further information was submitted*

### **SUMMARY OF TECHNICAL ASSESSMENT: STRENGTHS AND WEAKNESSES**

- + Frequency of surveillance monitoring is higher than the minimum required in the WFD
- Report very brief, no information about design criteria
- Status of development of methods for the assessment of ecological status not clear

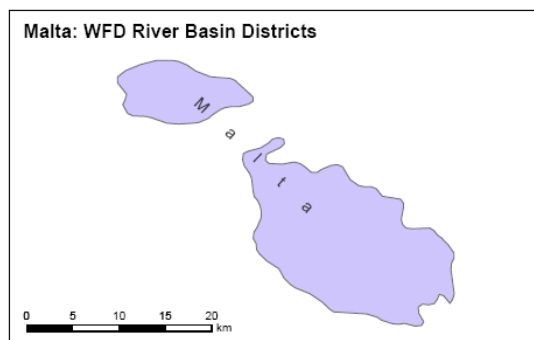
**Member State: MALTA****INFORMATION SUPPLIED**

Malta sent a report only on monitoring of groundwater. There is no information provided on surface waters. Malta did not submit the report in electronic format through WISE, but a electronic version of a paper report was provided together with a link to additional information.

**FACTS AND FIGURES**

Malta has a population of 400,000 and an area of 399 km<sup>2</sup> (including coastal waters).

Malta comprises one river basin district.

**River basin districts and number of water bodies**

River Basin District	Surface (km <sup>2</sup> )	% National territory	Number of river water bodies	Number of lake water bodies	Number of transitional water bodies	Number of coastal water bodies	Number of groundwater bodies
Malta	399	100	4	4	3	19	16
<b>Malta</b>	<b>399</b>	<b>100</b>	<b>4</b>	<b>4</b>	<b>3</b>	<b>19</b>	<b>16</b>

**Number of surveillance, operational and quantitative monitoring stations**

River Basin District	Rivers		Lakes		Transitional waters		Coastal waters		Groundwaters		
	Surv	Op	Surv	Op	Surv	Op	Surv	Op	Surv	Op	Quant
Malta									38	38	40
<b>Total</b>									<b>38</b>	<b>38</b>	<b>40</b>
<b>Total number of monitoring stations</b>									<b>38</b>		<b>40</b>

**Notes:**

1. No information on surface water monitoring has been submitted.
2. Total number of monitoring stations is not necessarily the sum of surveillance and operational as there are stations that serve both purposes
3. There are 102 groundwater monitoring sites that are neither marked as quantitative, surveillance nor operational, included the stations covering protected areas.

### Number of monitoring stations in protected areas reported under the WFD

River Basin District	Surface water							Ground water
	Bathing Water	Habitats / Birds	Drinking Water	Fish	Shellfish	Nitrates	Urban waste water	Drinking Water
Malta						-		89
<b>Total</b>						-		<b>89</b>

#### Notes:

1. No information on surface water monitoring has been submitted.
2. The reporting of monitoring of protected areas under the Water Framework Directive was due only if the information was not reported under other directives. A total of 36 surface water monitoring stations for nitrates have been reported by Malta under the nitrates Directive in 2008 (reference period 2004-2007). 87 surface water monitoring stations were reported under the bathing water directive (bathing season 2007). Those figures are preliminary as quality checking is on-going at the time this report is written.
3. Malta has established and applies action programmes in the whole of its territory and therefore, in accordance to article 3.5 of the Nitrates Directive 1991/676/EEC, it is exempted from designation of specific vulnerable zones.

#### Location of surface water and groundwater monitoring stations

No information on surface water monitoring has been submitted. Co-ordinates for groundwater monitoring stations have been submitted but in an unknown projection, therefore can not be displayed.

#### SURFACE WATER MONITORING PROGRAMMES

There was no report on surface waters provided by Malta.

#### GROUNDWATER MONITORING PROGRAMMES

##### Design of Monitoring Programmes

Malta has put in place quantitative and surveillance monitoring programmes for groundwater. Surveillance monitoring stations may also be used as operational monitoring sites.

Although the *quantitative monitoring* programme is reported to assist the characterisation process, there was no clear evidence that the validation of the 2004 analysis had been taken into account in the design of such a programme. The selection of sites is based on conceptual models. Groundwater levels in boreholes will be used as the basic parameter for measuring quantitative status. In addition, in the perched aquifers, flow from springs will be used conjunctively with water level. The existing network which only covers 2 groundwater bodies will be complemented with additional sites in the other groundwater bodies.

*Surveillance monitoring* programme is reported to have taken into account the validation of 2004 analysis and long-term trends assessment. The criteria of the design of monitoring of the WFD have been taken into account for the selection of sites (in terms of groundwater bodies at risk). The selection of the monitoring sites was based on conceptual models. A wide range of parameters is reported to be monitored once every 6 years with an increased frequency being proposed for a number of additional indicators of anthropogenic contamination typical

of the land-use activity in the area and with the potential to impact groundwater status. These parameters would be part of the operational monitoring programme.

In addition, for groundwater bodies at risk included in the surveillance network, these are covered by an *operational monitoring* programme. Operational monitoring is carried out during the periods between surveillance monitoring, and focuses on groundwater bodies at risk.

There is an existing specific monitoring programme covering *drinking water protected areas* which will be adapted to reflect WFD objectives. All boreholes and pumping stations abstracting water intended for human consumption are monitored monthly under that programme. As regards protected areas, the report provides information on monitoring of *drinking water protected areas*.

Stations part of the WISE-SoE are identified.

### Selection of Quality Elements and Frequency of Monitoring

Core plus other *quality elements* (long list including microbiological, organic and inorganic parameters and metals) are reported to be selected on basis of potential risk to groundwater under the surveillance monitoring.

Under operational monitoring, core plus specific determinands selected on basis of pressures and including sodium, lead, zinc, copper, boron, chloride, fluoride and selected pesticides will be monitored in groundwater bodies at risk. In addition, any other parameters whereby any risks are identified from studies carried out during the planning cycle could be added to that list.

At existing sites in the 2 groundwater bodies, water level is continuously monitored while monthly measurement of water level will be introduced in the other water bodies, although initially these measurements will be done on a quarterly level. These monitoring points will be complemented, where possible, with flow measurements from springs. Flow measurements will initially be performed on a monthly basis; with automated systems measuring flow on a daily basis being gradually introduced with the aim of automating the whole network in the medium term.

Surveillance monitoring programme will be carried out once during each planning cycle (that is once every six years); with an increased *frequency* being proposed for a number of additional indicators of anthropogenic contamination typical of the land-use activity in the area and with the potential to impact groundwater status. For management purposes, these parameters will be incorporated with the operational monitoring programme.

For operational monitoring, monitoring frequency is being proposed to be twice every year, in spring and autumn. However, if the initial results coming out from these monitoring programmes identify significant threats from pollution in certain bodies of groundwater, a review of the monitoring strategy in these bodies will be carried out; and the possibility of extending the frequency of the operational monitoring to a quarterly basis will be considered.

**FURTHER INFORMATION**

[http://www.mra.org.mt/wfd\\_introduction.shtml](http://www.mra.org.mt/wfd_introduction.shtml)

**SUMMARY OF TECHNICAL ASSESSMENT: STRENGTHS AND WEAKNESSES**

- + Clear concept for the design of the groundwater monitoring programmes
- + High density of groundwater monitoring stations
- Report for surface waters missing
- No electronic reporting through WISE

**Member State: THE NETHERLANDS****INFORMATION SUPPLIED**

The Netherlands have reported through WISE in the agreed format for its four river basin districts. In addition, detailed reports on the national and international monitoring programmes were supplied:

- Samenvatting Nederlandse Monitoringprogramma's voor de deelstroomgebieden Rijndelta, Maas, Schelde en Eems
- Rapport inzake de Monitoringprogramma's volgens Kaderrichtlijn Water in het Stroomgebiedsdistrict Eems
- Rapportage inzake de coördinatie van de toestand- en trendmonitoringsprogramma's conform artikel 8 en artikel 15, lid 2 KRW in het internationale stroomgebiedsdistrict Rijn (Rijn-district) (deel A – rapportage)
- Internationaal stroomgebiedsdistrict Maas: Rapport over de coördinatie van de toestand- en trendmonitoringsprogramma's in het internationaal stroomgebiedsdistrict Maas

**FACTS AND FIGURES**

The Netherlands has a population of 16.4 million (Eurostat, 2007) and an area of ca. 41,800 km<sup>2</sup>. The Netherlands are situated in four international river basins: Rhine, Meuse, Scheldt and Ems.

**River basin districts and number of water bodies**

River Basin District	Surface (km <sup>2</sup> )	% National territory	Number of river water bodies	Number of lake water bodies	Number of transitional water bodies	Number of coastal water bodies	Number of groundwater bodies
Rhine	28500	68	142	340	2	6	11
Meuse	7500	18	103	49	1	2	5
Scheldt	3200	8	1	49	1	5	5
Ems	2600	6	5	14	1	2	2
<b>Netherlands</b>	<b>41800</b>	<b>100</b>	<b>251</b>	<b>452</b>	<b>5</b>	<b>15</b>	<b>23</b>

**Note:** Many artificial canals and ditches are included as lake water bodies due to their similar ecological character.

## Numbers of surveillance, operational and quantitative monitoring stations

River Basin District	Rivers		Lakes		Transitional waters		Coastal waters		Groundwaters		
	Surv	Op	Surv	Op	Surv	Op	Surv	Op	Surv	Op	Quant
Rhine	27	109	46	156	5	8	12	8	566	193	753
Meuse	43	108	13	31	4	5	4	2	384	178	186
Scheldt	2	3	6	24	4	3	7	5	38	3	32
Ems	2	5	5	15	5	2	3	1	60	20	33
<b>Total</b>	<b>74</b>	<b>225</b>	<b>70</b>	<b>226</b>	<b>18</b>	<b>18</b>	<b>26</b>	<b>16</b>	<b>1048</b>	<b>394</b>	<b>1004</b>
<b>Total number of monitoring stations</b>	<b>235</b>		<b>238</b>		<b>22</b>		<b>28</b>		<b>1099</b>		<b>1004</b>

**Note:** Total number of monitoring stations is not necessarily the sum of surveillance and operational as there are stations that serve both purposes

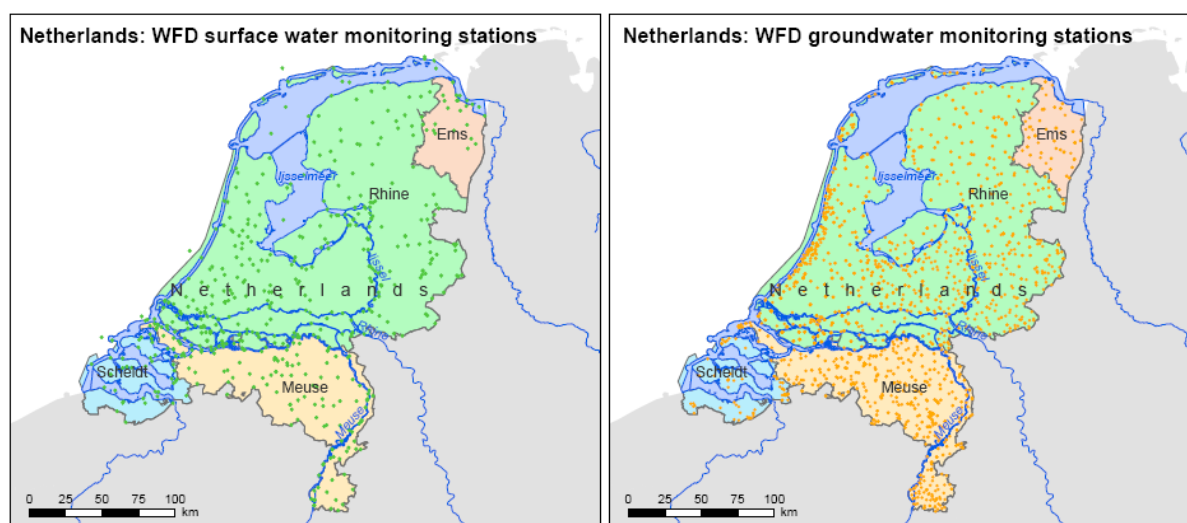
## Number of monitoring stations in protected areas reported under the WFD

River Basin District	Surface water							Ground water
	Bathing Water	Habitats / Birds	Drinking Water	Fish	Shellfish	Nitrates	Urban waste water	Drinking Water
Rhine			2			-	-	147
Meuse			4			-	-	62
Scheldt						-	-	5
Ems			1			-	-	8
<b>Total</b>			<b>7</b>			<b>-</b>	<b>-</b>	<b>222</b>

**Notes:**

1. The reporting of monitoring of protected areas under the Water Framework Directive was due only if the information was not reported under other directives. A total of 546 surface water monitoring stations for nitrates have been reported by the Netherlands under the nitrates Directive in 2008 (reference period 2004-2007). 643 surface water monitoring stations were reported under the bathing water directive (bathing season 2007). Those figures are preliminary as quality checking is on-going at the time this report is written.
2. The Netherlands has established and applies action programmes in the whole of its territory and therefore, in accordance to article 3.5 of the Nitrates Directive 1991/676/EEC, it is exempted from designation of specific vulnerable zones.
3. The Netherlands applies more stringent waste water treatment in the whole of its territory and therefore, in accordance to article 5.8 of the Urban Waste Water Directive 1991/271/EEC, it is exempted from designation of specific sensitive areas.
4. Under reporting directive 91/692/EC the Netherlands has reported 22 monitoring stations for the fish directive and 14 for the shellfish directive.
5. According to the information provided by the Dutch authorities, monitoring in habitats and birds protected areas will be part of a specific monitoring chapter in the management plan under preparation as a resulting obligation of these directives.

### Location of surface water and groundwater monitoring stations



## SURFACE WATER MONITORING PROGRAMMES

### Design of Monitoring Programmes

In general the reports provide clear and comprehensive information about the monitoring programmes. The approach to reporting on monitoring is very similar in all four river basin districts. There are no differences in terms of information on design of the networks between the different river basin districts. In each river basin district, separate programmes for surveillance and operational monitoring have been established. These are further sub-divided into sub-programmes to cover each water category and the four groups of quality elements (biological, chemical, physicochemical and hydromorphological).

The objectives for monitoring have been clearly mentioned except the validation of the 2004 analysis, which is not mentioned.

Monitoring points for *surveillance monitoring* are selected based on the criteria for surveillance monitoring listed in the Directive.

Monitoring points for *operational monitoring* were selected to establish the status of those bodies identified as being at risk.

*Investigative monitoring* will take place if the cause(s) for a water body to fail its objective or potential can not be ascertained after operational monitoring.

None of the reports provided information on *protected areas*. The reports stated that there is no additional specific monitoring effort for the purpose of drinking water protected areas.

*International coordination* of monitoring programmes has been put into place in each of the four international river basin districts and the reports refer to the relevant documents. The co-ordination of the programmes is carried out in the context of the International Commissions for the Protection of the Rhine, Meuse and Scheldt Rivers.

Development of Biological Assessment Methods

The methods for biological assessment are described, referenced and reported to be available for all biological quality elements. There is no information on the *levels of confidence and precision* in any of the reports.

**Summary of available biological assessment methods**

	Rivers				Lakes				Transitional Waters				Coastal Waters		
	Phytoplankton	Macrophytes and Phytobenthos	Benthic invertebrates	Fish	Phytoplankton	Macrophytes and Phytobenthos	Benthic invertebrates	Fish	Phytoplankton	Macroalgae and Angiosperms	Benthic invertebrates	Fish	Phytoplankton	Macroalgae and Angiosperms	Benthic invertebrates
Netherlands	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

Method available ■ Under development or incomplete information ■ Not developed or no information ■ Not relevant -

**Note:** In the context of the WFD intercalibration exercise, the Netherlands has intercalibrated national methods for a range of biological quality elements (see Commission Decision 2008/915/EC of 30 October 2008 establishing, pursuant to Directive 2000/60/EC of the European Parliament and of the Council, the values of the Member State monitoring system classifications as a result of the intercalibration exercise, available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:332:0020:0044:EN:PDF>).

Selection of Quality Elements and Frequency of Monitoring

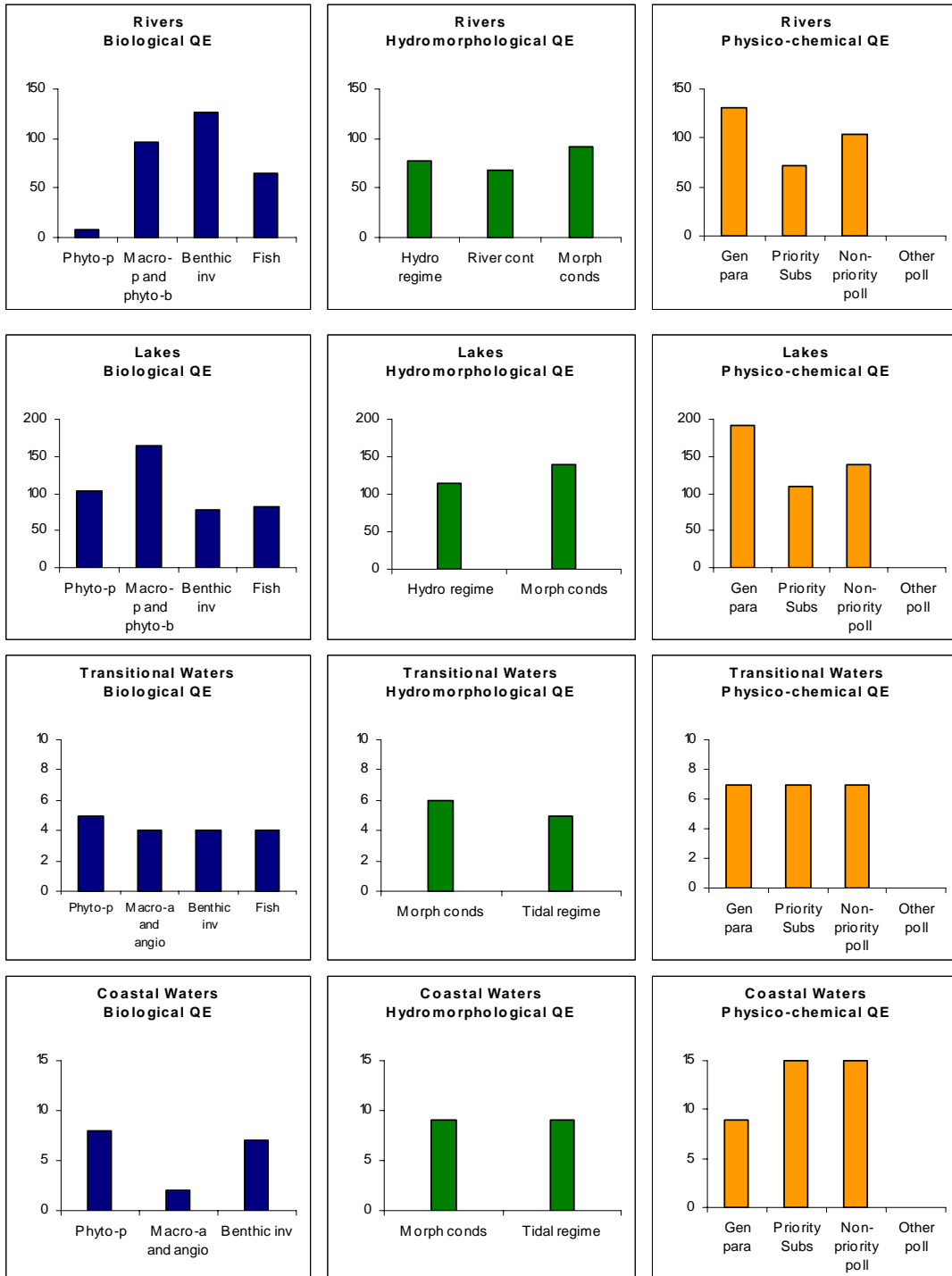
Surveillance monitoring covers all *quality elements* in all water categories except other aquatic flora in coastal waters in the Ems and the Meuse and hydromorphology of lakes in the Scheldt river basin district.

Operational monitoring programmes are structured according to water category and group of quality elements. A wide range of biological quality elements is used in what looks a targeted approach to monitor the existing pressures.

Surveillance monitoring will be carried out at the minimum *frequency* of once per 6 years as specified in the WFD across the different elements and across water categories for the four river basin districts.

Operational monitoring in all water categories is carried out every 3 years for biological quality elements except for phytoplankton, which is every year. Physico-chemical parameters and priority substances are monitored every year.

Number of stations where quality elements are monitored (surveillance and operational monitoring) in rivers, lakes, transitional and coastal waters



**GROUNDWATER**Design of Monitoring Programmes

Groundwater monitoring in all four river basin districts includes surveillance monitoring (named ‘status and trends’) and operational chemical monitoring. In addition, there is a quantitative monitoring programme which consists of three sub-programmes, i.e.

1. Salt: focuses on confirming/establishing boundaries between freshwater and brackish-/seawater;
2. Terrestrial ecosystems: focuses on changes resulting from groundwater abstraction and resulting risks to terrestrial ecosystems.
3. Regional equilibria: focuses on balance between abstraction and replenishment.

All programmes are closely linked to pre-existing monitoring programmes, which are referred to, notably monitoring of drinking water abstraction sites (Dutch drinking water regulations require raw water to be monitored by water suppliers), including sites in *drinking water protected areas*.

The surveillance and operational programmes are closely linked and designed for each water body to confirm existing chemical status and *assess any trends*. The operational programme focuses on pressures and the assessment of the effects of programmes of measures. No sub-sites have been defined.

Overall, the WFD criteria for surveillance monitoring of groundwater chemical status have been taken into account. The reports are comprehensive and clear.

There is reference to *international cooperation* at near border groundwater bodies, although the relevant international conventions are not necessarily referred to. Only one cross-border water body has been defined (in the Scheldt river basin district).

Selection of Quality Elements and Frequency of Monitoring

All *core parameters* and ‘*other pollutants*’ are monitored, some specific parameters are listed, including pesticides.

The *frequency* for quantitative monitoring is twice a month each year (all three sub-programmes). Chemical surveillance monitoring is carried out once in 6 years, whilst operational monitoring is once a year.

**FURTHER INFORMATION**

- Ministerie van Verkeer en Waterstaat / DG Water Coördinatiebureau Stroomgebieden Nederland (CSN) (2006): Samenvatting Nederlandse Monitoringprogramma’s voor de deelstroomgebieden Rijndelta, Maas, Schelde en Eems – <http://www.kaderrichtlijnwater.nl>
- Niedersächsischer Landesbetrieb für Wasserwirtschaft, Küsten- und Naturschutz, Ministerie van Verkeer en Waterstaat, Bezirksregierung Münster (2007): Rapport inzake de Monitoringprogramma's volgens Kaderrichtlijn Water in het

Stroomgebiedsdistrict Eems, Rapportage 2007 KRW – Stroomgebiedsdistrict Eems – <http://www.ems-eems.eu>

- IKSr/CIPR/ICBR (2007): Rapportage inzake de coördinatie van de toestand- en trendmonitoringsprogramma's conform artikel 8 en artikel 15, lid 2 KRW in het internationale stroomgebiedsdistrict Rijn (Rijndistrict) (deel A – rapportage) - [http://www.iksr.org/fileadmin/user\\_upload/Dokumente\\_nl/PLEN-CC\\_06-06nl\\_rev\\_15.03.07\\_m.K..pdf](http://www.iksr.org/fileadmin/user_upload/Dokumente_nl/PLEN-CC_06-06nl_rev_15.03.07_m.K..pdf)
- Internationale Maascommissie (2007): Internationaal stroomgebiedsdistrict Maas: Rapport over de coördinatie van de toestand- en trendmonitoringprogramma's in het internationaal stroomgebiedsdistrict Maas – [www.meuse-maas.be](http://www.meuse-maas.be)

#### **SUMMARY OF TECHNICAL ASSESSMENT: STRENGTHS AND WEAKNESSES**

- + Clear concept for developing the monitoring programmes following WFD requirements
- + The report is clear and of very good quality
- + International coordination
- + Comprehensive development of methods to assess ecological status
- + High density of chemical and quantitative groundwater monitoring stations
- Frequency of biological monitoring of surface waters is strictly the minimum required in the WFD

**Member State: POLAND****INFORMATION SUPPLIED**

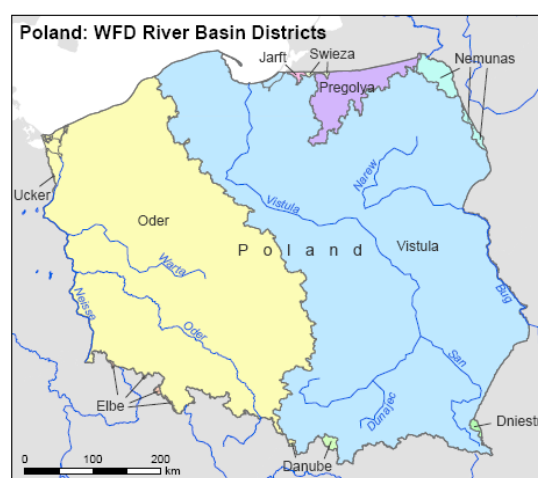
Poland has reported through WISE in the agreed format only for surface water monitoring stations for all ten river basin districts. Information on design of monitoring programmes and on groundwater monitoring stations was reported through WISE in the form of the following textual documents:

- Description of surface and groundwater monitoring programmes
- Reference to sampling standards

**FACTS AND FIGURES**

Poland has a population of 38.5 million and an area of 312,788 km<sup>2</sup>.

Poland comprises ten international river basins: Vistula, Oder, Pregola, Nemunas, Danube, Dniestr, Elbe, Jarft, Swieza and Ucker.

**River basin districts and number of water bodies**

River Basin District	Surface (km <sup>2</sup> )	% National territory	Number of river water bodies	Number of lake water bodies	Number of transitional water bodies	Number of coastal water bodies	Number of groundwater bodies
Vistula	183560	69	2660	483	5	6	
Oder	118003	38	1734	420	4	5	
Pregola	7486	2	120	101	-	-	
Nemunas	2523	1	40	36	-	-	
Danube	380	0.1	11	-	-	-	
Dniestr	243	0.08	3	-	-	-	
Elbe	226	0.07	8	-	-	-	
Jarft	207	0.03	6	-	-	-	
Swieza	154	0.05	4	1	-	-	
Ucker	6	0.002	-	-	-	-	
<b>Poland</b>	<b>312788</b>	<b>100</b>	<b>4586</b>	<b>1041</b>	<b>9</b>	<b>11</b>	<b>160</b>

**Note:** The number of groundwater bodies in each river basin district is not available. The number of water bodies in the river basin districts other than Vistula and Oder are not available..

## Numbers of surveillance, operational and quantitative monitoring stations

River Basin District	Rivers		Lakes		Transitional waters		Coastal waters		Groundwaters		
	Surv	Op	Surv	Op	Surv	Op	Surv	Op	Surv	Op	Quant
Vistula	686	876	640	31	8	13	9	3	582	28	483
Oder	458	682	483	15	9	6	7	4	336	87	321
Pregola	45	26	98	0	-	-	-	-	0	0	0
Nemunas	21	8	67	7	-	-	-	-	0	0	0
Danube	2	1	0	0	-	-	-	-	0	0	0
Dniestr	1	0	0	0	-	-	-	-	0	0	0
Elbe	4	1	0	0	-	-	-	-	0	0	0
Jarft	2	0	0	0	-	-	-	-	0	0	0
Swieza	1	0	0	0	-	-	-	-	0	0	0
Ucker	0	0	0	0	-	-	-	-	0	0	0
<b>Total</b>	<b>1218</b>	<b>1594</b>	<b>1288</b>	<b>53</b>	<b>17</b>	<b>19</b>	<b>16</b>	<b>7</b>	<b>918</b>	<b>115</b>	<b>804</b>
<b>Total number of monitoring stations</b>	<b>2235</b>		<b>1312</b>		<b>28</b>		<b>16</b>		<b>933</b>		<b>804</b>

**Note:** Total number of monitoring stations is not necessarily the sum of surveillance and operational as there are stations that serve both purposes

## Number of monitoring stations in protected areas reported under the WFD

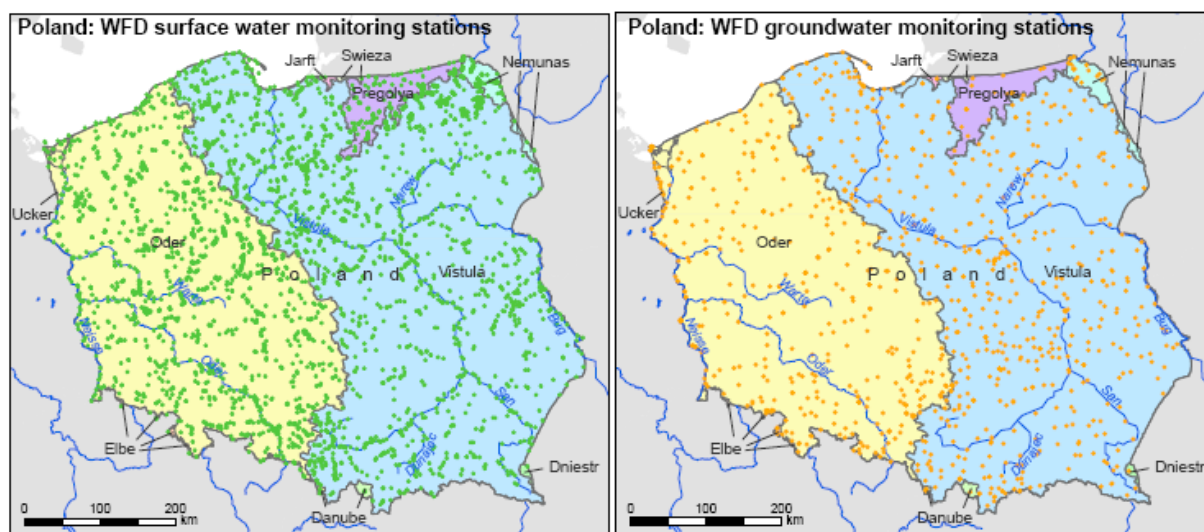
River Basin District	Surface water							Ground water
	Bathing Water	Habitats / Birds	Drinking Water	Fish	Shellfish	Nitrates	Urban waste water	Drinking water
Vistula	4	266	39	535		155	-	
Oder		183	7	358		87	-	
Pregola		13		26			-	
Nemunas		49		4			-	
Danube		1		2		1	-	
Dniestr				1			-	
Elbe		2		3			-	
Jarft				1			-	
Swieza							-	
Ucker							-	
<b>Total</b>	<b>4</b>	<b>514</b>	<b>46</b>	<b>930</b>		<b>243</b>	<b>-</b>	

**Notes:**

1. The reporting of monitoring of protected areas under the Water Framework Directive was due only if the information was not reported under other directives. A total of 3840 surface water monitoring stations for nitrates have been reported by Poland under the Nitrates Directive in 2008 (reference period 2004-2007). 320 surface water monitoring stations were reported under the Bathing Water Directive (bathing season 2007). Those figures are preliminary as quality checking is on-going at the time this report is written.

2. Poland applies more stringent waste water treatment in the whole of its territory and therefore, in accordance to article 5.8 of the Urban Waste Water Directive 1991/271/EEC, it is exempted from designation of specific sensitive areas.

### Location of surface water and groundwater monitoring stations



## SURFACE WATER MONITORING PROGRAMMES

### Design of Monitoring Programmes

Data on the monitoring programmes was presented for Odra and Vistula river basin districts. It is reported that the same rules are applied for monitoring of all smaller river basin districts (other than Odra and Vistula), however it is unclear if monitoring programmes were designed for them. No monitoring sites were reported for Ucker river basin district.

*Surveillance* and *operational monitoring* programmes are reported for all four water categories.

The objectives of *surveillance* and *operational monitoring* are listed in the report and some are a replication of the objectives given in the WFD. There are no separate sub-programmes designed to meet the individual specific objectives.

It is not clear whether the results of the 2004 pressure and impact analysis as well as for detecting long term changes in natural conditions, have been incorporated into the design of *surveillance* monitoring programme. Furthermore no reference sites that may be monitored to detect natural changes were reported. *Surveillance* monitoring was also based on selection of monitoring sites with the appropriate sampling frequencies that will preserve the continuity of a series of measurements to detect long term changes due to anthropogenic pressures. However the site selection criteria for *surveillance* monitoring for transitional and coastal waters have not been used.

The objectives of *operational monitoring* are included in the design for rivers, transitional and coastal waters but it is unclear if it was included for lakes. Start of *operational monitoring* was delayed due to lack of the methodologies and metrics for some quality elements developed on time.

*Investigative monitoring* is reported to be undertaken in cases where the reasons for failure of environmental objectives is not known, and to determine the size and impacts of accidental pollution.

Some additional requirements are mentioned for *drinking water* protected areas, however it is not clear whether this objective is introduced into the monitoring programmes.

The report states that the selection of water bodies for monitoring takes into account *protected areas* for *drinking water abstraction*, habitat and species, bathing waters. However, the monitoring sites reported do not include these areas.

There is very limited information on *international coordination* in designing monitoring networks (HELCOM's COMBINE monitoring manual is mentioned).

### Development of Biological Assessment Methods

A number of standards are mentioned in relation with the biological quality elements but there is no reference to assessment methods. Therefore, they have been considered as under development. It was also indicated that evaluation methods for hydromorphological quality elements were being tested and developed. No information on *levels of confidence and precision* has been provided.

#### Summary of available biological assessment methods

	Rivers				Lakes				Transitional Waters				Coastal Waters		
	Phytoplankton	Macrophytes and Phytobenthos	Benthic invertebrates	Fish	Phytoplankton	Macrophytes and Phytobenthos	Benthic invertebrates	Fish	Phytoplankton	Macroalgae and Angiosperms	Benthic invertebrates	Fish	Phytoplankton	Macroalgae and Angiosperms	Benthic invertebrates
Poland	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

Method available ■ Under development or incomplete information ■ Not developed or no information ■ Not relevant -

**Note:** In the context of the WFD intercalibration exercise, Poland has intercalibrated the national assessment method for macroinvertebrates in rivers. In addition, Poland has intercalibrated a parameter indicative of biomass of phytoplankton in lakes and in coastal and transitional waters (chlorophyll-a) (see Commission Decision 2008/915/EC of 30 October 2008 establishing, pursuant to Directive 2000/60/EC of the European Parliament and of the Council, the values of the Member State monitoring system classifications as a result of the intercalibration exercise, available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:332:0020:0044:EN:PDF>).

### Selection of Quality Elements and Frequency of Monitoring

All biological quality elements are reported to be monitored in the *surveillance monitoring* of rivers and lakes. All biological quality elements for coastal and transitional waters are also reported except macroalgae. Some sites are reported to be used for monitoring macrophytes and phytobenthos in transitional and coastal waters.

No hydromorphological quality elements are reported to be monitored for any water category both for *surveillance and operational monitoring*.

*Priority substances* are generally reported for all water categories but often it is only river monitoring that include other specific pollutants .

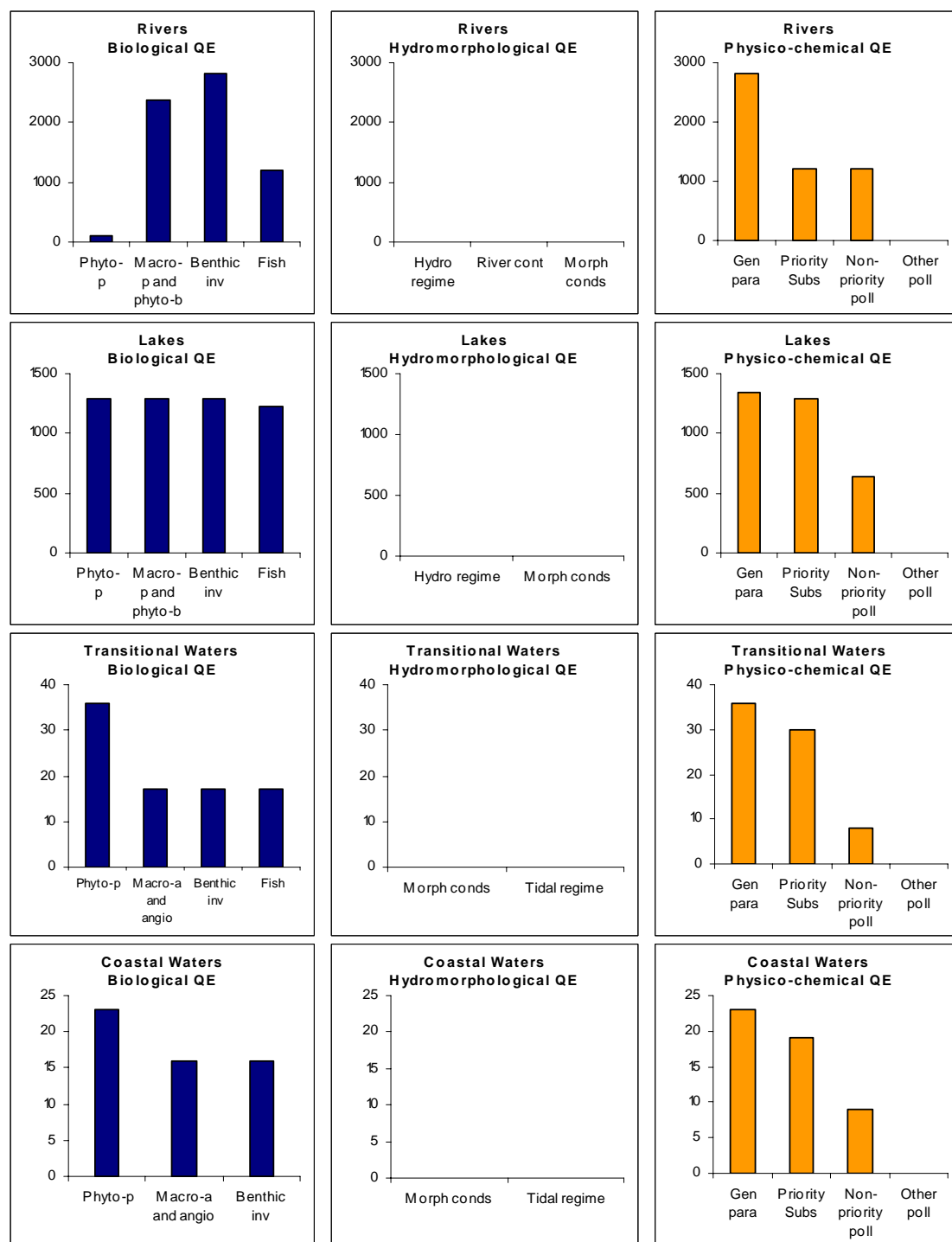
In *operational monitoring* for lakes sensitive quality elements are selected in relation to the types of pressures. No information provided for rivers, transitional and coastal waters.

For some river basin districts for the operational monitoring of lakes only physico-chemical quality elements are included. In transitional and coastal waters often the only biological quality element included is phytoplankton and in rivers 2-3 biological quality elements are generally monitored but there is no monitoring of fish and macrophytes. *Priority substances* are only reported for transitional and coastal waters.

No information was provided on *investigative monitoring*.

There is very limited information on monitoring cycles. General statement is made that annual *frequency of measurements* are in accordance with the WFD and there are only a few specific examples such as phytoplankton, physical and chemical properties in lakes for surveillance monitoring will be monitored 6-8 times in each year of the 6 year plan.

**Number of stations where quality elements are monitored (surveillance and operational monitoring) in rivers, lakes, transitional and coastal waters**



**GROUNDWATER MONITORING PROGRAMMES**

Design of Monitoring Programmes

Groundwater monitoring programmes cover only Odra and Vistula, while for other river basin districts only general information is provided.

There are specific monitoring programmes for chemical *surveillance monitoring*, *operational monitoring* and for groundwater level monitoring. For each programme, the information is comprehensive and sufficient. There is evidence that the results of 2004 analysis and that the criteria for groundwater surveillance monitoring have been taken into account.

There is specific *surveillance monitoring* to monitor background levels and long-term trends. It is indicated that *operational monitoring* will start later than December 2006. Although, quantitative and surveillance monitoring will take place by December 2006, the monitoring network is being developed between 2007 and 2009 and will be fully in place by 2010.

There is comprehensive information provided on monitoring of *protected areas*. Specific arrangements are indicated for *drinking water*, nitrates and Natura 2000 sites (established on the basis of Habitats and Birds Directives).

Although river basin districts are *international*, there are *no transboundary groundwater bodies* designated with the neighbouring countries.

#### Selection of Quality Elements and Frequency of Monitoring

Chemical *surveillance monitoring* covers all core and other parameters. Parameters characteristic of anthropogenic pollution will also be monitored.

*Operation monitoring* includes conductivity, pH and temperature and indicators which value on the basis of surveillance monitoring had exceeded the limits and characteristic of anthropogenic impact on the groundwater bodies.

The cycle and *frequency of monitoring* varies across programmes. For *quantitative monitoring*, of groundwater level is reported to be monthly. However, depending on the type of aquifer and the risk, it can be increased to a weekly monitoring. By the end of 2009, continuous monitoring will be carried out.

For *surveillance monitoring*, the minimum frequency is reported to be once every 6 years. However, depending on the types of aquifer, the frequency can be increased to once every 3 years.

For *operational monitoring*, it takes place in between periods of surveillance monitoring and the minimum frequency is reported to be once a year. This can be increased to twice a year depending on the type of aquifer.

#### **FURTHER INFORMATION**

Raport dla Komisji Europejskiej: program monitoringu wód powierzchniowych i podziemnych w Polsce według wymagań Dyrektywy 2000/60/WE (Description of surface and groundwater monitoring programmes)

Załącznik Ia: Zestawienie technik badań terenowych i analizy laboratoryjnej dla elementów biologicznych, fizykochemicznych i chemicznych. – (Reference to sampling standards)

**SUMMARY OF TECHNICAL ASSESSMENT: STRENGTHS AND WEAKNESSES**

- + The report provides information on the monitoring of protected areas
- The concept to design WFD monitoring programmes is not fully clear
- Only part of the report was submitted through WISE
- Methods are not available or under development
- No monitoring on hydromorphology

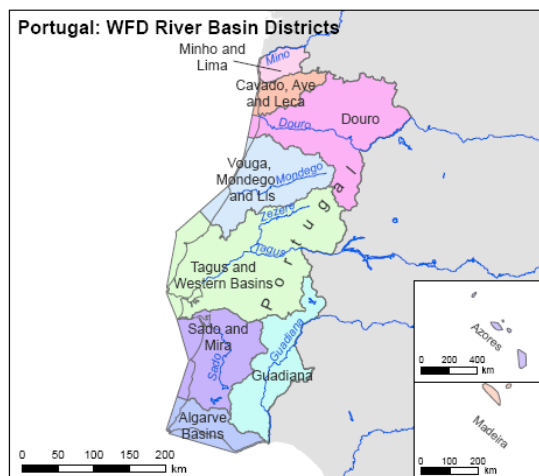
Member State: PORTUGAL

INFORMATION SUPPLIED

Portugal has reported through WISE in the agreed format for 8 mainland river basin districts. No information has been reported for the island river basin districts Açores and Madeira.

FACTS AND FIGURES

Portugal has a population of 10.6 million (Eurostat, 2007) and an area of 109,480 km<sup>2</sup>. Portugal shares four international river basins with Spain: Tagus and Western Basins, Douro, Guadiana, and Minho and Lima



River basin districts and number of water bodies

River Basin District	Surface (km <sup>2</sup> )	% National territory	Number of river water bodies	Number of lake water bodies	Number of transitional water bodies	Number of coastal water bodies	Number of groundwater bodies
Tagus	25665	23	393	24	4	2	12
Douro	19219	18	353	17	3	2	3
Vouga, Mondego, Lis and Western Basins	16981	16	236	9	10	8	30
Sado and Mira	12149	11	200	19	9	3	8
Guadiana	11611	11	216	16	4	1	9
Azores	10047	9	13	24	3	27	54
Algarve Basins	5511	5	64	3	3	10	23
Cavado, Ave and Leca	3584	3	69	7	6	1	4
Minho and Lima	2465	2	55	3	10	1	2
Madeira	2248	2	94	-	-	8	4
<b>Portugal</b>	<b>109480</b>	<b>100</b>	<b>1693</b>	<b>122</b>	<b>52</b>	<b>63</b>	<b>149</b>

Note: There are no natural lakes in mainland Portugal, only reservoirs.

Numbers of surveillance, operational and quantitative monitoring stations

River Basin District	Rivers		Lakes		Transitional waters		Coastal waters		Groundwaters		
	Surv	Op	Surv	Op	Surv	Op	Surv	Op	Surv	Op	Quant
Tagus	80	77	7	11	4	0	2	0	101	48	71
Douro	62	65	4	12	3	0	1	0	7	0	10
Vouga, Mondego, Lis and Western Basins	66	61	4	5	9	0	4	0	117	57	86
Sado and Mira	21	31	2	7	9	0	3	0	20	0	8
Guadiana	16	41	3	9	4	0	1	0	30	52	26
Azores	4	20	1	23	0	3	24	3	101	0	0
Algarve Basins	20	12	3	0	3	0	2	0	59	31	115
Cavado, Ave and Leca	15	24	6	2	7	0	1	0	9	23	8
Minho and Lima	21	5	1	0	1	0	0	0	6	0	4
Madeira	28	10	-	-	-	-	11	0	15	9	16
<b>Total</b>	<b>333</b>	<b>346</b>	<b>31</b>	<b>69</b>	<b>40</b>	<b>3</b>	<b>49</b>	<b>3</b>	<b>465</b>	<b>220</b>	<b>344</b>
<b>Total number of monitoring stations</b>	<b>679</b>		<b>100</b>		<b>43</b>		<b>52</b>		<b>685</b>		<b>344</b>

Note:

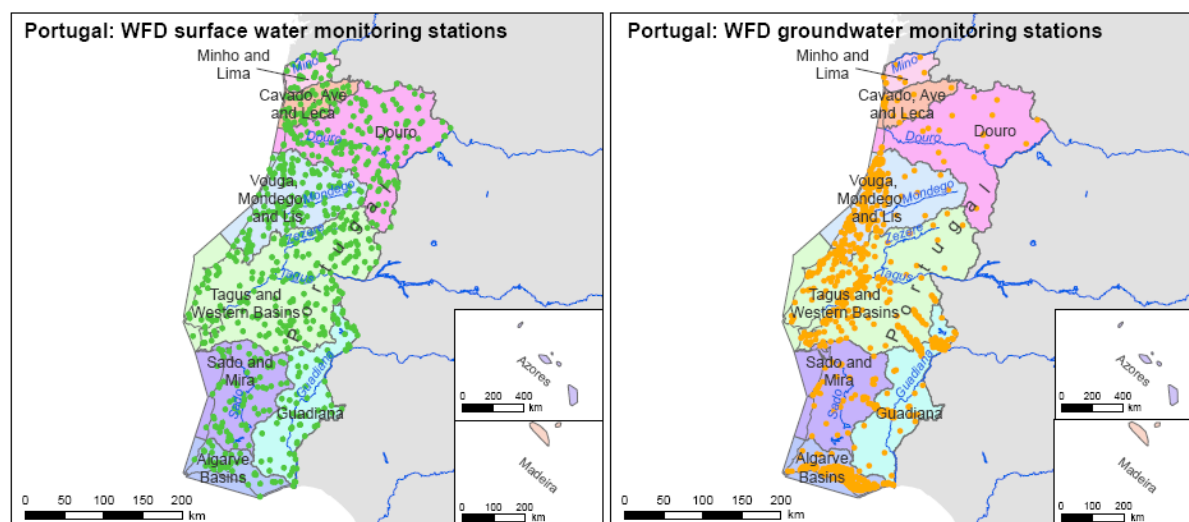
1. Total number of monitoring stations is not necessarily the sum of surveillance and operational as there are stations that serve both purposes
2. The number of monitoring stations in Azores and Madeira were reported in January 2009. No further information was provided on those and have not been taken into account in the rest of the report.

Number of monitoring stations in protected areas reported under the WFD

River Basin District	Surface water							Ground water
	Bathing Water	Habitats / Birds	Drinking Water	Fish	Shellfish	Nitrates	Urban waste water	Drinking water
Tagus		6	24		-		2	24
Douro		18	45		-		4	7
Vouga, Mondego, Lis and Western Basins		6	30		-		2	44
Sado and Mira		4	4		-		2	16
Guadiana		17	9		-		1	13
Azores		23	2	-	-		-	100
Algarve Basins		3	2		-		1	1
Cavado, Ave and Leca			10		-		0	9
Minho and Lima			12		-		0	6
Madeira				-	-		-	23
<b>Total</b>		<b>77</b>	<b>138</b>		<b>-</b>		<b>12</b>	<b>243</b>

Note: the reporting of monitoring of protected areas under the Water Framework Directive was due only if the information was not reported under other directives. A total of 168 surface water monitoring stations for nitrates have been reported by Portugal under the Nitrates Directive in 2008 (reference period 2004-2007). 564 surface water monitoring stations were reported under the Bathing Water Directive (bathing season 2007). Those figures are preliminary as quality checking is on-going at the time this report is written.

### Location of surface water and groundwater monitoring stations



## SURFACE WATER

### Design of monitoring programmes

Reporting across the different river basin districts is very homogeneous showing that the same concept was applied across the country. In general the reports contain enough information to understand the main elements about the design of the monitoring programmes.

The design of the *surveillance monitoring* is largely based on the criteria of WFD Annex V. In case of transitional waters, all water bodies are monitored due to the limited knowledge existing about this water category. There are no natural lakes in mainland Portugal, but the reservoirs are monitored.

There are no *operational monitoring* programmes for coastal and transitional waters. For rivers and lakes (reservoirs), the water bodies identified in WFD article 5 pressure and impact analysis as at risk of failing to meet the WFD objectives are mentioned as the main target of the operational monitoring.

The starting date of the monitoring programmes is reported to have been delayed to 1 July 2007 due to administrative and financial reasons.

All river basin districts report *investigative programmes*, and include an explanation about the strategic approach based on continuous monitoring instruments. No specific incidents or examples are reported.

The reports do not provide information about *monitoring of protected areas* (the figures in the table above were provided in January 2009). In particular, none of the reports provide clear enough information to determine if monitoring of drinking water protected areas has been considered in monitoring design.

There is no information about *international coordination* for any of the river basin districts.




Development of biological assessment methods

Information on the assessment methods for the biological quality elements is provided. In general the descriptions are more detailed for rivers and lakes showing a higher degree of development. The information is far less detailed for coastal and transitional waters. There are generic references to methods used in the intercalibration exercise for quality elements that have not been intercalibrated or have been intercalibrated only at parameter level. These have been considered under developed. There is no reference to methods for macroinvertebrates, macrophytes and phytobenthos in lakes; although some of those quality elements may not be relevant for the reservoirs in mainland Portugal, they can be for natural lakes in Azores.

Only brief information is provided on the levels of confidence, in general assuming that the minimum frequencies for biological monitoring included in the WFD would deliver an acceptable level of confidence, but without further justification.

**Summary of available biological assessment methods**

	Rivers				Lakes				Transitional Waters				Coastal Waters		
	Phytoplankton	Macrophytes and Phytobenthos	Benthic invertebrates	Fish	Phytoplankton	Macrophytes and Phytobenthos	Benthic invertebrates	Fish	Phytoplankton	Macroalgae and Angiosperms	Benthic invertebrates	Fish	Phytoplankton	Macroalgae and Angiosperms	Benthic invertebrates
Portugal	Red	Green	Green	Green	Green	Red	Red	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow

Method available  Under development or incomplete information  Not developed or no information  Not relevant -

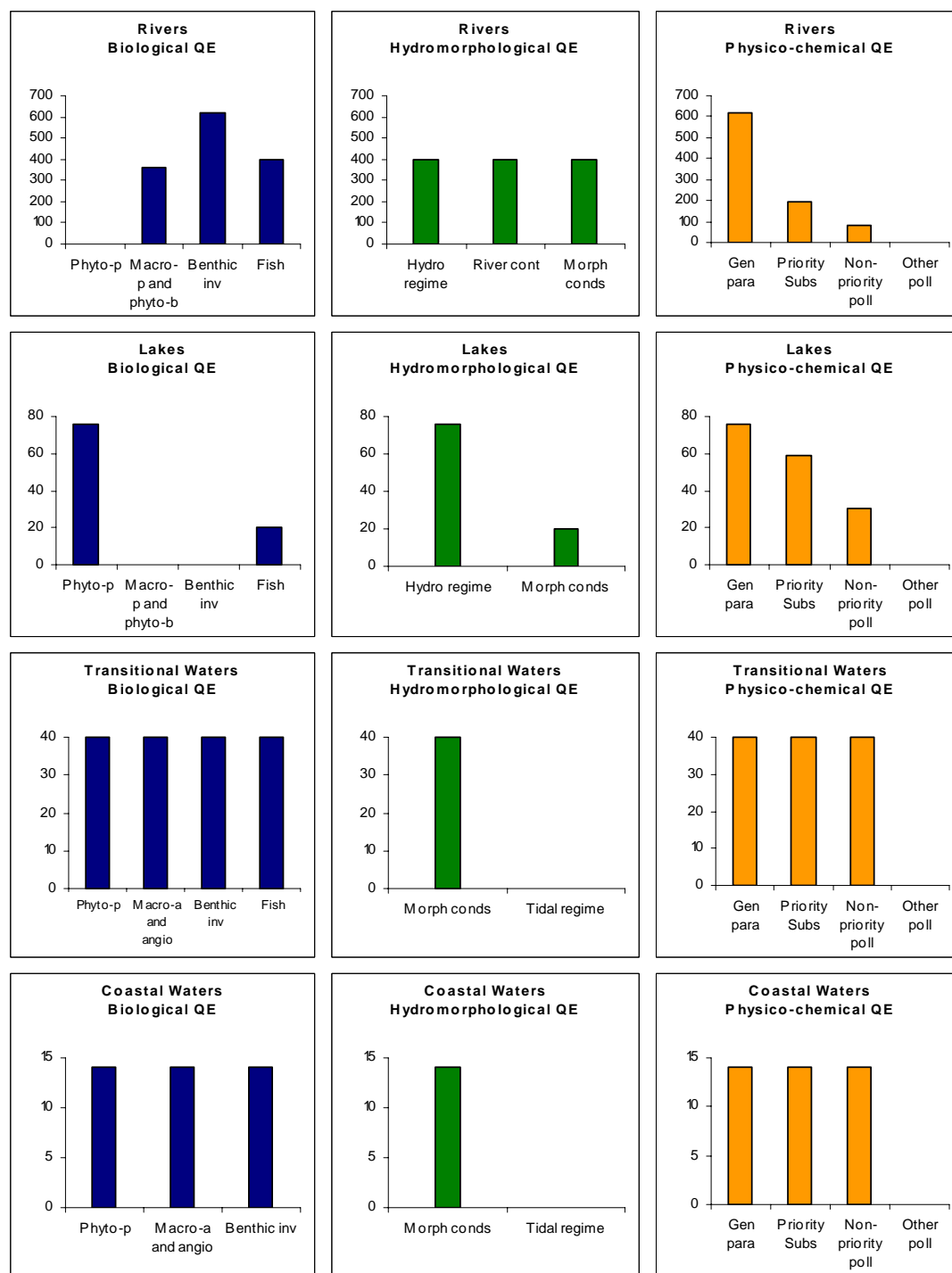
**Note:** In the context of the WFD intercalibration exercise, Portugal has intercalibrated the national assessment methods for macroinvertebrates in rivers (Central and Mediterranean geographical areas), phytobenthos in rivers (Mediterranean only) and macroinvertebrates in coastal waters. In addition, Portugal has intercalibrated parameters indicative of biomass and of taxonomic composition and abundance of phytoplankton in Mediterranean reservoirs, parameters indicative of biomass and of blooms of phytoplankton in coastal waters and a parameter indicative of composition of macroalgae in coastal waters (see Commission Decision 2008/915/EC of 30 October 2008 establishing, pursuant to Directive 2000/60/EC of the European Parliament and of the Council, the values of the Member State monitoring system classifications as a result of the intercalibration exercise, available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:332:0020:0044:EN:PDF>).

Selection of quality elements and frequency of monitoring

Surveillance monitoring in rivers covers all quality elements except priority substances in Sado river basin district and other specific pollutants in Sado and in Tagus. Other aquatic flora and macroinvertebrates are not monitored in lakes but those are only reservoirs (there are no natural lakes in mainland Portugal) and the report states that those quality elements are not relevant. Other specific pollutants are not monitored in lakes in Cavado and Vouga river basin districts. In transitional and coastal waters the surveillance monitoring covers all quality elements.

Monitoring of biological quality elements both in surveillance and operational monitoring is carried out every two years except for phytoplankton, that is done every year. Priority substances are monitored between 3 and 6 times every year.

**Number of stations where quality elements are monitored (surveillance and operational monitoring) in rivers, lakes, transitional and coastal waters**



**GROUNDWATER**

Design of Monitoring Programmes

In most river basin districts there are 3 specific monitoring programmes for quantitative assessment, chemical surveillance and operational monitoring. Some river basin districts have however no operational monitoring programmes.

The report provides some information on methodology - it lists criteria taken into account such as hydrogeology, regular distribution, easy access, away from impacts from abstraction, well/springs but it is not clear if validation of pressure and impact results or long-term trends have been into account.

The report does not mention the criteria in the WFD Annex V 2.4.2. Based on the reported information, it seems that the monitoring sites were not chosen according to prior risk assessment information.

It is reported that design criteria included monitoring sites near drinking water abstraction points. In the stations reports, it is indicated that some of the monitoring sites are also used for the abstraction of drinking water.

Although there are international river basin districts, there is no information on additional requirements for transboundary groundwater bodies.

There is no information on other monitoring requirements, except for the Nitrates Directive when there is an operational monitoring programme, it is designed to be compatible with the Nitrates directive monitoring requirements.

#### Selection of Quality Elements and Frequency of Monitoring

Only core parameters are reported to be monitored. When there is an operational monitoring, it is targeted specifically at nitrates pollution from agriculture.

Groundwater level measurements will take place annually every month.

Monitoring of core parameters will be carried out annually twice a year, covering dry and wet seasons.

#### **FURTHER INFORMATION**

No further information was provided.

#### **SUMMARY OF TECHNICAL ASSESSMENT: STRENGTHS AND WEAKNESSES**

- + Frequency of monitoring of biological quality elements higher than the minimum required in the WFD
- No report for Azores and Madeira
- No mentioning of international coordination
- Monitoring of protected areas is lacking

## Member State: ROMANIA

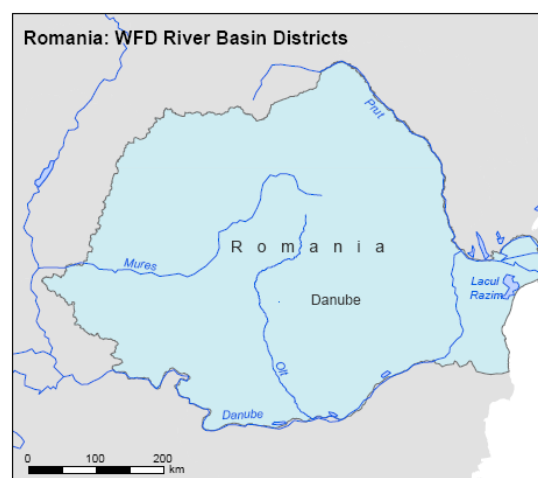
## INFORMATION SUPPLIED

Romania has reported both for surface water and groundwater a word report (RAPORT NATIONAL 2006 – Monitoring system of Romanian waters under Article 8(1) and (2) and Article 5 of the WFD 2000/60/EC) and excel spreadsheets for one river basin district (Danube). The report represents a synthesis of monitoring programmes for 11 separate hydrological sub-basins. Romania has reported also through WISE in agreed format on 19 December 2008 and 22 January 2009<sup>1</sup>. Due to the late reporting, this information could not be fully taken into account in this report.

## FACTS AND FIGURES

Romania has a population of 21.6 million and an area of 238,391 km<sup>2</sup>.

Romania is situated entirely within the Danube international river basin.



## River basin districts and number of water bodies

River Basin District	Surface (km <sup>2</sup> )	% National territory	Number of river water bodies	Number of lake water bodies	Number of transitional water bodies	Number of coastal water bodies	Number of groundwater bodies
Danube	238391	100	3300	126	2	4	142
<b>Romania</b>	<b>238391</b>	<b>100</b>	<b>3300</b>	<b>126</b>	<b>2</b>	<b>4</b>	<b>142</b>

**Note:** Out of the 3300 river water bodies 168 are reservoirs and 1197 are temporary (non-permanent) water bodies

## Number of surveillance, operational and quantitative monitoring stations

River Basin District	Rivers		Lakes		Transitional waters		Coastal waters		Groundwaters		
	Surv	Op	Surv	Op	Surv	Op	Surv	Op	Surv	Op	Quant
Danube	1519	643	467	266	18	18	39	39	2500	1142	3363
<b>Total</b>	<b>1519</b>	<b>643</b>	<b>467</b>	<b>266</b>	<b>18</b>	<b>18</b>	<b>39</b>	<b>39</b>	<b>2500</b>	<b>1142</b>	<b>3363</b>
<b>Total number of monitoring stations</b>	<b>1519</b>		<b>467</b>		<b>18</b>		<b>39</b>		<b>2500</b>		<b>3363</b>

**Note:** Total number of monitoring stations is not necessarily the sum of surveillance and operational as there are stations that serve both purposes

<sup>1</sup> Due to the quality assurance/quality control process the information was only available on 19 February 2009.

### Number of monitoring stations in protected areas reported under the WFD

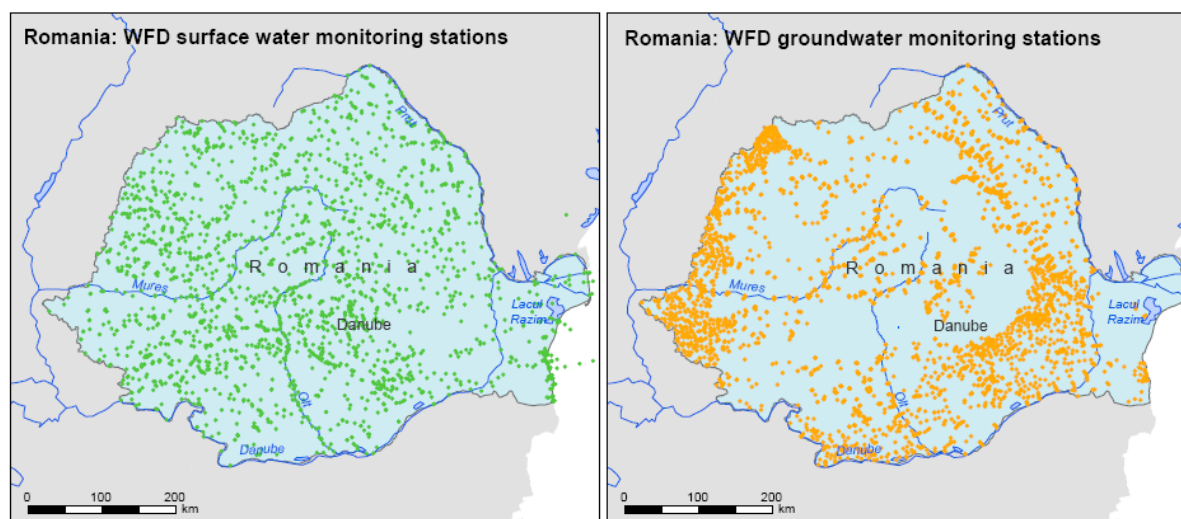
River Basin District	Surface water							Ground water
	Bathing Water	Habitats / Birds	Drinking Water	Fish	Shellfish	Nitrates	Urban waste water	Drinking Water
Danube		249	113	313		301	-	97
<b>Total</b>		<b>249</b>	<b>113</b>	<b>313</b>		<b>301</b>	<b>-</b>	<b>97</b>

#### Notes:

1. The reporting of monitoring of protected areas under the Water Framework Directive was due only if the information was not reported under other directives. A total of 1301 surface water monitoring stations for nitrates have been reported by Romania under the nitrates Directive in 2008 (reference period 2004-2007). 49 surface water monitoring stations were reported under the bathing water directive (bathing season 2007). Those figures are preliminary as quality checking is on-going at the time this report is written.

2. Romania applies more stringent waste water treatment in the whole of its territory and therefore, in accordance to article 5.8 of the Urban Waste Water Directive 1991/271/EEC, it is exempted from designation of specific sensitive areas.

### Location of surface water and groundwater monitoring stations



## SURFACE WATER MONITORING PROGRAMMES

### Design of Monitoring Programmes

The national report describes separate *surveillance* and *operational monitoring programmes* each of which includes all four water categories.

The available information indicates that all the main objectives and site selection requirements of the WFD have been taken into account in the surveillance and operational monitoring programmes.

It is also mentioned that the results of the WFD risk assessment have been used in relation to the development of monitoring programmes. The *level of confidence and precision* in the WFD impact assessment is reported to be relatively low (not all the quality elements requested by the WFD have been monitored at that time). Consequently the surveillance monitoring was initially more extensive for the representative stations (in terms of numbers of

water bodies, sites and quality elements) than it subsequently increase the reliability of status assessments etc.

The strategy on *investigative monitoring* and early warning monitoring and information systems in cases of national and transboundary accidental pollution are reported to be in place in Romania .

The national report indicates that *drinking water protected areas* are monitored. Also it is mentioned that *protected areas* established under other EU Directives are monitored.




The report also includes information about monitoring under Romania’s *international commitments* such as the Danube Convention (TNMN – TransNational Monitoring Network), Black Sea Convention, WISE-SoE (formerly EIONET–Water) and bilateral agreements with neighbouring countries.

Development of Biological Assessment Methods

The national report does not provided a description of the methods of sampling, analysis or assessment for any of the quality elements. However a separate file provides a tabulated list of standard methods for sampling and various analytical methods. In some cases there are references to methods developed in research projects but there are no description of methods to assess ecological status. It has been considered that all the methods are under development but the information is not clear on the current status of development. Also there is insufficient information on levels of confidence and precision for their assessment methods.

**Summary of available biological assessment methods**

	Rivers				Lakes				Transitional Waters				Coastal Waters		
	Phytoplankton	Macrophytes and Phytobenthos	Benthic invertebrates	Fish	Phytoplankton	Macrophytes and Phytobenthos	Benthic invertebrates	Fish	Phytoplankton	Macroalgae and Angiosperms	Benthic invertebrates	Fish	Phytoplankton	Macroalgae and Angiosperms	Benthic invertebrates
Romania															

Method available  Under development or incomplete information  Not developed or no information  Not relevant -

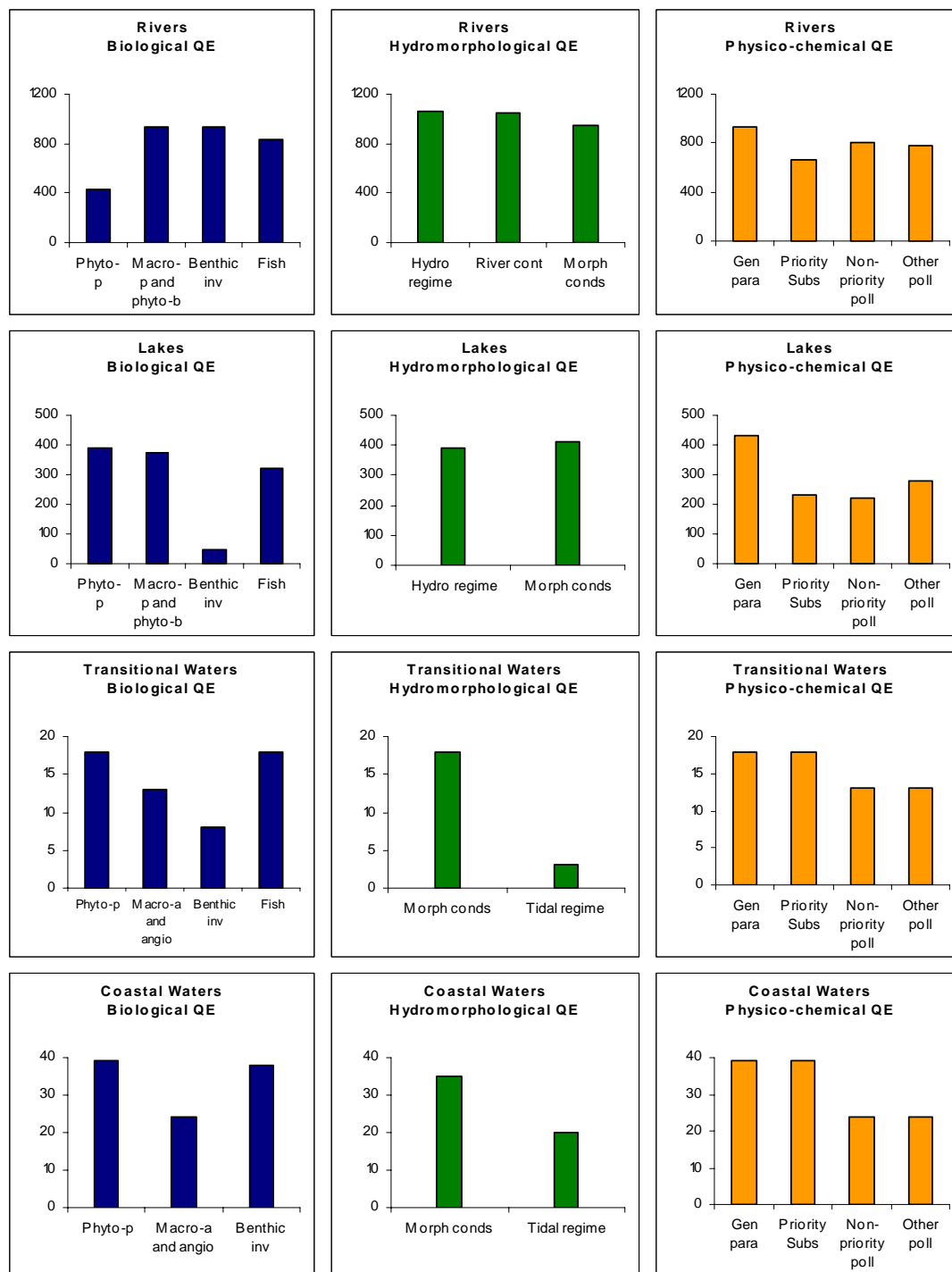
**Note:** In the context of the WFD intercalibration exercise, Romania has intercalibrated parameters indicative of biomass and of taxonomic composition and abundance of phytoplankton in Mediterranean lakes (reservoirs only) and has intercalibrated with Bulgaria some metrics for phytoplankton and macroinvertebrates in coastal waters, but not fully developed national assessment systems (see Commission Decision 2008/915/EC of 30 October 2008 establishing, pursuant to Directive 2000/60/EC of the European Parliament and of the Council, the values of the Member State monitoring system classifications as a result of the intercalibration exercise, available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:332:0020:0044:EN:PDF>).

Selection of Quality Elements and Frequency of Monitoring

All quality elements with all relevant parameters are included in the *surveillance monitoring* of all water categories.

The results of the WFD risk assessment is considered to be unreliable and therefore the whole range of quality elements is selected for the *operational monitoring* instead of selection of quality elements sensitive to specific type of pressure/impact.

**Number of stations where quality elements are monitored (surveillance and operational monitoring) in rivers, lakes, transitional and coastal waters**



The national report shows that the surveillance and operational monitoring for biological quality elements is carried out every year for the 6 years of the river basin management cycle, except for macrophytes in rivers and lakes, fish in all relevant water categories and

angiosperms in transitional and coastal waters, which is every 3 years. Priority substances are monitored every year in all water categories.

## **GROUNDWATER**

### Design of Monitoring Programmes

The national report describes separate *quantitative, chemical operational and chemical surveillance monitoring programmes*. There are monitoring sites used for quantitative, surveillance and operational monitoring. In general the objectives of groundwater monitoring as listed in the WFD are reproduced in the national report with varying degrees of supportive information that illustrate how these objectives have been incorporated into the programme design.

In terms of quantitative monitoring the primary objective of validating the characterisation made in accordance with Article 5 appears to be incorporated in the design of the monitoring programme.

Similarly some of the objectives for chemical surveillance monitoring (e.g. validation of the results of the pressures and impacts analysis) and for chemical operational monitoring (e.g. assessment of status of water bodies at risk) are included in the programmes design. Monitoring sites have been selected in relation to a number of criteria including the presence of anthropogenic pressures and pollution (e.g. agricultural nitrates and dangerous substances), in terms of Protected Areas (e.g. drinking water abstraction areas) and WISE-SoE network. This is supported by the reporting of monitoring parameters for each monitoring site which shows some differences in the selection of parameter between sites possibly reflecting ambient pressures and pollutants.

However, it is not clear if the selection of monitoring sites for surveillance and operational monitoring includes as a criterion the detection of long term trends. Also the information on monitoring frequencies does not provide supportive information that this criterion has been included. There is no mention of evaluating groundwater background levels of parameters and pollutants. It is therefore not clear whether this objective for both chemical operational and surveillance monitoring has been integrated into the monitoring programmes.

The national report states that monitoring of groundwater is supplemented by additional specific programmes for *protected areas for abstraction of drinking water*. It also states that all bodies of water that are used as sources of drinking water are included in operational and surveillance monitoring. The inventories of groundwater sites indicate that some sites are associated with protected areas for drinking water abstractions and with Nitrate Vulnerable Zones. There is no information for other protected areas.

Romania has reported that some sites are associated with other international commitments which are bilateral agreements with neighbouring countries.

### Selection of Quality Elements and Frequency of Monitoring

All core parameters and other indicative parameters are reported to be included in *chemical surveillance and operational monitoring*.

Groundwater level monitoring is reported to be undertaken between twice and 12 times per year. Chemical surveillance monitoring of general parameters will be undertaken every 6 years. The frequency of sampling for operational monitoring is twice per year in every year of the first planning cycle. *Drinking water* abstractions will be monitored quarterly every year.

**FURTHER INFORMATION**

There is no links in the national report to further sources of information neither for surface waters nor for groundwater.

**SUMMARY OF TECHNICAL ASSESSMENT: STRENGTHS AND WEAKNESSES**

- + Good density of monitoring stations in both surface and groundwaters, good coverage of quality elements and annual frequency of monitoring
- + International coordination
- + Monitoring of protected areas for surface and groundwater
- Late submission in WISE
- Availability of methods for the assessment of ecological status

## Member State: SLOVAK REPUBLIC

## INFORMATION SUPPLIED

The Slovak Republic (Slovakia) has reported through WISE in the agreed format for its two river basin districts. Reference is made to more detailed information on monitoring programmes and respective methodologies, but no web links were provided.

## FACTS AND FIGURES

Slovakia has a population of 5.4 million (Eurostat, 2007) and an area of 49,032 km<sup>2</sup>.

Slovakia is situated in two international river basins: Danube and Vistula.

Slovakia has no transitional or coastal waters.



## River basin districts and number of water bodies

River Basin District	Surface (km <sup>2</sup> )	% National territory	Number of river water bodies	Number of lake water bodies	Number of transitional water bodies	Number of coastal water bodies	Number of groundwater bodies
Danube	47072	96	1654	23	-	-	96
Vistula	1960	4	83	-	-	-	5
<b>Slovakia</b>	<b>49032</b>	<b>100</b>	<b>1737</b>	<b>23</b>	<b>-</b>	<b>-</b>	<b>101</b>

## Number of surveillance, operational and quantitative monitoring stations

River Basin District	Rivers		Lakes		Transitional waters		Coastal waters		Groundwaters		
	Surv	Op	Surv	Op	Surv	Op	Surv	Op	Surv	Op	Quant
Danube	532	584	23	8	-	-	-	-	122	406	1468
Vistula	33	31	-	-	-	-	-	-	8	7	39
<b>Total</b>	<b>565</b>	<b>615</b>	<b>23</b>	<b>8</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>130</b>	<b>413</b>	<b>1507</b>
<b>Total number of monitoring stations</b>	<b>768</b>		<b>31</b>		<b>-</b>		<b>-</b>		<b>543</b>		<b>1507</b>

**Note:** Total number of monitoring stations is not necessarily the sum of surveillance and operational as there are stations that serve both purposes

## Number of monitoring stations in protected areas reported under the WFD

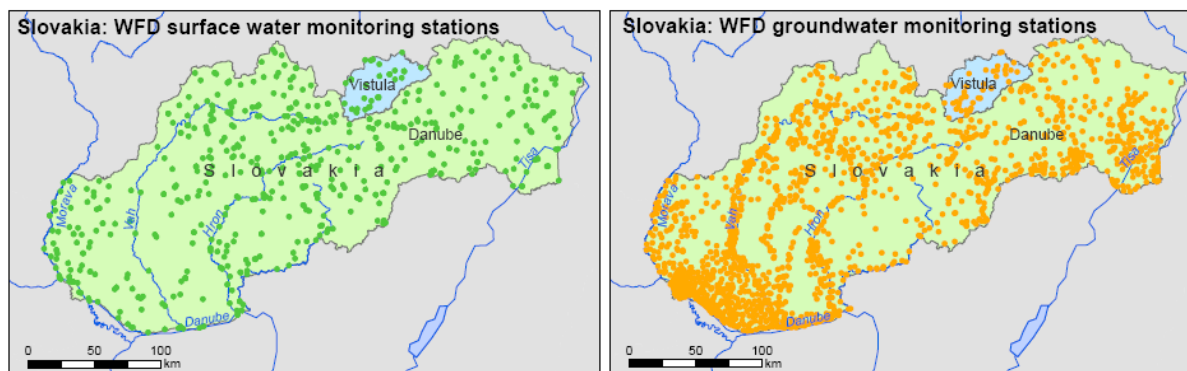
River Basin District	Surface water							Ground water
	Bathing Water	Habitats / Birds	Drinking Water	Fish	Shellfish	Nitrates	Urban waste water	Drinking Water
Danube			82		-		-	
Vistula					-		-	
<b>Total</b>			<b>82</b>		-		-	

## Notes:

1. The reporting of monitoring of protected areas under the Water Framework Directive was due only if the information was not reported under other directives. A total of 224 surface water monitoring stations for nitrates have been reported by Slovakia under the nitrates Directive in 2008 (reference period 2004-2007). 38 surface water monitoring stations were reported under the bathing water directive (bathing season 2007). Those figures are preliminary as quality checking is on-going at the time this report is written.

2. Slovakia applies more stringent waste water treatment in the whole of its territory and therefore, in accordance to article 5.8 of the Urban Waste Water Directive 1991/271/EEC, it is exempted from designation of specific sensitive areas.

## Location of surface water and groundwater monitoring stations



## SURFACE WATER MONITORING PROGRAMMES

Design of Monitoring Programmes

In both of the river basin districts the same methodologies and standards were generally applied and an identical design was used for setting up the monitoring programmes. There are specific monitoring programmes for operational, surveillance and investigative monitoring. Operational and surveillance monitoring programmes each have two sub-programmes, one for rivers and one for lakes. In principle, the monitoring programmes take account of the WFD objectives which will provide a coherent and comprehensive overview in the future.

The criteria mentioned in the Directive for the design of the *surveillance monitoring* network have been applied. There is no explicit reference to validation of the results of the pressure and impact analysis. The assessment of long-term changes in natural conditions and the long-term changes resulting from widespread anthropogenic activity are included in the key factors used for the design of the surveillance monitoring network.

There are two specific sub-programmes for *operational monitoring* – one for rivers and one for lakes. Annual updating of the operational monitoring network is foreseen based on the

results obtained. Site selection for rivers is based on the existing monitoring network and focuses on information in the sub-basins and downstream the significant pollution sources. A specific site aggregation procedure was adopted and applied. Reservoirs for drinking water production are included in water category “lakes”.

The intended *starting date of the operational monitoring programme* is 1 January 2008 and the reason for delay is that the preliminary programme for operational monitoring is based on the pressure and impact analysis and on the results of the past monitoring programmes which were not WFD compliant. Operational monitoring still has to be adjusted to take account of the results of the surveillance monitoring in 2007.

The scope of *investigative monitoring* is described and it includes an assessment of impacts of accident pollution. The design of the future investigative monitoring will take into account the results of the surveillance monitoring in 2007.

Information is provided on *monitoring of protected areas* for drinking water abstraction, but not for monitoring of other protected areas.

Information on monitoring under *other legislative or voluntary agreements* was not provided for either of the river basin districts with the exception of the sites mentioned that are part of WISE-SoE (formerly EIONET-Water).

*International coordination* takes place in the Danube river basin district through the International Commission for the Protection of the Danube River (ICPDR). Some of the Slovak monitoring sites are part of the Transnational Monitoring Network of the ICPDR and a reference is given to the monitoring concept of the ICPDR. The Vistula river basin district is not part of any international river basin convention and no joint monitoring has been agreed in the frame of bilateral agreements with the neighbouring countries.

#### Development of Biological Assessment Methods

As regards the *development of biological assessment methods*, the reports provide a very brief description of most of the methods of sampling and analysis for some biological quality elements. Standard methods for sampling and various analytical methods are given. There is no description of assessment methods for ecological status and no reference to further information. It has been assumed that most of the methods are under development but the information is not clear on the current status of the various methods. There is no information for fish in lakes.

No information has been provided on *levels of confidence and precision*.

Summary of available biological assessment methods

	Rivers				Lakes				Transitional Waters				Coastal Waters		
	Phytoplankton	Macrophytes and Phytobenthos	Benthic invertebrates	Fish	Phytoplankton	Macrophytes and Phytobenthos	Benthic invertebrates	Fish	Phytoplankton	Macroalgae and Angiosperms	Benthic invertebrates	Fish	Phytoplankton	Macroalgae and Angiosperms	Benthic invertebrates
Slovakia	■	■	■	■	■	■	■	■	-	-	-	-	-	-	-

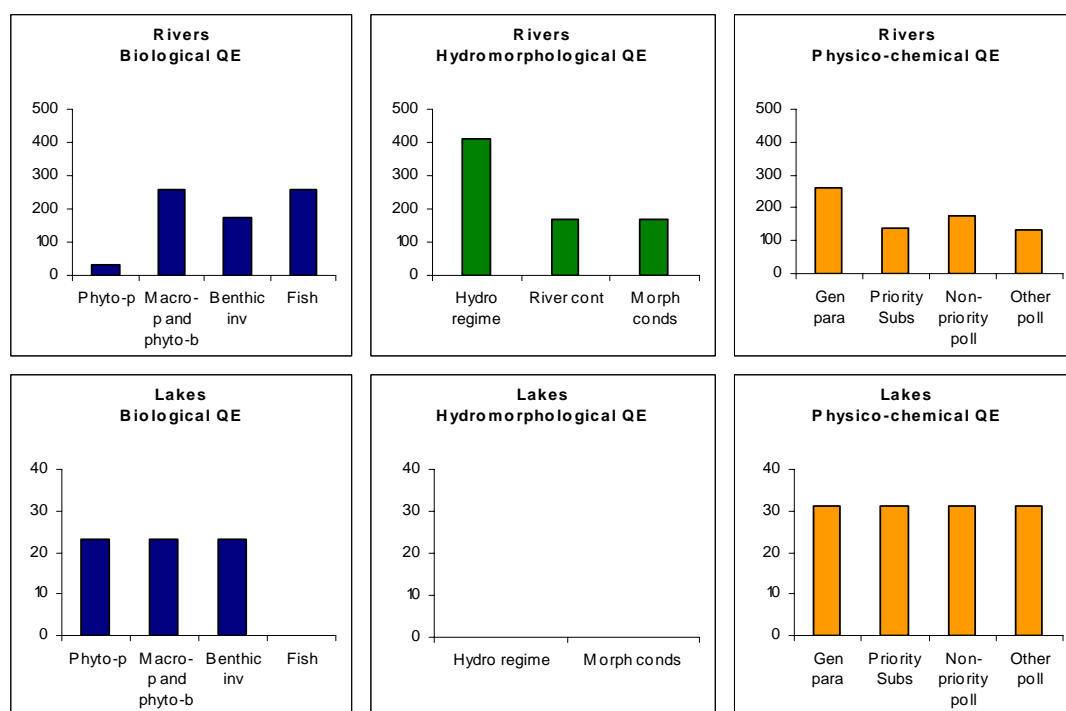
Method available ■ Under development or incomplete information ■ Not developed or no information ■ Not relevant -

Selection of Quality Elements and Frequency of Monitoring

Surveillance monitoring in rivers covers all quality elements. In lakes, no monitoring of fish and hydromorphology is included in surveillance monitoring.

Operational monitoring in rivers is based on biological, chemical, physicochemical and hydromorphological quality elements. Operational monitoring in lakes (i.e. in reservoirs for drinking water production) is based only on chemical and physicochemical quality elements.

Number of stations where quality elements are monitored (surveillance and operational monitoring) in rivers, lakes, transitional and coastal waters



With respect to *frequency*, the surveillance monitoring programmes will generally be carried out in the first year and then further monitoring decided on the basis of the results. The number of monitoring samples of the biological quality elements within the year of monitoring varies from 6 times for phytoplankton and twice for benthic invertebrates to once for other aquatic flora and fish. Fish are only monitored in rivers.

For operational monitoring biological quality elements are monitored at the WFD minimum requirement of every 3 years in rivers. The frequency of monitoring the biological quality elements within the year varies from 6 times for phytoplankton and twice for benthic invertebrates to once for other aquatic flora and fish. Priority substances are monitored every year. For lakes, operational monitoring does not include biological quality elements, only physico-chemical, priority substances and other specific pollutants.

## **GROUNDWATER MONITORING PROGRAMMES**

### Design of Monitoring Programmes

In both of the river basin districts the same identical design was used for the groundwater monitoring programmes. There are specific monitoring programmes for operational, surveillance and quantitative monitoring of groundwater which are appropriate to provide a coherent and comprehensive overview. The monitoring sites have been selected to provide the necessary information to validate the impact assessment and to assess long-term changes in quantitative and qualitative status. The criteria for surveillance monitoring of groundwater chemical status given in the Directive have been applied although they are not specifically mentioned in the reports. Groundwater monitoring will start on 1 January 2007.

There are specific sub-programmes for *groundwater level monitoring* that are designed to validate the results of the 2004 pressure and impact analysis, with appropriate monitoring density to assess impacts on abstractions and discharges on the groundwater level. About one-third of the sites have continuous measurements. The monitoring network will be upgraded by 2009.

There are specific sub-programmes for *surveillance monitoring of chemical status* that are designed to validate the results of the 2004 pressure and impact analysis. The monitoring network covers all quaternary and pre-quaternary groundwater bodies with at least one sampling site in each groundwater body.

*Operational monitoring of chemical status* will be carried out from 2007-2015. Selection of monitoring sites will be revised annually in respect to the information needs for preparation of river basin management plans. Operational monitoring will cover only those groundwater bodies identified as being at risk. The operational monitoring programme was designed as a multipurpose integrated monitoring system.

There are no monitoring sites associated with *protected drinking water abstraction areas* in the Vistula river basin district but there are a number of such stations in the Danube river basin district.

The report provides information on monitoring stations that belong to networks under the *international agreements* as the ICPDR. For the Vistula river basin district there is no mention of coordination of the monitoring programmes with the neighbouring countries. The stations report does mention which monitoring stations are part of EIONET.

Selection of Quality Elements and Frequency of Monitoring

Surveillance monitoring includes all core parameters and parameters indicative of identified pressures. There is a targeted approach for operational monitoring by selecting the critical parameters with respect to the existing pressure.

The monitoring frequency of the groundwater level monitoring is once a week for the whole 6-year planning cycle. Groundwater level and operational monitoring programmes will be carried out every year for the first cycle, while the surveillance monitoring programmes will be carried out the first year only.

**FURTHER INFORMATION**

No web links on national monitoring programmes have been provided.

**SUMMARY OF TECHNICAL ASSESSMENT: STRENGTHS AND WEAKNESSES**

- + Clear reporting of good quality
- + Clear concept for developing the monitoring programmes for groundwater following WFD requirements
- Availability of methods for the assessment of ecological status

## Member State: SLOVENIA

## INFORMATION SUPPLIED

Slovenia submitted the report through WISE in the agreed format for its two river basin districts, Danube and the Adriatic sea.

## FACTS AND FIGURES

Slovenia has a population of 2 million (Eurostat, 2007) and an area of 20,275 km<sup>2</sup>. Slovenia is situated in two international river basins: North Adriatic and Danube. There are no transitional water bodies in Slovenia.



## River basin districts and number of water bodies

River Basin District	Surface (km <sup>2</sup> )	% National territory	Number of river water bodies	Number of lake water bodies	Number of transitional water bodies	Number of coastal water bodies	Number of groundwater bodies
Danube	16422	81	121	113	-	0	18
North Adriatic	3853	19	34	3	-	6	3
<b>Slovenia</b>	<b>20275</b>	<b>100</b>	<b>155</b>	<b>14</b>	<b>-</b>	<b>6</b>	<b>21</b>

## Number of surveillance, operational and quantitative monitoring stations

River Basin District	Rivers		Lakes		Transitional waters		Coastal waters		Groundwaters		
	Surv	Op	Surv	Op	Surv	Op	Surv	Op	Surv	Op	Quant
Danube	36	172	4	12	-	-	-	-	93	29	110
North Adriatic	12	28	0	3	-	-	4	5	11	0	5
<b>Total</b>	<b>48</b>	<b>200</b>	<b>4</b>	<b>15</b>	<b>-</b>	<b>-</b>	<b>4</b>	<b>5</b>	<b>104</b>	<b>29</b>	<b>115</b>
<b>Total number of monitoring stations</b>	<b>225</b>		<b>17</b>		<b>-</b>		<b>9</b>		<b>104</b>		<b>115</b>

**Note:** Total number of monitoring stations is not necessarily the sum of surveillance and operational as there are stations that serve both purposes

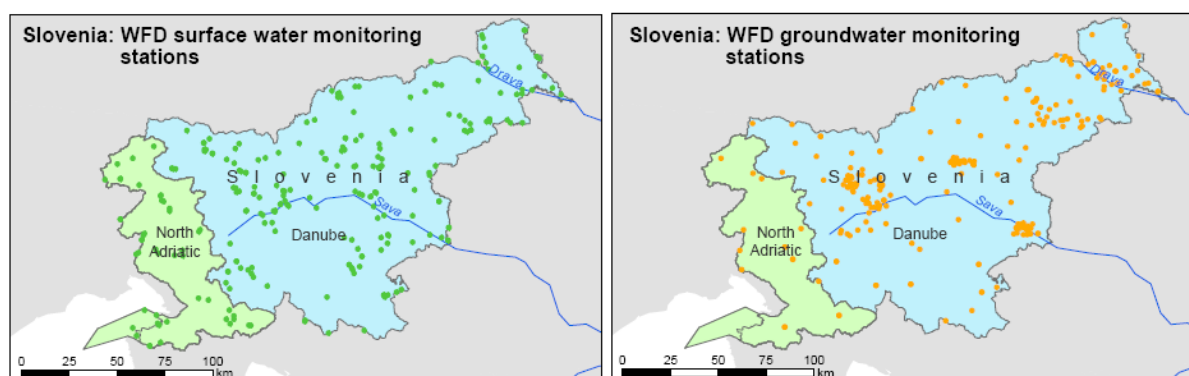
## Number of monitoring stations in protected areas reported under the WFD

River Basin District	Surface water							Ground water
	Bathing Water	Habitats / Birds	Drinking Water	Fish	Shellfish	Nitrates	Urban waste water	Drinking water
Danube						-		
North Adriatic						-		
<b>Total</b>						-		

## Notes:

1. the reporting of monitoring of protected areas under the Water Framework Directive was due only if the information was not reported under other directives. A total of 123 surface water monitoring stations for nitrates have been reported by Slovenia under the Nitrates Directive in 2008 (reference period 2004-2007). 37 surface water monitoring stations were reported under the Bathing Water Directive (bathing season 2007). Those figures are preliminary as quality checking is on-going at the time this report is written.
2. Slovenia has established and applies action programmes in the whole of its territory and therefore, in accordance to article 3.5 of the Nitrates Directive 1991/676/EEC, it is exempted from designation of specific vulnerable zones.

## Location of surface water and groundwater monitoring stations



## SURFACE WATER MONITORING PROGRAMMES

Design of Monitoring Programmes

Surveillance and operational monitoring sub-programmes have been established in for all relevant water categories in both river basin districts except surveillance monitoring for lakes in the Adriatic.

There is no clear information if any water body or monitoring site has been selected for the assessment of long-term changes in natural conditions and there is no information about monitoring of reference conditions.

The criteria for the selection of monitoring points of the WFD are taken into account in the design of the *surveillance monitoring* network.

The *operational monitoring* programme will be established for all water bodies in which priority substances are discharged and are at risk of failing to meet good status.

The report also explains in detail the criteria to locate the monitoring sites taking into account existing pressures in the water body and the objective of finding a representative location.

*Investigative monitoring* is described in the report.

No information is reported on the monitoring of protected areas.

All listed legislative and voluntary agreements are included in monitoring activity, but there is no additional explanation on their implementation. *International coordination* is expected only in a case of major accident or natural hazard – activities coordinated by special department at the Ministry of Defence according to the investigative monitoring programme.

### Development of Biological Assessment Methods

In both river basin district reports there are surveillance sub-programmes where the sampling methodology, analyses methodology and standards applied are well presented and/or described. The report states that the methods for assessment of ecological status based on fish (rivers), phytobenthos (rivers), macrophytes (lakes) and macroinvertebrates (rivers, lakes) are in progress and will be gradually implemented during the first period of monitoring. For this reason, they have been considered under development. The report states that phytoplankton in rivers is not relevant but does not provide any justification. There is no method for fish in lakes.

#### Summary of available biological assessment methods

	Rivers				Lakes				Transitional Waters				Coastal Waters		
	Phytoplankton	Macrophytes and Phytobenthos	Benthic invertebrates	Fish	Phytoplankton	Macrophytes and Phytobenthos	Benthic invertebrates	Fish	Phytoplankton	Macroalgae and Angiosperms	Benthic invertebrates	Fish	Phytoplankton	Macroalgae and Angiosperms	Benthic invertebrates
Slovenia	■	■	■	■	■	■	■	■	-	-	-	-	■	■	■

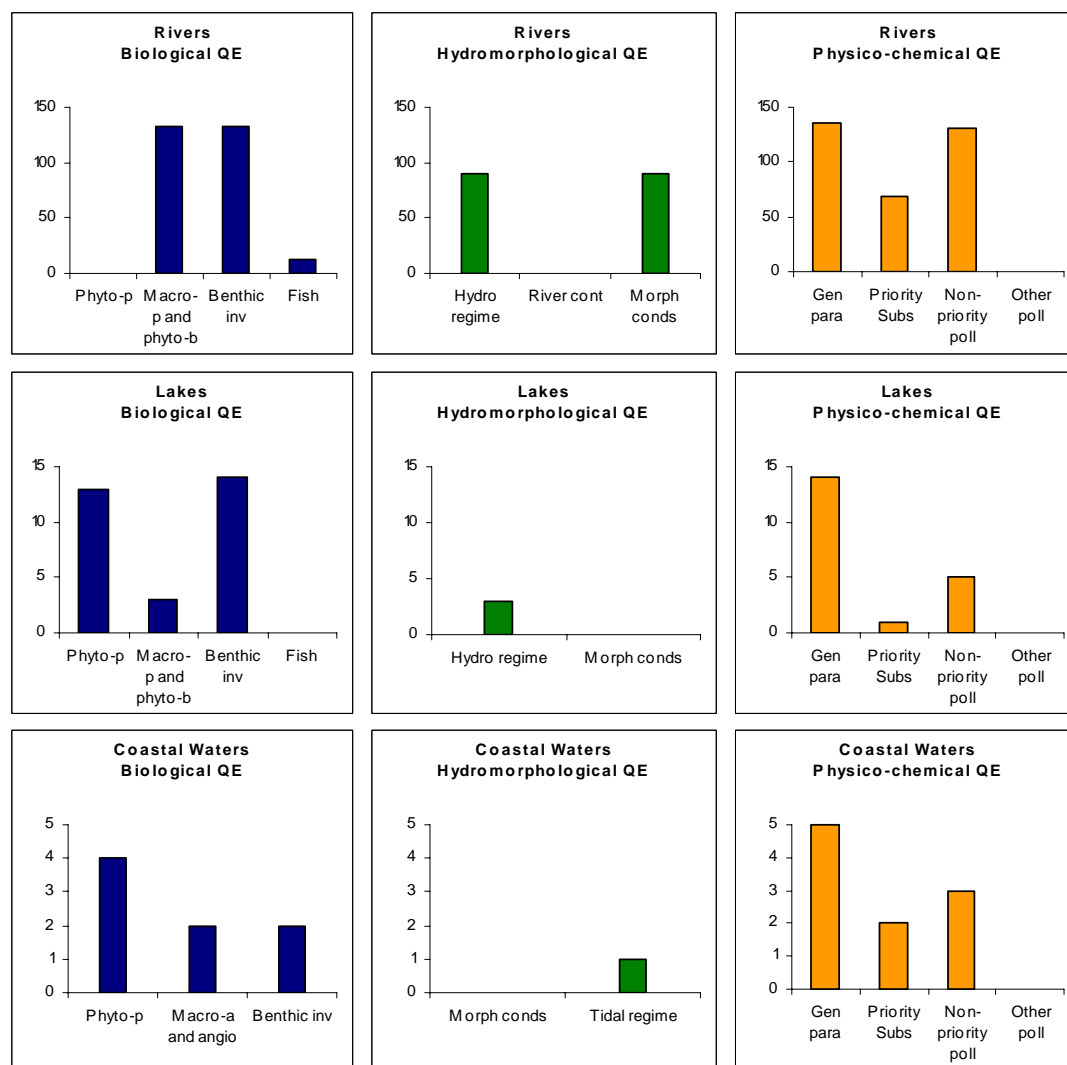
Method available ■ Under development or incomplete information ■ Not developed or no information ■ Not relevant -

**Note:** In the context of the WFD intercalibration exercise, Slovenia has intercalibrated the national assessment methods for macroinvertebrates and phytobenthos in rivers (Alpine) and macroinvertebrates and macroalgae in coastal waters. In addition, Slovenia has intercalibrated parameters indicative of biomass and taxonomic composition and abundance of phytoplankton in lakes (Alpine) and a parameter indicative of biomass of phytoplankton in coastal waters (see Commission Decision 2008/915/EC of 30 October 2008 establishing, pursuant to Directive 2000/60/EC of the European Parliament and of the Council, the values of the Member State monitoring system classifications as a result of the intercalibration exercise, available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:332:0020:0044:EN:PDF>).

### Selection of Quality Elements and Frequency of Monitoring

*Surveillance monitoring* of rivers cover all quality elements. Fish is not monitored in lakes. Priority substances and other specific pollutants are not monitored in surveillance monitoring in lakes and coastal waters of Adriatic river basin district. Other aquatic flora is not monitored in the coastal waters of Adriatic river basin district.

### Number of stations where quality elements are monitored (surveillance and operational monitoring) in rivers, lakes, transitional and coastal waters



*Frequency* of sampling depends on type of monitoring (surveillance or operational). Surveillance monitoring of biological quality elements is carried out once every 6 years. The reported monitoring cycle of biological quality elements in operational monitoring is every 3 years for some quality elements and has not been decided for others.

## GROUNDWATER MONITORING PROGRAMMES

### Design of Monitoring Programmes

In the Danube river basin district, there are specific monitoring programmes for chemical surveillance monitoring, operational monitoring and for groundwater level monitoring. In the Adriatic river basin district, there is no *operational monitoring* programme, because there is no identified groundwater body at risk.

There is evidence that the results of 2004 analysis and that the criteria of the WFD have been taken into account in the design of *surveillance monitoring* but it is not clear whether long-term trends assessment have been considered.

It is also not clear whether results of 2004 analysis and that the criteria of the WFD have been taken into account for *quantitative monitoring* programme.

There is information on the number of drinking water *protection areas* for which sampling and analysis frequencies are reported to be higher. There is no information on monitoring under any other legislative obligations different than WFD.

There is one reference to *international cooperation*, a bilateral Commission between Austria and Slovenia.

### Selection of Quality Elements and Frequency of Monitoring

Chemical surveillance monitoring covers all core and other *parameters*. For operational monitoring, selection of parameters is reported to be based on main pressures.

*Frequency*: For quantitative monitoring, groundwater level is monitored annually on a daily bases or 4 times a year.

In surveillance monitoring general parameters are monitored twice every 6 years, other parameters once every 6 years.

In operational monitoring general parameters are monitored twice every year, other parameters once every year.

### **FURTHER INFORMATION**

There is no further information provided.

### **SUMMARY OF TECHNICAL ASSESSMENT: STRENGTHS AND WEAKNESSES**

- + Quite clear report of good quality
- Availability of methods for the assessment of ecological status

**Member State: SPAIN**

**INFORMATION SUPPLIED**

Spain has reported through WISE in the agreed format for 22 river basin districts. Information for Ceuta and Melilla is missing.

**FACTS AND FIGURES**

Spain has a population of 44.5 million (Eurostat, 2007) and an area of 506,659km<sup>2</sup>. Six of the Spanish river basin districts are international: Duero, Ebro, Tagus, Guadiana, Minho and Internal Basins of Catalonia.



**River basin districts and number of water bodies**

River Basin District	Surface (km <sup>2</sup> )	% National territory	Number of river water bodies	Number of lake water bodies	Number of transitional water bodies	Number of coastal water bodies	Number of groundwater bodies
Ebro	85554	17	699	95	3	1	105
Duero	78889	16	342	17	-	-	31
Guadalquivir	57527	11	325	4	11	3	58
Tagus	55772	11	285	33	-	-	24
Guadiana	55461	11	229	32	4	2	20
Jucar	42989	8	296	20	3	43	79
Northern Spain	20826	4	291	24	23	13	36
Segura	18987	4	69	23	-	24	63
Andalusia Mediterranean	17956	4	120	5	9	26	67
Minho	17610	3	249	3	1	-	6
Catalonia Internal Basins	16494	3	260	54	21	31	39
Galician Coast	13131	3	466	-	24	123	18
Andalusia Atlantic	10743	2	113	4	20	14	17
Balearic Islands	5005	1	0	5	35	31	90
Basque internal basins	2268	0.4	48	-	14	4	14
Tenerife	2034	0.4	-	-	-	7	4
Fuerteventura	1660	0.3	-	-	-	5	4
Gran Canaria	1560	0.3	-	-	-	6	10
Lanzarote	846	0.2	-	-	-	6	1
La Palma	708	0.1	-	-	-	5	5
La Gomera	370	0.1	-	-	-	4	5
El Hierro	269	0.1	-	-	-	3	3
Ceuta	20	0.005	-	-	-	0	-
Melilla	13	0.003	-	-	-	0	-
<b>Spain</b>	<b>506659</b>	<b>100</b>	<b>3792</b>	<b>319</b>	<b>168</b>	<b>351</b>	<b>699</b>

## Numbers of surveillance, operational and quantitative monitoring stations

River Basin District	Rivers		Lakes		Transitional waters		Coastal waters		Groundwaters		
	Surv	Op	Surv	Op	Surv	Op	Surv	Op	Surv	Op	Quant
Ebro	560	177	36	19	9	5	3	1	616	188	260
Duero	192	113	17	3	-	-	-	-	343	84	381
Guadalquivir	150	34	38	7	-	-	-	-	133	62	266
Tagus	261	14	74	11	-	-	-	-	126	6	208
Guadiana	95	184	56	48	4	1	2	0	120	25	284
Jucar	142	243	6	16	15	0	473	0	219	62	283
Northern Spain	188	208	5	11	167	0	49	0	78	0	103
Segura	103	96	3	0	4	0	61	35	119	4	144
Andalucia Mediterranean	21	21	13	13	7	4	26	0	49	30	54
Minho	142	109	5	27	-	-	-	-	15	0	17
Catalonia Internal Basins	261	111	54	5	12	2	35	17	500	705	520
Galician Coast	75	29	0	0	22	2	11	12	41	0	0
Andalucia Atlantic	6	3	9	3	11	15	14	0	15	7	12
Balearic Islands	0	0	0	0	40	0	63	14	113	67	121
Basque internal basins	61	27	0	0	25	4	11	1	15	4	14
Tenerife	-	-	-	-	-	-	91	85	54	5	38
Fuerteventura	-	-	-	-	-	-	77	36	23	13	36
Gran Canaria	-	-	-	-	-	-	69	117	24	36	60
Lanzarote	-	-	-	-	-	-	66	41	1	0	1
La Palma	-	-	-	-	-	-	42	19	13	12	4
La Gomera	-	-	-	-	-	-	27	17	8	3	5
El Hierro	-	-	-	-	-	-	28	0	12	0	5
Cueta	-	-	-	-	-	-	-	-	-	-	-
Melilla	-	-	-	-	-	-	-	-	-	-	-
<b>Total</b>	<b>2257</b>	<b>1369</b>	<b>314</b>	<b>163</b>	<b>316</b>	<b>33</b>	<b>1148</b>	<b>395</b>	<b>2637</b>	<b>1313</b>	<b>2816</b>
<b>Total number of monitoring stations</b>	<b>3626</b>		<b>477</b>		<b>349</b>		<b>1543</b>		<b>3950</b>		<b>2816</b>

**Note:**

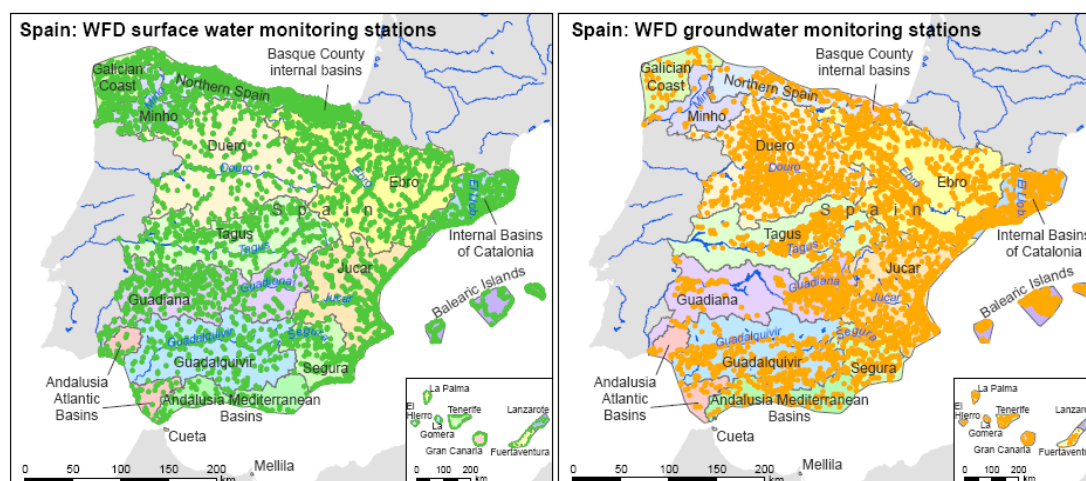
- Total number of monitoring stations is not necessarily the sum of surveillance and operational as there are stations that serve both purposes
- The numbers presented in this table differ substantially from the ones reported under article 8 by Spain in 2007, which are the ones used in the indicators and tables in the rest of this report. The numbers in the table above are higher and have been provided as a response to a consultation in January 2009.

## Number of monitoring stations in protected areas reported under the WFD

River Basin District	Surface water							Ground water
	Bathing water	Habitats / Birds	Drinking water	Fish	Shellfish	Nitrates	Urban waste water	Drinking water
Ebro	31	11	152	14		11	22	194
Duero		89	45	43	-	1	46	173
Guadalquivir			42	17		34		67
Tagus	2	112	97	10	-	33	43	40
Guadiana	7	181	57	46		96	83	70
Jucar	2	155	16	2		58	29	113
Northern Spain	7	62	94	21	16			28
Segura	37	100	8			73	4	26
Andalucia Mediterranean	3	20	14	3		5		36
Minho	2		41	9	-			0
Catalonia Internal Basins	257	189	48	67			130	
Galician Coast	18	4	10	11				
Andalucia Atlantic	3	7	6	2		4		1
Balearic Islands								76
Basque internal basins	52	24		4			15	10
Tenerife		44					7	
Fuerteventura		28					12	5
Gran Canaria		38						11
Lanzarote		22						
La Palma		13					8	2
La Gomera		8					8	6
El Hierro							9	7
Cueta								
Melilla								
<b>Total</b>	<b>421</b>	<b>1116</b>	<b>630</b>	<b>249</b>	<b>21</b>	<b>315</b>	<b>416</b>	<b>865</b>

**Note:** the reporting of monitoring of protected areas under the Water Framework Directive was due only if the information was not reported under other directives. A total of 3084 surface water monitoring stations for nitrates have been reported by Spain under the nitrates Directive in 2008 (reference period 2004-2007). 2085 surface water monitoring stations were reported under the bathing water directive (bathing season 2007). Those figures are preliminary as quality checking is on-going at the time this report is written.

## Location of surface water and groundwater monitoring stations



## SURFACE WATER MONITORING PROGRAMMES

### Design of monitoring programmes

The reporting is structured in a very uniform way for all river basin districts. The titles of the programmes and sub-programmes are similar and refer to specific objectives of the surveillance or operational monitoring, or to monitoring under other related directives or voluntary agreements. However, the information on design of the networks is very uneven and is lacking or very brief in many river basin districts, and the contents of the reports vary greatly in level of detail and in substance.

Information on the monitoring networks is lacking for the following water categories and river basin districts:

- Rivers and lakes in Balearic Islands
- Transitional in Minho
- Coastal and transitional in Guadalquivir

For *surveillance monitoring* the criteria in Annex V section 1.3.1 are not systematically mentioned as the basis for the selection of sites. The information given by the different river basin districts indicate that the network at national level is not coherent. Seven river basin districts reported to have started the monitoring programmes on 1 March 2007.

For *operational monitoring*, almost every river basin district reports sub-programmes, but there is little information given on design of the programmes. Six river basin districts reported to have started the monitoring programmes on 1 March 2008, later than the required date of 22 December 2006.

Only the Duero river basin district reported information on *investigative monitoring*, detailing two occurrences.

Most of the river basin districts designed specific sub-programmes regarding drinking water protected areas.

Only two river basin districts give links or references to information contained in other documents.

Most of the river basin districts included information on the *monitoring of protected areas* with substantial information. Typically, there is no information on *international coordination* for the design of the monitoring programmes. Only the report from the Duero river basin district refers to collaboration in the monitoring of emissions to sea and the transboundary waters programme.

#### Development of biological assessment methods

Reporting of the biological assessment methods is extremely irregular, with only a few basins providing clear information. One of these is the Duero basin that makes reference to the use of methods developed by the Ebro basin authority. However, the Ebro report does not provide any information on the methods. In general the reporting of methods is very confusing and it looks as if there are no national methods developed.

There was no information given on the levels of confidence.

Summary of available biological assessment methods

	Rivers				Lakes				Transitional Waters				Coastal Waters		
	Phytoplankton	Macrophytes and Phytobenthos	Benthic invertebrates	Fish	Phytoplankton	Macrophytes and Phytobenthos	Benthic invertebrates	Fish	Phytoplankton	Macroalgae and Angiosperms	Benthic invertebrates	Fish	Phytoplankton	Macroalgae and Angiosperms	Benthic invertebrates
Duero	■	■	■	■	■	■	■	■	-	-	-	-	-	-	-
Ebro	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Guadalquivir	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Tagus	■	■	■	■	■	■	■	■	-	-	-	-	-	-	-
Minho	■	■	■	■	■	■	■	■	■	■	■	■	-	-	-
Northern Spain	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Segura	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Andalucia Mediterranean	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Catalonia Internal Basins	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Galician Coast	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Guadiana	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Andalucia Atlantic	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Jucar	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Balearic Islands	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Basque internal basins	■	■	■	■	-	-	-	-	■	■	■	■	■	■	■
Tenerife	-	-	-	-	-	-	-	-	-	-	-	-	■	■	■
Fuerte-ventura	-	-	-	-	-	-	-	-	-	-	-	-	■	■	■
Gran Canaria	-	-	-	-	-	-	-	-	-	-	-	-	■	■	■
Lanzarote	-	-	-	-	-	-	-	-	-	-	-	-	■	■	■
La Palma	-	-	-	-	-	-	-	-	-	-	-	-	■	■	■
La Gomera	-	-	-	-	-	-	-	-	-	-	-	-	■	■	■
El Hierro	-	-	-	-	-	-	-	-	-	-	-	-	■	■	■

Method available ■ Under development or incomplete information ■ Not developed or no information ■ Not relevant -

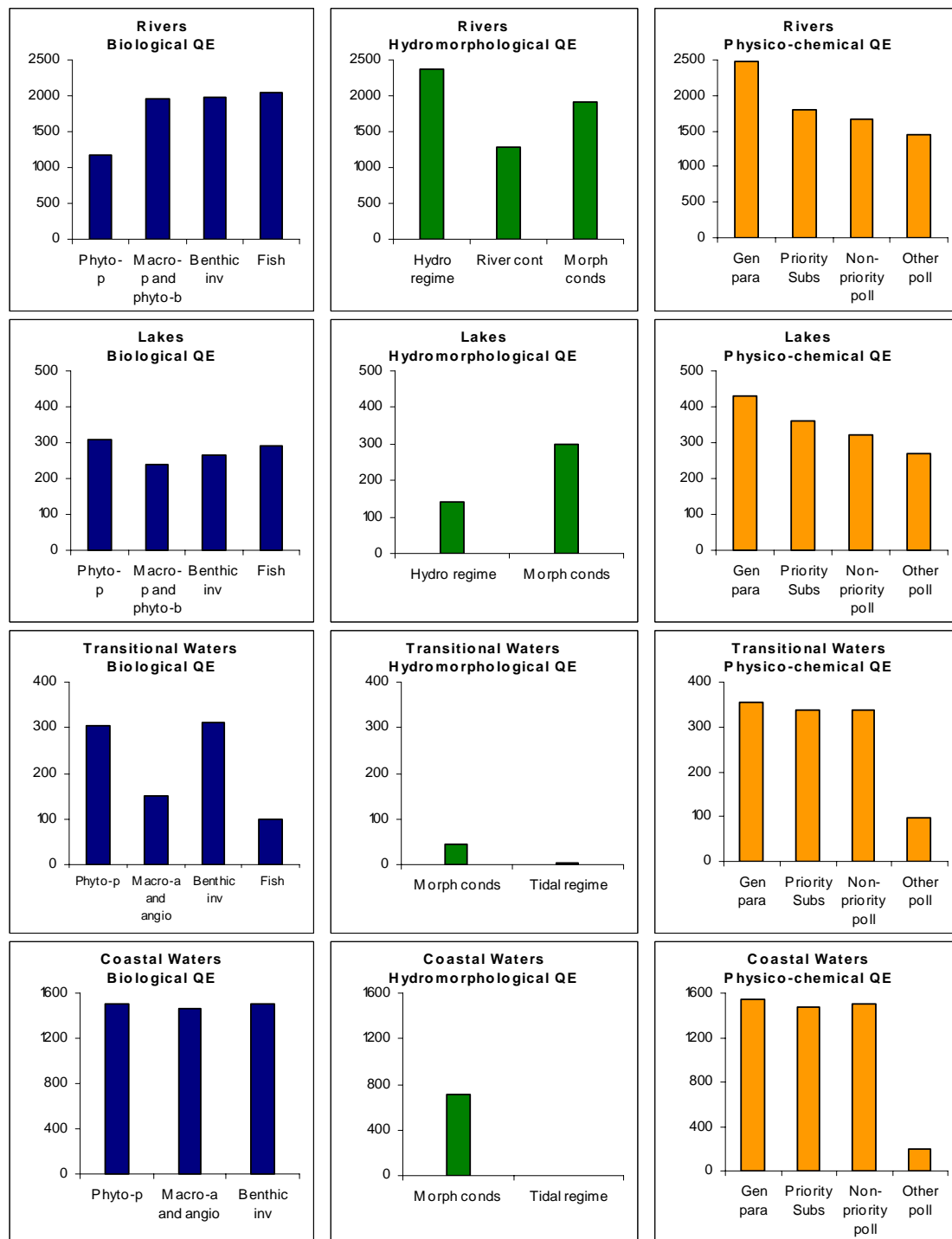
**Note:** In the context of the WFD intercalibration exercise, Spain has intercalibrated the national assessment methods for macroinvertebrates and phytobenthos in rivers (Central, Alpine and Mediterranean geographical areas), macroinvertebrates in North-East Atlantic and Mediterranean coastal waters and macroalgae in Mediterranean coastal waters. In addition, Spain has intercalibrated parameters indicative of biomass and of taxonomic composition and abundance of phytoplankton in Mediterranean reservoirs, parameters indicative of biomass of phytoplankton in coastal waters (both Mediterranean and North-East Atlantic), a parameter indicative of phytoplankton blooms in North-East Atlantic coastal waters, a parameter indicative of composition of macroalgae in North-East Atlantic and a parameter indicative of taxonomic composition of phytoplankton in Mediterranean coastal waters (see Commission Decision 2008/915/EC of 30 October 2008 establishing, pursuant to Directive 2000/60/EC of the European Parliament and of the Council, the values of the Member State monitoring system classifications as a result of the intercalibration exercise, available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:332:0020:0044:EN:PDF>).

### Selection of quality elements and frequency of monitoring

The monitoring of quality elements in *surveillance monitoring* is far from exhaustive and varies greatly among river basins. In surveillance monitoring, priority substances and other specific pollutants are missing from the monitoring programmes in the following river basin districts (for the water categories indicated in brackets): Minho (all), Norte (rivers and lakes), Jucar (lakes) and Ebro (rivers and lakes). Other specific pollutants are also missing in Guadalquivir river basin district. Biological quality elements are not monitored in rivers and lakes in both Mediterranean and Atlantic Basins of Andalucia. Phytoplakton is the only biological quality element monitored in lakes in the Segura. The reporting by the Ebro river basin district does not specify which biological quality elements are monitored in rivers and lakes. Other aquatic flora in lakes is missing in Guadalquivir and Jucar. Fish in lakes is not monitored in the Internal basins of Catalonia. Other aquatic flora and fish are not monitored in transitional waters in Guadiana and both basins of Andalucia. Biological quality elements are not monitored in transitional waters in Jucar basin. Phytoplankton and fish are not monitored in transitional waters in the Internal basins of Catalonia. Fish is missing in monitoring of transitional waters in the Baleares river basin district. Other aquatic flora is not included in surveillance monitoring of coastal waters in the Guadiana, both basins of Andalucia and Ebro. Again, it appears that there is no national approach in designing the monitoring programmes.

There is no information on the rationale for the selection of quality elements for *operational monitoring*.

**Number of stations where quality elements are monitored (surveillance and operational monitoring) in rivers, lakes, transitional and coastal waters**



The monitoring frequencies reported also vary greatly between the river basin districts, quality elements and water categories.

## GROUNDWATER

### Design of monitoring programmes

As with the surface water, reporting is structured in a very uniform way for all river basin districts, although the level of detail and the quality of the reports differ considerably across river basin districts. All river basin districts have reported to have established specific monitoring programmes for groundwater quantitative and chemical assessment including surveillance and operational. In some cases programmes for drinking water and WISE-SoE are reported. One river basin district reported to have one monitoring programme encompassing everything. In general, information provided for the design of monitoring programmes was scarce.

For *surveillance monitoring*, although most reports referred to the objectives of Annex V.2 of WFD and provisions of Directive 2006/118/EC (wrongly quoted as 2006/116/EC across almost all reports) and sometimes to the results of WFD Article 5 pressure and impact analysis, it was not explained how the results of the 2004 analysis were used and if long-term trends assessment may have been taken into account in the design of these monitoring programmes. In some cases, there was no information provided.

The reports do not identify any transboundary groundwater body.

For 5 river basin districts, there are no *operational monitoring* programmes reported despite important percentages of groundwater bodies were identified at risk or lacking sufficient information in the pressure and impact analysis of 2004. No reasons are mentioned for the absence of operational monitoring in those basins. Generally the reports state that the objective of operational monitoring programmes were the assessment of water bodies at risk and establishment of upward trends. One river basin district indicated that the operational monitoring programme would be delayed (no reason provided) until February 2007.

Information was provided in monitoring stations that are located in *protected areas* and on other networks. Although most river basin districts reported to have stations which were also used for drinking water abstraction, there were no information/comments on additional monitoring requirements.

Ten river basin districts reported specific monitoring programmes for EIONET and/or drinking water.

### Selection of quality elements and frequency of monitoring

In general, the reports indicate that monitoring will be carried out every year.

## FURTHER INFORMATION

No further information provided.

**SUMMARY OF TECHNICAL ASSESSMENT: STRENGTHS AND WEAKNESSES**

- + Well structured report to cover the objectives of WFD monitoring and protected areas
- + Information on monitoring of protected areas is provided
- Monitoring programmes missing for rivers and lakes in Baleares, transitional waters in Minho and coastal and transitional waters in Guadalquivir
- Diversity of approaches across river basin districts as regards all aspects of design and implementation (densities of monitoring stations, methods to assess ecological status, coverage of quality elements, frequencies, etc).
- Lack of information about international coordination (except in Duero river basin district)
- Availability of methods for the assessment of ecological status

**Member State: SWEDEN**

**INFORMATION SUPPLIED**

Sweden has reported through WISE in the agreed format for 9 out of 10 river basin districts. Additional reports or information has been submitted for 5 river basin districts. Three of the large Swedish river basin districts provided separate reports describing the surface water monitoring programmes, one of which also covered one of the small districts.

Sweden have designated 5 large river basin districts, located mainly on the Swedish territory (Bothnian Bay, Bothnian Sea, Northern Baltic Sea, Southern Baltic Sea and Skagerrak and Kattegat). For this report on monitoring Sweden has also indicated the existence of 5 additional small river basin districts, being those areas with rivers discharging into mainly Norwegian river basins (Glomma, South Troendelag, North Troendelag, Northland and Troms). For the purpose of this report, these river basin districts are referred to as the *large* and the *small* river basin districts respectively.

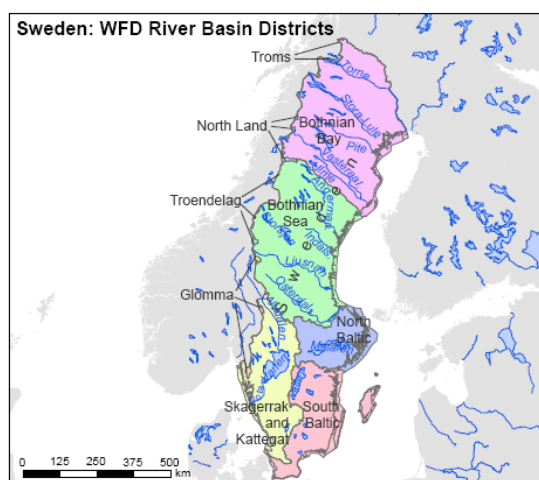
A separate report was provided on analytical methods, valid for the whole country, notably Handbook 2007:4 on quality requirements and in surface waters.

Links to further information provided to the Swedish Environmental Protection Agency (<http://www.naturvardsverket.se>), but the detailed information referred to as available on those links was not easily identified on that site.

**FACTS AND FIGURES**

Sweden has a population of 9.1 million (Eurostat, 2007) and an area of 453,140 km<sup>2</sup>.

Sweden shares seven international river basins: Bothnian Bay, Bothnian Sea, Skagerrak and Kattegat, North Land, Glomma, Troms and North Troendelag.



**River basin districts and number of water bodies**

River Basin District	Surface (km <sup>2</sup> )	% National territory	Number of river water bodies	Number of lake water bodies	Number of transitional water bodies	Number of coastal water bodies	Number of groundwater bodies
Bothnian Bay	147625	33	4931	1920	-	95	655
Bothnian Sea	141638	31	7369	3679	-	62	781
Skagerrak and Kattegat	69546	15	1679	755	2	110	477
South Baltic	54420	12	963	480	-	170	580
North Baltic	36959	8	629	338	18	135	536
North Land	1317	0.3	56	44	-	-	1
Glomma	990	0.2	32	23	-	-	2
North and South Troendelag	451	0.1	47	18	-	-	-
Troms	194	0.04	16	8	-	-	-
<b>Sweden</b>	<b>453140</b>	<b>100</b>	<b>15722</b>	<b>7265</b>	<b>20</b>	<b>572</b>	<b>3032</b>

**Note:** Northern and Southern Troendelag river basin districts are displayed together on this table

**Numbers of surveillance, operational and quantitative monitoring stations**

River Basin District	Rivers		Lakes		Transitional waters		Coastal waters		Groundwaters		
	Surv	Op	Surv	Op	Surv	Op	Surv	Op	Surv	Op	Quant
Bothnian Bay	40	81	25	0	-	-	4	13	17	0	0
Bothnian Sea	23	81	9	38	-	-	2	39	16	0	0
Skagerrak and Kattegat	35	367	28	127	1	1	31	9	28	0	0
South Baltic	43	86	41	48	-	-	1	71	38	0	0
North Baltic	93	145	238	447	1	0	75	0	16	0	0
North Land	0	0	0	0	-	-	-	-	0	0	0
Glomma	1	9	1	0	-	-	-	-	0	0	0
South Troendelag	0	0	0	0	-	-	-	-	-	-	-
Troms	0	0	0	0	-	-	-	-	-	-	-
North Troendelag	0	0	0	0	-	-	-	-	-	-	-
<b>Total</b>	<b>235</b>	<b>769</b>	<b>342</b>	<b>660</b>	<b>2</b>	<b>1</b>	<b>113</b>	<b>132</b>	<b>115</b>	<b>0</b>	<b>0</b>
<b>Total number of monitoring stations</b>	<b>1003</b>		<b>989</b>		<b>3</b>		<b>244</b>		<b>115</b>		<b>0</b>

**Note:** Total number of monitoring stations is not necessarily the sum of surveillance and operational as there are stations that serve both purposes

**Number of monitoring stations in protected areas reported under the WFD**

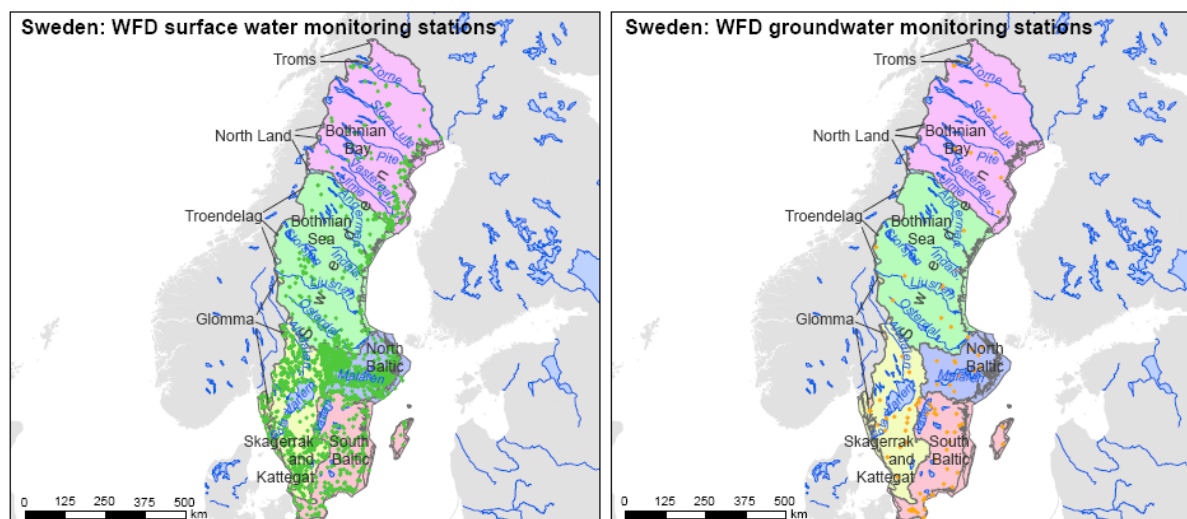
River Basin District	Surface water							Ground water
	Bathing Water	Habitats / Birds	Drinking Water	Fish	Shellfish	Nitrates	Urban waste water	Drinking Water
Bothnian Bay							-	6
Bothnian Sea							-	7
Skagerrak and Kattegat							-	4
South Baltic							-	5
North Baltic							-	4
North Land							-	
Glomma							-	
South Troendelag							-	
Troms							-	
North Troendelag							-	
<b>Total</b>							-	<b>28</b>

**Notes:**

1. The reporting of monitoring of protected areas under the Water Framework Directive was due only if the information was not reported under other directives. A total of 2417 surface water monitoring stations for nitrates have been reported by Sweden under the nitrates Directive in 2008 (reference period 2004-2007). 470 surface water monitoring stations were reported under the bathing water directive (bathing season 2007). Those figures are preliminary as quality checking is on-going at the time this report is written.

2. Sweden applies more stringent waste water treatment in the whole of its territory and therefore, in accordance to article 5.8 of the Urban Waste Water Directive 1991/271/EEC, it is exempted from designation of specific sensitive areas.

**Location of surface water and groundwater monitoring stations**



**SURFACE WATER MONITORING PROGRAMMES**

Design of Monitoring Programmes

The programmes for the five large river basin districts are fairly uniform and transparent, with separate sub-programmes reported for both *surveillance and operational monitoring* programmes. The results of the pressures and impact analysis of Swedish water bodies were

however not ready for use by the river basin authorities when the WFD monitoring programmes were designed. Thus the river basin authorities could not design their monitoring programmes to supplement and validate the results from the pressure and impact analyses. It is reported that the monitoring network is in construction and will undergo changes in the next few years. The issue of allocating financial resources was also reported to be unsolved. The programmes reported represent a minimum level, and are mainly a subset of the existing national programmes.

The four reports submitted for the small river basin districts included only limited information, to the extent that it is concluded that no surface water monitoring programmes are established in practice in these districts.

For *surveillance monitoring* one stated general objective is to assess long-term trends in natural conditions, but the report does not specify how this is implemented in practice in the design (for example, no monitoring of reference sites were reported). Some of the criteria for selecting sites (flow, volume, indicative of pollution) are mentioned in the handbook for lakes and rivers.

In all river basin districts except for one (Skagerrak and Kattegat, including Glomma), *investigative monitoring* is referred to briefly.

The reports for the five large river basin districts and Glomma provide some information on *monitoring of protected areas*, but no information on monitoring stations located in protected areas was given. Most of the river basin district reports refer to *drinking water* abstraction points within the river basin districts, and state that there are monitoring stations for drinking water abstraction sites in the river basin district. However, it is not clear if any of the sites are included in the list of reported stations.

For three of the five large river basin districts the report mentions the number of sites or water bodies where monitoring under some of the *other water directives* is operated.

Two of the three main international river basin districts established *international collaboration* (Bothnian Bay, Skagerrak and Kattegat) in design of the monitoring networks with Norway.

#### Development of Biological Assessment Methods

All sampling, analyses and assessment methods are reported to be available except phytoplankton in rivers, which is not used (see Handbook no. 4 from Naturvårdsverket). The reported material contains references to methodological documents or standards in use.

No information is provided on *confidence level* for the current monitoring design, but the reports suggest that such an analysis will be made later.

Summary of available biological assessment methods

	Rivers				Lakes				Transitional Waters				Coastal Waters		
	Phytoplankton	Macrophytes and Phytobenthos	Benthic invertebrates	Fish	Phytoplankton	Macrophytes and Phytobenthos	Benthic invertebrates	Fish	Phytoplankton	Macroalgae and Angiosperms	Benthic invertebrates	Fish	Phytoplankton	Macroalgae and Angiosperms	Benthic invertebrates
Sweden	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

Method available ■ Under development or incomplete information ■ Not developed or no information ■ Not relevant -

**Note:** In the context of the WFD intercalibration exercise, Sweden has intercalibrated a range of national methods and parameters for the assessment of ecological status (see Commission Decision 2008/915/EC of 30 October 2008 establishing, pursuant to Directive 2000/60/EC of the European Parliament and of the Council, the values of the Member State monitoring system classifications as a result of the intercalibration exercise, available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:332:0020:0044:EN:PDF>).

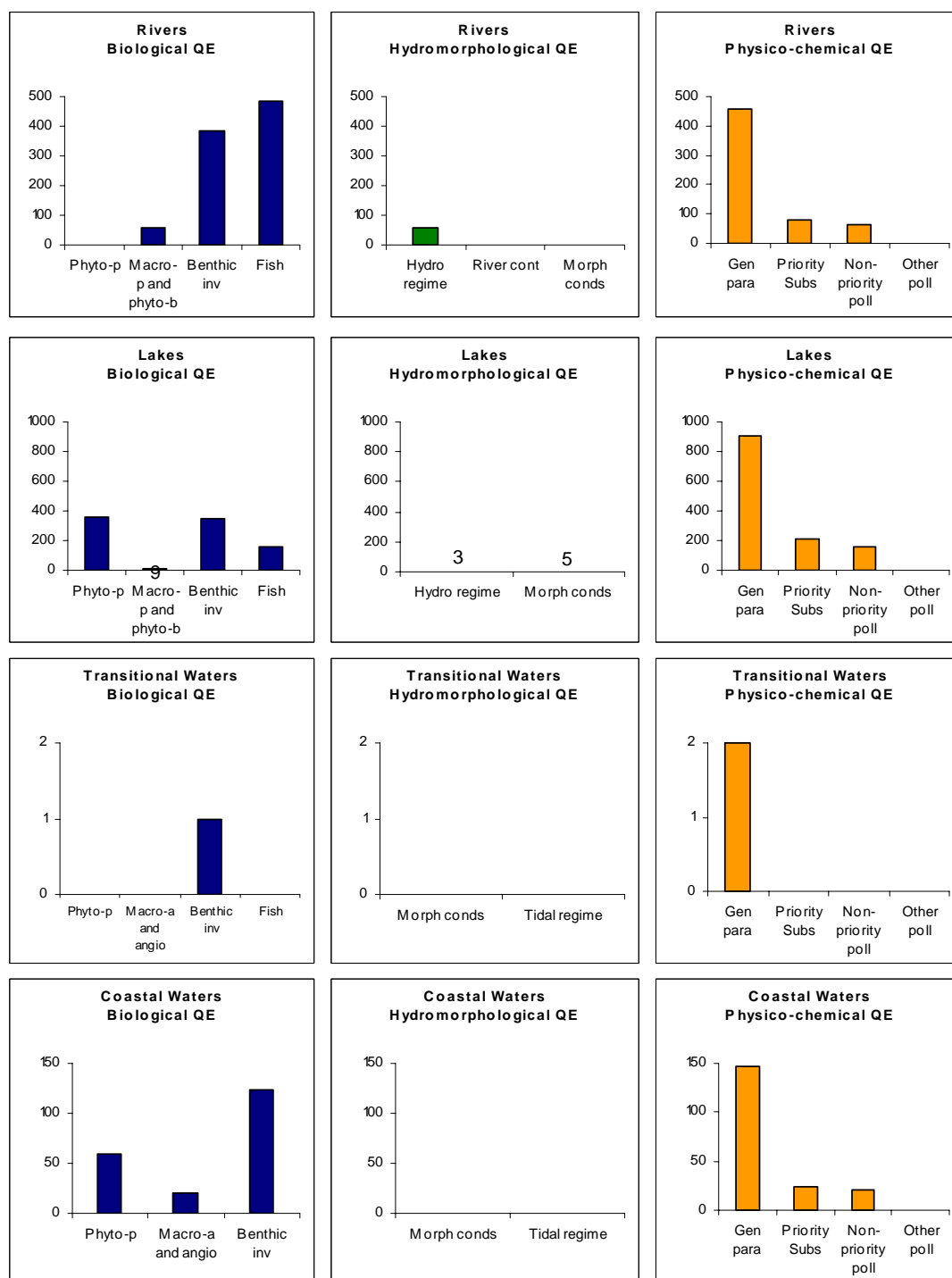
Selection of Quality Elements and Frequency of Monitoring

The coverage of quality elements in surveillance monitoring is not comprehensive and varies greatly across river basin districts. Phytoplankton in rivers is not monitored. Priority substances are not included in surveillance monitoring in rivers in the Bothnian Sea and Bothnian Bay river basin districts. In lakes, other aquatic flora is not included in surveillance monitoring in Bothnian Sea, Bothnian Bay and Skagerrak and Kattegat river basin districts. Hydromorphology in lakes is only monitored in the North Baltic river basin district. In transitional waters, only general physico-chemical pollutants are monitored in one site in the North Baltic river basin district, and only macroinvertebrates in another site in the Skagerrak and Kattegat. In coastal waters, other aquatic flora is only monitored in the Skagerrak and Kattegat. Only Phytoplankton is monitored in the coastal waters of South Baltic. Hydromorphology, priority substances and other specific pollutants are not monitored in coastal waters.

In operational monitoring, a wide range of quality elements are used, suggesting a targeted approach to pressures.

All of the river basin districts report generally mentions that there will be yearly *surveillance monitoring and operational monitoring* in the first cycle, but the yearly frequency of samples varies between quality elements and river basin districts. Phytoplankton in coastal waters is monitored from 6-25 times per year, and in lakes from 4-12 times per year. Higher frequency is used for operational than for surveillance monitoring for lakes.

**Number of stations where quality elements are monitored (surveillance and operational monitoring) in rivers, lakes, transitional and coastal waters**



**GROUNDWATER MONITORING PROGRAMMES**

Design of Monitoring Programmes

The results of the risk analysis were not available at the time of reporting therefore they could not have been taken into account in the design of monitoring programmes. The report

submitted for the small river basin districts that have groundwater bodies contain no information on groundwater monitoring. The information provided is very general and in many places insufficient to draw a proper assessment.

The information for the large river basin districts is limited to general description of methodology for quantitative and surveillance monitoring and number of stations for *surveillance monitoring*.

Although the reports indicate that there are groundwater monitoring programmes for quantitative assessment, there are no stations associated to them.

Chemical surveillance monitoring of groundwater in all five large river basin districts is reported. It is not clear if long term changes have been taken into account in the design of such a programme.

*Operational monitoring* has not yet been established, but it is indicated that it will be set up once the surveillance monitoring has identified ground water bodies at risk.

The number of *protected drinking water abstraction areas* is provided and no additional monitoring requirements are reported to be necessary. It is however not clearly reported if a particular station is used for drinking water monitoring. The reports do not provide any information on other obligations.

It is indicated that Sweden has no *transboundary ground water* bodies.

The reports are incomplete especially regarding operational monitoring and the quantitative assessment.

### Selection of Quality Elements and Frequency of Monitoring

For surveillance monitoring, the programmes are not comprehensive and cover only some of the core *parameters*. No operational and no quantitative monitoring yet established.

The indicated cycle and *frequency* for surveillance monitoring varies across river basin districts and across stations and/or quality elements. It varies between once every 6 years, once every year, twice a year, to 4 times a year every year.

### **FURTHER INFORMATION**

*Handbok 2007:4 Status, potential och kvalitetskrav för sjöar, vattendrag, kustvatten och vatten i övergångszon – En handbok om hur kvalitetskrav i ytvattensförekomster kan bestämmas och följas upp. (Handbook 2007:4 Status potential and quality objectives for lakes, rivers, coastal waters and transitional waters – A handbook on how quality objectives in surface waters can be determined and followed-up)* Available at: [www.naturvardsverket.se](http://www.naturvardsverket.se)  
Links to further information provided to the Swedish EPA (<http://www.naturvardsverket.se/sv/Nedre-meny/Webbokhandeln/ISBN/0100/978-91-620-0147-6/>).

*Övervakningsprogram för yt- och grundvatten i Bottenvikens vattendistrikt 2007-2009, Vattenmyndigheten Bottenviken.*

*Övervakningsprogram för grund- och ytvatten i Södra Östersjöns vattendistrikt enligt förordningen om förvaltning av kvaliteten på vattenmiljön (SFS 2004:660)*

*Övervakningsprogram för yt- och grundvatten i Västerhavets vattendistrikt 2007-2009*

*Information on monitoring stations for waters used for drinking water abstraction, from the Food Safety Agency (Livsmedelsverket), entitled: Livsmedelverkets föreskrifter om dricksvatten, SLVFS 2001:30. ( [http://www.slv.se/upload/dokument/Lagstiftning/2000-2005/2001\\_30.pdf](http://www.slv.se/upload/dokument/Lagstiftning/2000-2005/2001_30.pdf) )*

#### **SUMMARY OF TECHNICAL ASSESSMENT: STRENGTHS AND WEAKNESSES**

- + Good development of methods for the assessment of ecological status
- Groundwater quantitative and operational monitoring missing
- Important delay in the overall WFD implementation creates uncertainties on the effective design of the monitoring programmes (the risk assessment was not available at the time of development)
- Low density of monitoring stations in surface waters (although frequencies are higher than the minimum required in the WFD) and very low in groundwaters (lowest in EU)
- The WFD monitoring programmes appear to be a sub-set of national monitoring programmes, showing lack of integration (e.g. little information reported on monitoring of protected areas)

**Member State: UNITED KINGDOM**

**INFORMATION SUPPLIED**

The United Kingdom has reported through WISE in the agreed format for its 17 river basin districts in England and Wales, Scotland, Northern Ireland and Gibraltar. Additional information on the monitoring programmes was submitted in other formats through WISE for the following river basin districts: Neagh Bann, North Western, North Eastern, and Gibraltar.

The following reports were provided:

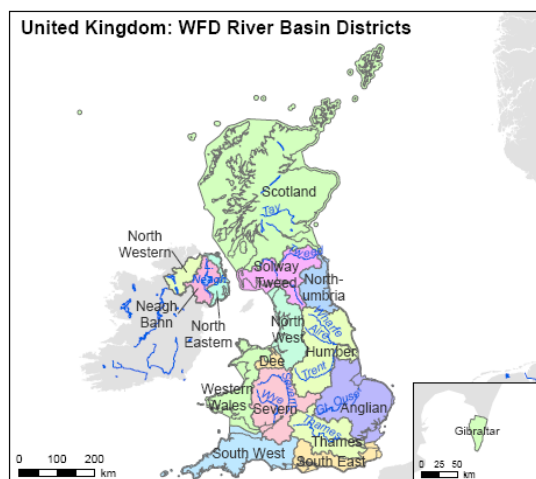
- United Kingdom Technical Advisory Group (UKTAG): guidance on the Selection of Monitoring Sites and Building Monitoring Networks for Surface Waters and Groundwater
- Scottish Environment Protection Agency (SEPA): Water Framework Directive aquatic monitoring strategy documents and
- Approach to Groundwater Monitoring for Northern Ireland, United Kingdom to meet the requirements of the Water Framework Directive'.

The Scottish report provided a link to a general overview report. No active links were provided to sources for England and Wales, and Northern Ireland.

**FACTS AND FIGURES**

The United Kingdom has a population of 60.8 million (Eurostat, 2007) and an area of 315,516 km<sup>2</sup>.

The United Kingdom shares three international river basin districts with the Republic of Ireland: Neagh Bann, North Western and Shannon.



## UNITED KINGDOM

### River basin districts and number of water bodies

River Basin District	Surface (km <sup>2</sup> )	% National territory	Number of river water bodies	Number of lake water bodies	Number of transitional water bodies	Number of coastal water bodies	Number of groundwater bodies
Scotland	113920	36	2009	309	40	449	275
Humber	29109	9	889	134	8	1	50
Anglian	27890	9	738	46	18	13	31
Severn	21590	7	744	71	6	-	40
South West	21244	7	924	60	23	28	44
Solway Tweed	17500	6	518	35	2	8	73
Western Wales	16653	5	669	62	27	24	25
Thames	16133	5	448	72	11	3	46
North West	13140	4	485	157	12	8	18
South East	10195	3	336	30	20	14	30
Northumbria	9029	3	363	73	7	7	9
Neagh Bann	6285	2	249	11	2	3	14
North Western	5497	2	192	15	2	1	45
North Eastern	5048	2	111	3	3	16	8
Dee	2251	1	86	21	1	-	6
Gibraltar	30	0.01	-	-	-	3	2
Shannon	2	0.0006	-	-	-	-	-
<b>United Kingdom</b>	<b>315516</b>	<b>100</b>	<b>8761</b>	<b>1099</b>	<b>182</b>	<b>578</b>	<b>716</b>

**Note:** number of water bodies differ from those presented in the draft river basin management plans due to splitting.

### Numbers of surveillance, operational and quantitative monitoring stations

River Basin District	Rivers		Lakes		Transitional waters		Coastal waters		Groundwaters		
	Surv	Op	Surv	Op	Surv	Op	Surv	Op	Surv	Op	Quant
Scotland	341	1118	41	106	49	153	207	374	192	162	24
Humber	128	1807	2	4	2	1	1	0	492	492	199
Anglian	95	858	3	16	3	15	2	5	451	451	170
Severn	97	1374	3	3	1	1	-	-	376	376	123
South West	138	802	3	4	6	16	7	16	408	408	78
Solway Tweed	95	378	6	24	5	21	17	27	164	158	30
Western Wales	93	757	14	13	5	9	6	12	133	133	24
Thames	109	854	1	14	1	3	1	3	602	602	284
North West	75	901	15	7	3	6	1	4	364	364	88
South East	60	436	1	21	2	8	4	11	256	256	206
Northumbria	70	356	3	0	1	4	3	4	145	145	15
Neagh Bann	30	289	7	17	19	0	26	0	21	16	9
North Western	52	286	4	20	13	12	12	7	13	0	9
North Eastern	19	148	1	2	20	0	96	0	11	20	10
Dee	21	141	2	0	1	1	-	-	37	37	10
Gibraltar	-	-	-	-	-	-	4	0	8	5	10
Shannon	-	-	-	-	-	-	-	-	-	-	-
<b>Total</b>	<b>1423</b>	<b>10505</b>	<b>106</b>	<b>251</b>	<b>131</b>	<b>250</b>	<b>387</b>	<b>463</b>	<b>3673</b>	<b>3625</b>	<b>1289</b>
<b>Total number of monitoring stations</b>	<b>11372</b>		<b>314</b>		<b>316</b>		<b>709</b>		<b>3698</b>		<b>1289</b>

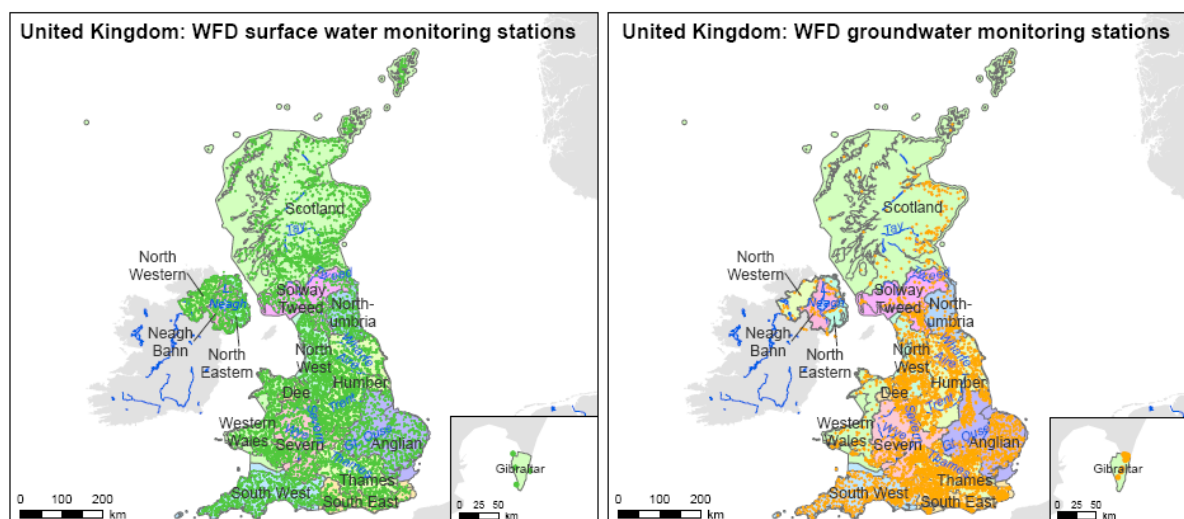
**Note:** Total number of monitoring stations is not necessarily the sum of surveillance and operational as there are stations that serve both purposes

Number of monitoring stations in protected areas reported under the WFD

River Basin District	Surface water							Ground water
	Bathing Water	Habitats / Birds	Drinking Water	Fish	Shellfish	Nitrates	Urban waste water	Drinking Water
Scotland	198	1375		991	277	331	281	
Humber								
Anglian								
Severn								
South West								
Solway Tweed	27	184		218	35	61	38	
Western Wales								
Thames			10					
North West								
South East			16					
Northumbria								
Neagh Bann		1		230	9	311	290	
North Western				259	10	306	271	
North Eastern				91	14	150	96	
Dee								
Gibraltar								3
Shannon								
<b>Total</b>	<b>225</b>	<b>1560</b>	<b>9</b>	<b>1792</b>	<b>345</b>	<b>1186</b>	<b>989</b>	<b>3</b>

**Note:** the reporting of monitoring of protected areas under the Water Framework Directive was due only if the information was not reported under other directives. A total of 9341 surface water monitoring stations for nitrates have been reported by the UK under the nitrates Directive in 2008 (reference period 2004-2007). 608 surface water monitoring stations were reported under the bathing water directive (bathing season 2007). Those figures are preliminary as quality checking is on-going at the time this report is written.

Location of surface water and groundwater monitoring stations



## SURFACE WATER MONITORING PROGRAMMES

### Design of Monitoring Programmes

Different approaches have been taken in the 3 main regions of the United Kingdom: Scotland, Northern Ireland, and England and Wales. For the Solway Tweed river basin district which is shared by Scotland and England separate approaches have been taken for the Scottish and for the English parts of the river basin district.

Scotland has separate programmes for *surveillance* and operational monitoring and for each of the four water categories (eight subprogrammes in total). In England and Wales subprogrammes have been defined based on a combination of water category and quality elements rather than programme type (operational or surveillance). This approach has resulted in ca. 600 subprogrammes. In Northern Ireland there are surveillance monitoring programmes for all water categories with a series of subprogrammes specified in terms of purpose, quality element or specific locations.

*Operational monitoring* in Northern Ireland tends to be associated with existing monitoring for specific purposes such as for OSPAR or the Nitrates Directive.

In terms of *investigative monitoring* no information was provided for Scotland and Northern Ireland whereas the strategy for investigative monitoring was described for England and Wales.

Monitoring of *protected areas* is incorporated in subprogrammes in Northern Ireland and also monitored in Scotland but no information was provided on monitoring of protected areas for England and Wales.

Little information on *international co-ordination* was provided in the Article 8 reports.

### Development of Biological Assessment Methods

For Scotland, and England and Wales the methods for some quality elements are missing or reported to be under development, for example macrophytes in rivers. No method was reported for fish in Scotland, and a method for phytoplankton in lakes in England and Wales is under development. Methods for the monitoring of angiosperms in coastal and transitional waters were missing for Scotland and England and Wales. Morphological methods for lakes in Scotland and England and Wales are also under development. The reports of Northern Ireland river basin districts state that phytoplankton is not relevant in their rivers due to short retention time<sup>2</sup>.

Information on the *levels of confidence and precision* was incomplete in all reports.

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<sup>2</sup> This may be also the case in other parts of the UK, but this was not mentioned in the report.

Summary of available biological assessment methods

	Rivers				Lakes				Transitional Waters				Coastal Waters		
	Phytoplankton	Macrophytes and Phytobenthos	Benthic invertebrates	Fish	Phytoplankton	Macrophytes and Phytobenthos	Benthic invertebrates	Fish	Phytoplankton	Macroalgae and Angiosperms	Benthic invertebrates	Fish	Phytoplankton	Macroalgae and Angiosperms	Benthic invertebrates
Scotland	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Humber	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Anglian	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Severn	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
South West	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Solway Tweed	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Western Wales	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Thames	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
North West	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
South East	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Northumbria	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Neagh Bann	-	■	■	■	■	■	■	■	■	■	■	■	■	■	■
North Western	-	■	■	■	■	■	■	■	■	■	■	■	■	■	■
North Eastern	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Dee	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Gibraltar	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Shannon	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Method available ■ Under development or incomplete information ■ Not developed or no information ■ Not relevant -

**Note:** In the context of the WFD intercalibration exercise, UK has intercalibrated a range of national methods and parameters for the assessment of ecological status (see Commission Decision 2008/915/EC of 30 October 2008 establishing, pursuant to Directive 2000/60/EC of the European Parliament and of the Council, the values of the Member State monitoring system classifications as a result of the intercalibration exercise, available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:332:0020:0044:EN:PDF>).

Selection of Quality Elements and Frequency of Monitoring

The level of reporting quality elements was variable between regions. In some cases monitoring of biological quality elements as a whole without distinction of individual organisms groups was reported while in others - monitoring at the biological quality element level was reported.

Surveillance monitoring in rivers includes all quality elements except fish in Scotland river basin district. Fish in lakes is also not monitored in Scotland. Phytoplankton, priority substances and other specific pollutants are only monitored in lakes in the river basin districts of Northern Ireland, Scotland and Solway Tweed. In transitional waters all quality elements are monitored except phytoplankton in North Western and other aquatic flora and hydromorphology in Scotland. In coastal waters all quality elements are monitored except

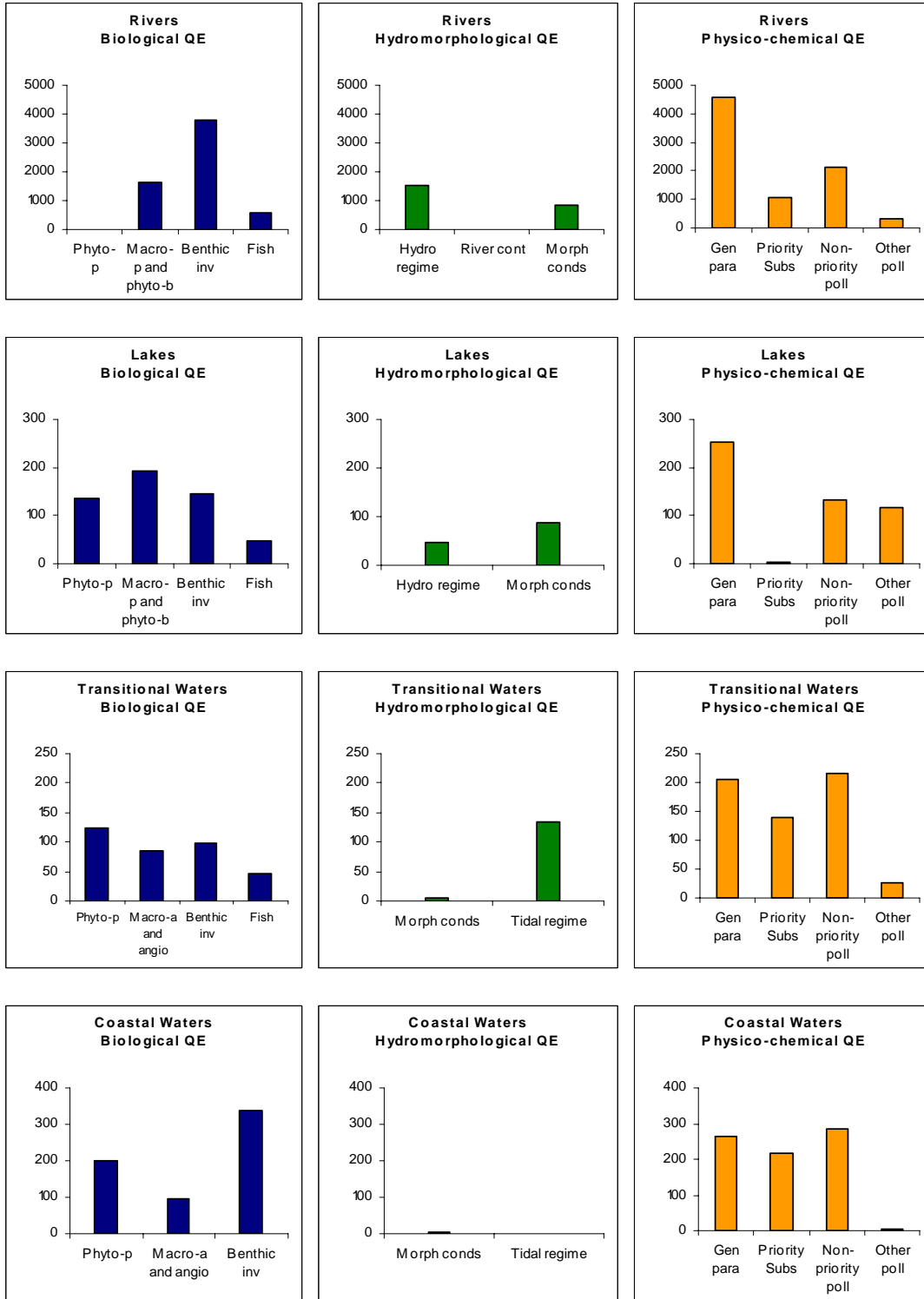
hydromorphology in Neagh Bann, hydromorphology and general physico-chemical parameters in North Western, hydromorphology and other aquatic flora in Scotland and Solway Tweed.

The reports for Scotland and England and Wales indicate that biological quality elements are focused to particular pressures within *operational monitoring*. The information from Northern Ireland was not clear.

A higher frequency than the minimum for *surveillance monitoring* is reported for all quality elements and water categories in Northern Ireland – 3 times a year. In Scotland the predominant frequency was once a year with no less frequency than once in 2 years. In England and Wales there were many differences between quality elements and water categories but with most having a greater frequency than once in 6 years.

The frequency of monitoring the biological quality elements for operational monitoring varies across regions. For England and Wales it was not possible to determine whether monitoring frequency varied between operational and surveillance monitoring since all subprogrammes are used for both purposes.

**Number of stations where quality elements are monitored (surveillance and operational monitoring) in rivers, lakes, transitional and coastal waters**



**GROUNDWATER MONITORING PROGRAMMES**

Design of Monitoring Programmes

Although all reports refer or mention the UK technical guidance for monitoring, different approaches have been adopted across the regions of the UK (Scotland, Northern Ireland and

England and Wales) and to some extent by Gibraltar. This is most evident in the Solway Tweed river basin district which is shared between Scotland and England.

In England and Wales two programmes have been defined for groundwater; one on *level of groundwater* and one on *quality of groundwater* which covers both *operational* and *surveillance monitoring*.

Gibraltar has also two programmes: one on groundwater level and one on quality. It has subdivided these programmes per each of the 2 groundwater bodies. The difference between the two groundwater bodies quality programmes is that there is no operational monitoring for the Southern Quality groundwater body monitoring programme.

In Scotland, there are two separate programmes for the surveillance and operational monitoring, both including quantitative monitoring with the majority of ground water monitoring sites being part of both the surveillance and operational networks. In Scotland it is specifically reported that the bulk of the monitoring work is operational monitoring, targeted on water bodies at risk.

In Northern Ireland there are three programmes covering groundwater; surveillance, operational and quantitative monitoring. In Northern Ireland, monitoring is also reported to be focussing on groundwater bodies 'at risk' but also allows confirmation of risk assessments and detection of sustained and significant trends in 'not at risk' bodies.

Monitoring sites were selected with the aim of achieving a representative network and meeting the quality criteria set out in EU monitoring guidance.

All networks are designed by revising and building on the existing networks. In England and Wales, the existing ground water monitoring network is however more developed than in the other regions as England and Wales has historically relied more on ground water for public water supply. It is thus reported that in Scotland and Northern Ireland, the availability of suitable ground water abstraction boreholes is limited and that new purpose built monitoring sites will have to be drilled during the first River Basin Management Plan period.

All reports mention that additional monitoring requirements for protected areas have also been considered. However this only covers monitoring of *Drinking Water Protected Areas*. The situation is however not the same across the different regions with England and Wales relying more on groundwater aquifers for drinking water supply and thus all the groundwater bodies are reported to be Drinking Water Protected Areas while in Northern Ireland and Scotland, the public water supply from groundwater has historically been low.

In England and Wales, it is reported that all parameters relevant to Drinking Water Protected Areas objectives should be included in the quality monitoring programmes. In Scotland, it is reported that monitoring of other EU directives, European EIONET etc have all been incorporated into the new Water Framework Directive network. There is however no details provided. In Northern Ireland, it is intended that a representative selection of significant drinking water sources will be sampled at least once in six years as the minimum requirement of Water Framework Directive. A proportion of such sites will also be represented within the surveillance/operational networks.

In Scotland, operational monitoring will be undertaken where surface water interactions are significant.

In Northern Ireland, it is reported that there has been and there is ongoing *co-operation* between relevant organisations in Northern Ireland and the Republic of Ireland with respect to agreeing cross-border groundwater body boundary delineation and risk assessment. Information on proposed monitoring networks has been exchanged and co-operation with regard to sampling frequency and monitoring parameters selection is planned. Data from all relevant monitoring points will be shared between the two Member States.

### Selection of Quality Elements and Frequency of Monitoring

Relevant core parameters are reported to be monitored in all river basin districts and for operational monitoring additional risk-based parameters are also reported to be monitored.

A higher frequency than the minimum is reported for all monitoring programmes. In Scotland, England and Wales and Gibraltar the cycle for every programme was once a year while in Northern Ireland the cycle for quantitative and operational monitoring was 3 times a year and for surveillance monitoring it is not yet decided.

### **FURTHER INFORMATION**

<http://www.sepa.org.uk/wfd/monitoring/index.htm>

[http://www.wfduk.org/tag\\_guidance/](http://www.wfduk.org/tag_guidance/)

[http://www.ehsni.gov.uk/water/wfd/themes/mon\\_class.htm](http://www.ehsni.gov.uk/water/wfd/themes/mon_class.htm)

### **SUMMARY OF TECHNICAL ASSESSMENT: STRENGTHS AND WEAKNESSES**

- + High density of surface water monitoring stations (highest reported in EU)
- + Monitoring of protected areas integrated in WFD programmes in Scotland
- No reporting of monitoring of protected areas in England and Wales
- Very complex reporting for England and Wales, with many sub-programmes