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Second River Basin Management Plans - Member State: Spain

Accompanying the document

REPORT FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT AND THE COUNCIL

on the implementation of the Water Framework Directive (2000/60/EC) and the Floods Directive (2007/60/EC)
Second River Basin Management Plans
First Flood Risk Management Plans

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{SWD(2019) 75 final} - {SWD(2019) 76 final} - {SWD(2019) 77 final} -
{SWD(2019) 78 final} - {SWD(2019) 79 final} - {SWD(2019) 80 final} -

Table of contents

Acronyms and definitions

EQS Directive	Environmental Quality Standards Directive
FD	Floods Directive
Km	Kilometre
km^2	Kilometre squared
KTM	Key Type of Measure
PoM	Programme of Measures
QA/QC Directive	Quality Assurance / Quality Control Directive
RBD	River Basin District
RBMP	River Basin Management Plan
WFD	Water Framework Directive
WISE	Water Information System for Europe
Annex 0	Member States reported the structured information on the second RBMPs to WISE (Water Information System for Europe). Due to the late availability of the reporting guidance, Member States could include in the reporting an Annex 0, consisting of a short explanatory note identifying what information they were unable to report and the reasons why. This Annex was produced using a template included in the reporting guidance. If Member States reported all the required information, this explanatory note was not necessary.

Foreword

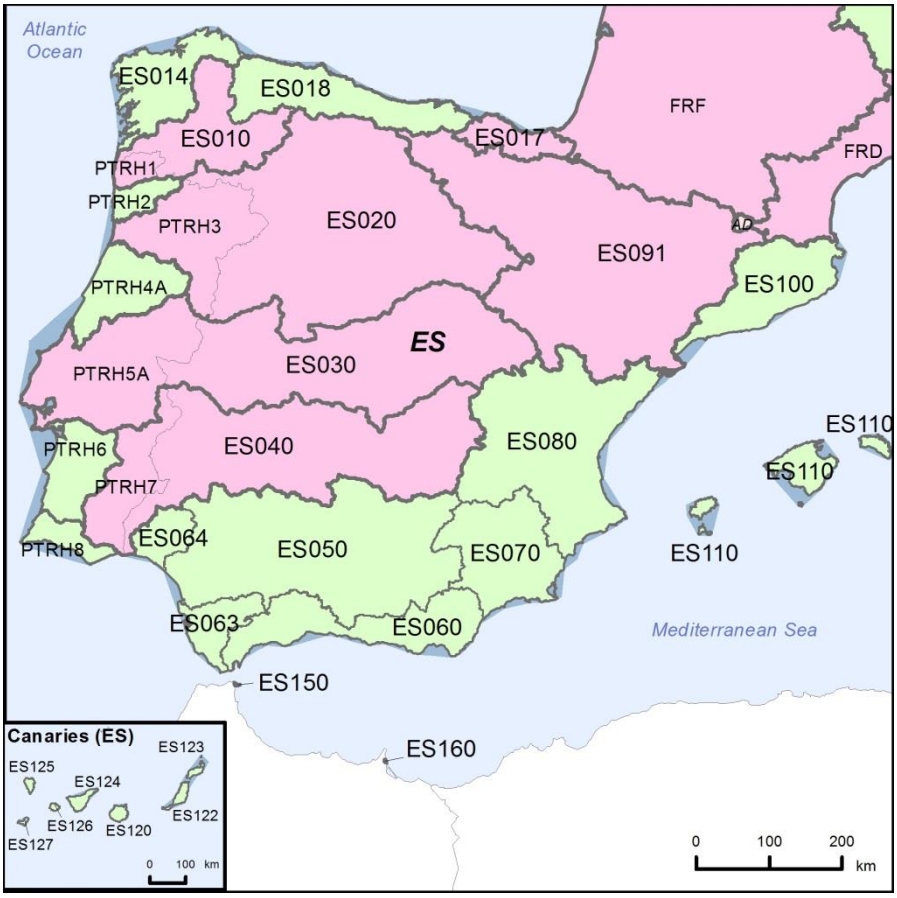
The Water Framework Directive (WFD) (2000/60/EC) requires in its Article 18 that each Member State reports its River Basin Management Plan(s) (RBMPs) to the European Commission. The second RBMPs were due to be adopted by the Member States in December 2015 and reported to the European Commission in March 2016.

This Member State Assessment report was drafted on the basis of information that was reported by Member States through the Water Information System for Europe (WISE) electronic reporting.

The Member State Reports reflect the situation as reported by each Member State to the European Commission in 2016 or 2017 and with reference to River Basin Management Plans (RBMP) prepared earlier. The situation in the Member States may have changed since then.

General Information

Map A Map of River Basin Districts



Source: WISE, Eurostat (country borders)

International River Basin Districts (within European Union)
International River Basin Districts (outside European Union)
National River Basin Districts (within European Union)
Countries (outside European Union)
Coastal Waters

The information on areas of the national river basin districts including sharing countries is provided in the following table:

Table A: Overview of Spain's River Basin Districts

RBD	Name	English Name	Size (km^2)	International	Countries sharing RBD
ES010	Miño-Sil	Miño-Sil	17588	✓	PT
ES014	Galicia-Costa	Galicia-Coast	16300		-
ES017	Cantábrico Oriental	Eastern Cantabrian	6391	✓	FR
ES018	Cantábrico Occidental	Western Cantabrian	18978		
ES020	Duero	Duero	78886	✓	PT
ES030	Tajo	Tagus	55784	✓	PT
ES040	Guadiana	Guadiana	55560	✓	PT
ES050	Guadalquivir	Guadalquivir	57686		-
ES060	Cuencas Mediterráneas Andaluzas	Andalusian Mediterranean Basins	20019		-
ES063	Guadalete y-Barbate	Guadalete and Barbate	6499		-
ES064	Tinto, Odiel y Piedras	Tinto, Odiel and Piedras	4945		-
ES070	Segura	Segura	20242		-
ES080	Júcar	Jucar	44871		-
ES091	Ebro	Ebro	85942	✓	AD, FR
ES100	Distrito de Cuenca Fluvial de Cataluña	Catalan River Basin District	18041		
ES110	Islas Baleares	Balearic Islands	8731		-
ES120	Gran Canaria	Gran Canaria	2111		-
ES122	Fuerteventura	Fuerteventura	2894		-
ES123	Lanzarote	Lanzarote	2118		-
ES124	Tenerife	Tenerife	2837		-
ES125	La Palma	La Palma	981		-
ES126	La Gomera	La Gomera	530		-
ES127	El Hierro	El Hierro	529		-
ES150	Ceuta	Ceuta	60	✓	MA
ES160	Melilla	Melilla	24	✓	MA

Source: River Basin Management Plans reported to WISE (Spain subsequently corrected the names of several river basin districts).

The share of Spain in the respective international RBDs is shown in the following table.

Table B: Transboundary river basins by category and % share in Spain

Name international river basin	National RBD	Countries sharing RBD	Coordination category			
			2		3	
			km²	%	km²	%
Miño/Minho	ES010	PT	16226	95.0		
Duero/Douro	ES020	PT	78859	80.7		
Guadiana	ES040	PT	55454	82.7		
Ebro	ES091	AD, FR	85534	99		
Segre (Sub-Basin Ebro/Rhone)	ES091	AD, FR	18750	95.2		
Lima/Limia	ES010	PT	1326	52.9		
Tajo/Tejo	ES030	PT	55772	78.3		
Garonne	ES017/ES091	FR	555	0.7		
Nive (Sub-Basin Adour-Garonne RBD)	ES017	FR	121	19.0		
Nivelle (Sub-Basin Adour-Garonne RBD)	ES017	FR	70	12.0		
Bidasoa (Sub-Basin Adour-Garonne RBD)	ES017	FR	689	97.0		
Ceuta	ES150	MA			60	
Melilla	ES160	MA			24	

Source: WISE electronic reporting

Category 1: International agreement, permanent co-operation body and international RBMP in place.
Category 2: International agreement and permanent co-operation body in place.
Category 3: International agreement in place.
Category 4: No co-operation formalised.

Status of second river basin management plan reporting

A total of 18 of the 25 RBMPs of Spain (Miño-Sil, Galicia-Coast, Eastern Cantabrian, Western Cantabrian, Duero, Tagus, Guadiana, Guadalquivir, Andalusian Mediterranean Basins, Guadalete and Barbate, Tinto, Odiel and Piedras, Segura, Jucar, Ebro, Catalan River Basin District, Balearic Islands, Ceuta, Melilla) were published between 18 July 2015 and 22 January 2016. Seven RBMPs (El Hierro, La Gomera, La Palma, Tenerife, Lanzarote, Fuerteventura, Gran Canaria[1]) were adopted between September 2018 and January 2019. Documents are available from the European Environment Agency EIONET Central Data Repository https://cdr.eionet.europa.eu/.

[1] Spain reported to the Commission that the RBMP La Gomera was adopted on 17 September2018, Tenerife and La Palma on 26 November 2018, Fuerteventura, Lanzarote, El Hierro on 26 December 2018, and Gran Canaria on 21 January 2019.

Key strengths, improvements and weaknesses of the second River Basin Management Plan(s)

The main strengths and shortcomings of the second RBMP of Spain are as follows:

- **Governance and public consultation**

  - A broad range of stakeholder groups were actively involved in the development of the RBMPs, including via advisory groups.

  - Spain has strengthened cooperation with Portugal on the implementation of the WFD and the preparation of their respective RBMPs.

  - While Spain has improved cooperation with France on river basin management, the information available suggest there is room for improvement in the third RBMPs.

  - For all but two RBDs, consultation of RBMPs and FRMPs was co-ordinated and steps have been taken to co-ordinate measures across the two Directives.

  - Spain did adopt and publish most of its RBMPs (18 out of 25) in accordance with the timetable in the WFD. Spain had not reported seven of its 25 RBMPs (Gran Canaria, Fuerteventura, Lanzarote, Tenerife, La Palma, La Gomera and El Hierro) and these have therefore not been included in this assessment. These plans have been recently approved by the Regional Government[2].

- **Characterisation of the RBD**

  - Further characterisation work of groundwater bodies has been undertaken since the first RBMPs, by describing the geological formation and whether or not they are layered. Spain has also included an assessment of linkages with surface water bodies and terrestrial ecosystems.

  - The Typology has not been made biologically relevant for all types for the second RBMPs. In addition, for a large proportion of water body types in all water categories, no equivalent intercalibration type was reported. If the results of the intercalibration exercise have not been appropriately translated to these national types then the validity

[2] Spain reported to the Commission that the RBMP La Gomera was adopted on 17 September2018, Tenerife and La Palma on 26 November 2018, Fuerteventura, Lanzarote, El Hierro on 26 December 2018, and Gran Canaria on 21 January 2019.

of the classification of ecological status/potential of a significant proportion of surface water bodies can be questioned.

- There are no water bodies in Spain that have had reference conditions established for all relevant hydromorphological or all relevant physicochemical quality elements. There are also gaps in terms of reference conditions for all relevant biological quality elements in all water categories.

- There have been improvements in the assessment of significant pressures with more water bodies identified as having pressures, as a consequence of a more detailed analysis of significant pressures. At the same time, for a number of RBDs, expert judgment is still used to define the significance of pressures, instead of numerical methods such as modelling which would make the analysis more quantitative and robust.

- All RBDs in Spain reported inventories of emissions, discharges and losses of priority substances, except Ceuta, but the inventories do not include all Priority Substances.

- **Monitoring, assessment and classification of ecological status**

  - The proportion of river water bodies included in surveillance monitoring increased in nine of the 16 RBDs for which there is relevant information for both the first and second RBMPs. However, it decreased in the other seven RBDs. For operational monitoring, the proportion of river water bodies covered increased in 10 RBDs and decreased in the other six.

  - There was a 39 % reduction in the number of surveillance monitoring sites and an 18 % reduction in the number of operational monitoring sites since the first RBMPs.

  - There are significant gaps in the monitoring of all required quality elements in surveillance monitoring. River Basin Specific Pollutants have been monitored in all water categories. A total of 221 pollutants have been selected. Standards have been set for some (but not all) pollutants in accordance with the Technical Guidance Document No 27. The analytical methods used are in line with Article 4(1) or Article 4(2) of the QA/QC Directive (2009/90/EC[3]) for almost all standards.

[3] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:201:0036:0038:EN:PDF

- The classification of ecological status is based on more comprehensive classification methods than was the case for the first RBMPs. More relevant biological quality elements were considered, e.g. fish and phytoplankton in rivers, as well as some hydromorphological and physicochemical quality elements.

- The majority of water bodies have been classified based on monitoring at the quality element level, which is a significant improvement since the first RBMPs.

- The overall ecological status/potential has slightly improved, but the proportion of water bodies at less than good status is still between 30 and 70 % for natural rivers in most RBDs.

- Most water bodies are classified with high or medium confidence, which is a great improvement since the first cycle

- **Monitoring, assessment and classification of chemical status in surface water bodies**

- Significant progress has been made in reducing the proportion of surface water bodies with unknown status since the first RBMPs (from 37 to 6 %).This resulted in a large increase in the proportion of surface water bodies with good chemical status (from 58 % to 87 %) and a small increase in the proportion with poor status from 5 to 6 %.

- 54 % of the classified water bodies were assessed based on monitoring, 45 % by expert judgement and less than 1 % by grouping. A relatively high proportion of water bodies were therefore classified by expert judgement, which could be linked to the low confidence in the assessment (40 % of surface water bodies were classified with low confidence).

- Territorial waters were not monitored and assessed for chemical status. There seemed to be some inconsistencies in the number of sites and water bodies reported for chemical monitoring in the other water categories. Three RBDs did not report any monitoring programme.

- In 10 RBDs, all Priority substances included in an inventory and discharged were monitored. In a further six RBDs, some of the substances discharged are not monitored. Not all inventories considered all priority substances, so it is not clear whether all discharged substances have been identified. The remaining RBDs did not report an inventory.

- The number of Priority Substances monitored in water for status assessment is variable depending on the RBD; between 4 and 41 Priority Substances are monitored. There is also a high degree of variability in the proportion of water bodies monitored between RBDs and water categories. The recommended minimum frequency were met at some sites for 40 of the 41 substances for operational and for all substances for surveillance monitoring. Fewer substances meet these recommended minimum frequencies in coastal and transitional waters than in surface freshwaters.

- Mercury, hexachlorobenzene and hexachlorobutadiene were monitored in biota for status assessment in four of the 18 RBDs, but not in all water categories (one additional RBD monitors only mercury and hexachlorobutadiene in biota). The spatial coverage appears to be very limited in these RBDs. The recommended minimum frequency was met at all sites in twoRBDs but at fewer sites in the remaining RBDs.

- Up to 14 substances were monitored for trend in sediment and /or biota depending on the RBD (nine RBDs did not report any trend monitoring). Monitoring was undertaken at some sites in all water categories. However, the spatial coverage appears to be very limited. The recommended minimum frequency was met in the majority of sites.

- **Monitoring, assessment and classification of quantitative status of groundwater bodies**

- 84 groundwater bodies are still not subject to groundwater quantitative monitoring. It has to be considered that information from the Canary Islands river basin districts has not been reported in the second cycle reporting. In river basin districts Ceuta and Melilla, there is no quantitative monitoring. The number of monitoring sites increased by approximately 15 % when comparing the two planning cycles.

- All groundwater bodies now have a clear status. About 25 % of the groundwater bodies are at risk of failing good quantitative status.

- The overall status situation improved: for the RBDs for which information is also available from the first RBMP, the number of groundwater bodies failing good quantitative status declined slightly.

- **Monitoring, assessment and classification of chemical status of groundwater bodies**

  - Efforts have been made in groundwater status assessment, so the number of groundwater bodies in unknown status has been significantly reduced since the first RBMPs (from 8 to 1 out of 729 groundwater bodies). 31 % of the total groundwater body area is failing good chemical status.

  - The coverage of groundwater bodies by monitoring of chemical status is not complete, neither for surveillance monitoring nor for operational monitoring. The coverage of groundwater bodies at risk by operational monitoring has increased since the first RBMP (18 %)

  - Not all substances causing risk are subject to monitoring. All WFD core parameters are monitored in seven river basin districts but in nine river basin districts the coverage is incomplete.

  - Threshold values have not been established for all substances causing risk and in two of 18 river basin districts natural background levels have not been considered.

- **Designation of Heavily Modified and Artificial Water Bodies and definition of Good Ecological Potential**

  - The second RBMPs include assessments of the significant adverse effects of measures on the use and wider environment and an assessment of better environmental options on the level of water bodies. However, no criteria and thresholds to define significant effects are provided in the RBMPs or the methodological documents.

  - In the first RBMPs, a full methodology for good ecological potential definition was missing. In the second RBMPs, 14 out of 18 RBDs, the CIS approach was applied to define good ecological potential. In the remaining four RBDs (Guadalquivir, Segura, Ceuta, Melilla), a hybrid approach was used.

  - In the second RBMPs, there is a specific national method in place for defining good ecological potential of reservoirs and ports. Good ecological potential has not been defined in terms of biology in the RBDs Ceuta and Melilla. For most RBDs, information is not entirely clear on whether actual values for biological quality elements are estimated or not for good ecological potential, except for reservoirs and ports, for which values for phytoplankton are defined at national level.

- Mitigation measures for defining good ecological potential have been reported for all 18 RBDs. In these RBMPs, fact sheets specific to each heavily modified water body included the expected changes due to the application of those mitigation measures.

- **Environmental objectives and exemptions**

  - An important effort has been done since the previous plans, which has led to a significant decrease in the number of water bodies for which the environmental objective was not set.

  - Environmental objectives for ecological and chemical status of surface water bodies have been reported in all RBDs as well as for chemical and quantitative status of groundwater. Information is also provided on when the objectives are expected to be achieved.

  - Important efforts have been made regarding the justifications of technical feasibility, disproportionate costs and natural conditions related to the application of exemptions in the second RBMPs, although there is room for improvement in the 3rd cycle.

  - Some important efforts have been made for a better application of Article 4(7), and explanation on the exemptions applied is provided in the specific fact sheets provided per water body.

- **Programme of Measures**

  - New legislation or regulations to implement the Programme of Measures in the first cycle was reported as necessary and has already been implemented in the 18 RBDs for which information was provided. However, only some measures have been completed from the first cycle of Programme of Measures in those 18 RBDs. Although progress seems to have been achieved on the issues identified in the European Commission recommendations, there are still some areas of implementation that have yet to be addressed.

  - A large number of national basic and supplementary measures are reported across a wide range of KTMs. A wide range of types of measure has been used. Coverage of significant pressures with operational KTM is variable for different RBDs.

- Indicators of the gaps to be filled by KTMs and indicators for the scale and progress with implementation of measures were provided, but for a number of pressures and RBDs, the information provided was incomplete.

- **Measures related to abstractions and water scarcity**

- Water abstraction and exploitation continues to be very significant for a large part of Spain, where many river basin districts have high levels of water exploitation index + (WEI+) and some of them are beyond the risk threshold of 40 %, e.g. RBDs Balearic Islands, Segura, Jucar and Guadalquivir. Most of the water abstraction or consumption data - and in particular for irrigation - rely on surveys and modelling, and are not always backed by metering.

- Basic measures such as abstraction control under Article 11(3)(e) are in place. River Basin Authorities have to maintain a Water Register of concessions to control abstractions, while water reuse is also foreseen as a measure in most of the river basin districts.

- No information on a systematic review of the concessions according to the WFD objectives has been found in the river basin management plans. No plan is included in the river basin management plans to extend and generalise the use of flow meters for all water abstractions and uses (especially for agriculture).

- Water pricing measures for water services from agriculture (KTM 11) are only considered for abstraction pressures in a few river basin districts (Guadalquivir, Guadalete and Barbate, Jucar) and are mainly focused on studies.

- **Measures related to pollution from agriculture**

- The link between pressures and measures related to pollution from agriculture is fully established.

- General binding rules under Article 11(3)(h) are applied for nitrates and pesticides in all RBDs. At the same time, supplementary measures beyond Nitrate Vulnerable Zones have been rarely included in the Programmes of Measures and are only reported with low budgets.

- It remains unclear from the information provided in the RBMPs, if measures reported are of voluntary or mandatory nature.

- The area of agricultural land to be covered by measures for achieving the environmental objectives is provided for several measures, but not for all.
- Financing of agricultural measures is not secured in all basins.

- **Measures related to pollution from sectors other than agriculture**

- The presentation of the information on measures against non-agricultural pollutants makes it difficult to assess their likely effectiveness.

- **Measures related to hydromorphology**

- Hydromorphological measures have been reported for more RBDs compared to the first RBMPs. However, a significant number of water bodies are affected by hydromorphological pressures, whose driver is unknown or obsolete.
- Indicators on the gap to be filled for significant hydromorphological pressures are provided for all RBDs but progress indicators for the KTM tackling these pressures are only reported for three of 18 RBDs. Therefore, no substantial conclusions can be drawn on the progress expected from measures over the next cycles.
- Ecological flows have been derived for all relevant water bodies but implemented only in some (work still ongoing). The timeline for completing the process of implementing ecological flows differs for different RBDs, while for other RBDs, no information is given on the relevant timeline. The second RBMPs also make reference to actions of prioritising the implementation of ecological flows in "strategic" or priority river stretches within the second cycle and in non-priority stretches by 2027.
- Specific measures included in the second RBMPs have clear links to Natural Water Retention Measures. However, the RBMPs do not provide clear explanations of how such measures contribute to water retention in their specific context.

- **Economic analysis and water pricing policies**

- Overall, more information has been presented as compared to the first RBMPs, including an updated economic analysis.
- A general methodology for calculating cost recovery resulted in a harmonised presentation of cost recovery rate results. Also, the methodology for Environmental

Costs has been streamlined, resulting in significantly higher costs than in the first planning cycle. The second RBMPs include the estimation of the financial, environmental and resource costs of the water services, as well as the income obtained by the different existing cost recovery instruments for the different water services in Spain.

- Regarding incentive pricing, some instruments target environmental costs, but important gaps remain, in particular regarding self-abstraction and diffuse pollution.

- **Considerations specific to Protected Areas (identification, monitoring, objectives and measures)**

- Protected Areas for all types listed in Annex IV of the WFD have been designated in Spain. The status of water bodies associated with these Protected Areas has been comprehensively reported.

- The reported extent of the monitoring programme associated with Protected Areas is limited and inconsistent with the number of Protected Areas.

- Progress since the first cycle with the definition of additional objectives for Protected Areas associated with Natura 2000 sites has been limited.

- **Adaptation to drought and climate change**

- Climate change has been considered in various ways in all river basin districts. However, KTM24 (climate change adaptation measures) is not made operational to address significant pressures in any of the river basin districts.

- None of the river basin management plans has applied any exemption under Article 4(6) for prolonged droughts (except Guadiana in the RBMP, but not according to WISE). According to the WISE reporting, no sub-plans are in place on water scarcity and droughts. It should be noted however, that Spain has initiated the review of the 2006-2007 drought management plans and they are expected to be approved in the near future.

Recommendations

- Spain should make sure that the preparation of the next RBMPs is carried out in accordance with the WFD timetable, to ensure the timely adoption of the third RBMPs.

- Spain should continue to improve international cooperation, including coordinated assessments of the technical aspects of the Water Framework Directive such as ensuring a harmonized approach for status assessment and a coordinated Programme of Measures in order to ensure the timely achievement of the WFD objectives.

- Spain needs to continue its work on the establishment of reference conditions, in particular for relevant hydromorphological and physico-chemical quality elements.

- There has been some progress on the integration of the analysis of pressures and impacts into the Programmes of Measures. Spain needs to ensure that all pressures are factored into the analysis, in line with previous recommendations.

- Further work is needed on the apportionment of pressures among individual sectors, in order to be able to identify the most appropriate measures.

- Spain should ensure all water bodies are delimited, in particular in the Canary Islands, where so far no river, lake or transitional water bodies have been identified.

- Spain should improve its monitoring program to ensure extensive and consistent monitoring of water bodies, with appropriate coverage of all relevant quality elements, as there are still important gaps and as there has been a decrease in the number of monitoring sites since the first RBMPs.

- Spain should have a clear and transparent method for the selection of River Basin Specific Pollutants and clearly identify the substances that are causing failure in water bodies. Spain should complete the definition of environmental quality standards for all River Basin Specific Pollutants.

- Spain should continue to progress in the transfer of the results of the intercalibration into all national types, and provide clear information on the methods that have been intercalibrated.

- Spain should complete the development of assessment methods for fish in all water bodies, and for all relevant quality elements in coastal and transitional waters.

- The number of unknowns should be further reduced and Spain should continue improving the confidence in the assessment of surface water chemical status for all water categories (including territorial waters, whose status should be assessed). Monitoring should be performed in the relevant matrix in a way that ensures sufficient spatial coverage and temporal resolution to reach sufficient confidence in the assessment for all water bodies, if necessary in combination with robust grouping/extrapolation methods. If a different matrix or reduced frequencies are used, the corresponding explanations should be provided, as required by the Directives. All priority substances discharged should be monitored.

- Spain should further improve trend monitoring for all relevant priority substances, in a way that provides sufficient temporal resolution and spatial coverage, in all RBDs.

- Efforts need to be continued to complete the methodology for heavily modified water body designation for all RBDs, including clear and transparent criteria for significant adverse effects on the use or the wider environment. Good ecological potential needs to be defined also in terms of biological quality elements for all RBDs.

- There has been an increase in the number of exemptions in the second RBMPs, although the approach taken has been to use deadline exemptions (Article 4(4)) instead of less stringent objectives (Article 4(5)), in order not to reduce the level of ambition regarding the WFD objectives. The justifications and related criteria for technical feasibility and disproportionate costs need to be clearly distinguished between Article 4(4) and 4(5) exemptions due to the different nature of both exemptions.

- Further progress is required in order to ensure that the application of Article 4(7) exemptions are in line with the WFD obligations, and a more specific and detailed assessment is carried out case by case.

- All the KTMs should be operational and measures should cover all the significant pressures, including individual Priority Substances, River Basin Specific Pollutants and Groundwater pollutants, including from non-agricultural sources.

- It should be clarified how the measures contribute to close the gaps to good status, and supplementary measures should be identified and implemented where necessary.

- Continued progress is needed to extend the use of flow meters, to ensure that all abstractions are metered and registered, and that permits are adapted to available resources. Users need to be required to report regularly to river basin authorities on the

volumes actually abstracted. This information should be used to improve quantitative management and planning, especially in those river basin districts which present significant abstraction pressures and high values of WEI+.

- In the third RBMPs, Spain should state clearly to what extent, in terms of area covered and pollution risk mitigated, basic measures (minimum requirements to be complied with) or supplementary measures (designed to be implemented in addition to basic measures) will contribute to achieving the WFD objectives. Spain should also identify sources of funding (e.g. CAP Pillar 1, RDP) as appropriate, to facilitate successful implementation of these measures and ensure that the next Nitrates Action Programme includes controls on phosphorus applications.

- More hydromorphological measures need to be implemented and reported for all water bodies affected by hydromorphological pressures, and for all RBDs.

- Spain should continue its efforts to establish ecological flows for all relevant water bodies, and ensure its implementation as soon as possible.

- Spain should apply cost recovery for water use activities having a significant impact on water bodies or justify any exemptions using Article 9(4). Spain should continue to clearly present how financial, environmental and resource costs have been calculated and how the adequate contribution of the different users is ensured. It should also continue to transparently present the water-pricing policy and provide a transparent overview of estimated investments and investment needs.

- Spain should define in the third river basin management plans the status of all protected areas, to ensure a harmonised approach across the country.

- Spain should derive the quantitative and qualitative needs for protected habitats and species, translated into specific objectives for each Protected Area, which should be inserted in the RBMPs. Appropriate monitoring and measures should also be included in the RBMPs.

- Spain should ensure that new drought management plans are adopted, particularly in light of the fact that abstraction is identified as a significant pressure for groundwater bodies in the country.

Topic 1 Governance and public participation

1.1 Assessment of implementation and compliance with WFD requirements in the second cycle

1.1.1 Administrative arrangements – river basin districts

Spain has designated 25 river basin districts (RBDs).

Eight of Spain's 25 RBDs are part of international river basin districts: Spain shares International RBDs with Portugal (for Miño-Sil, Duero, Tagus and Guadiana), with France (for Eastern Cantabrian, Ebro), with Andorra (Ebro) and Morocco (Ceuta and Melilla).

1.1.2 Administrative arrangements – competent authorities

Spain has indicated over a large number of competent authorities for its RBDs. These include the River Basin Authorities of RBDs that cross Autonomous Regions and Water Boards for Spain's islands. These bodies have a long list of main roles: monitoring and assessment of status of groundwater and surface water, economic analysis, pressure and impact analysis, enforcement of regulations, preparation of RBMP and Programmes of Measures, public participation, implementation of measures, coordination of implementation and reporting to the European Commission[4].

The Autonomous Regions have the following main roles: economic analysis, enforcement of regulations, public participation, implementation of measures and coordination of implementation.

Five national Ministries: Agriculture, Food and Environment have main roles for all RBMP activities. Other ministries – for Health, Social Services and Equality; Industry, Energy and Tourism; Foreign Affairs and Cooperation; and Public Works and Transport – also have roles, including for the enforcement of regulations and coordination of implementation[5].

Finally, local authorities (entidades locales) are indicated as competent authorities with main roles for: enforcement of regulations, economic analysis, preparation of Programme of Measures, public participation, implementation of measures and coordination of implementation.

[4] Spain has informed that detailed information about this issue and in general about the second RBMPs reported, can be accessed online in the national RBMPs database: https://servicio.mapama.gob.es/pphh-web/.

[5] Spain subsequently informed that ministerial departments has been restructured in accordance with Royal Decree 355/2018, of June 6, 2018.

1.1.3 River Basin Management plans – sub-plans and Strategic Environmental Assessment)

None of the RBMPs submitted had sub-plans which were reported in WISE but Spain has informed that all the RBMPs dedicated several chapters to explain the relation with other plan addressing specific issues such as Water Scarcity and Droughts, Rural Planning or Agriculture. Strategic Environmental Assessments were prepared for all the RBMPs reported as of July 2017.

1.1.4 Public consultation

For the RBMPs reported, all documents were available for consultation for the requisite six months. The public and interested parties were informed by direct mailing, internet, invitations to stakeholders, local authorities, media (papers, television, radio), printed materials, written consultation and by the official journal(s). Documents for consultation were available via direct mailing (e-mail) and for download.

In all the RBDs reported, stakeholders were actively involved via advisory groups, involvement in the drafting of plans and also in regular exhibitions. In all the RBDs reported, stakeholder groups involved came from the following sectors: agriculture/farmers; energy/hydropower; industry; local/regional authorities; navigation/ports; NGOs/nature protection; water supply and sanitation; and others.

Public consultation had the following impacts on the Plans: addition of new information, adjustment to specific measures, changes to selection of measures, changes to the methodology used, commitment to action in the next RBMP and commitment to further research.

1.1.5 Integration with other EU legislation: Floods Directive and Marine Strategy Framework Directive

For all but two RBDs (Galicia-Coast and Balearic Islands), joint consultation was organised for the RBMPs and the Flood Risk Management Plans and Spain has informed that the design of both type of plans has been strongly coordinated. None of the RBMPs published went through joint consultation with the Marine Strategy Framework Directive.

1.1.6 International coordination and co-operation

For the four International RBDs Spain shares with Portugal, it is reported that there is international agreement and a permanent co-operation body in place (designated as category

2): notably, the Albufeira convention for the protection and sustainable use of the waters of the Spanish-Portuguese watersheds is in place since 1998.

For the two international RBDs shared with France, international coordination is also designated as category 2 cooperation, i.e. there is an international agreement and permanent co-operation body in place. The Ebro Flood Risk Management Plan refers to several agreements, including the Agreement of Toulouse, signed in 2006, under which it was agreed to make independent plans, and to hold technical meetings for coordination. Spain has informed that several meetings took place to coordinate and review the second RBMPs. Other bodies in place include the Joint Commission on the Lanós Lake, where Spain has informed that yearly meetings have taken place, and the Upper Garonne Joint Commission.

Spain subsequently informed that within the framework of the Agreement of Toulouse, there have been conversations between France and Spain on mapping and other details on the characterisation of water bodies. Spain also informed that the International Commission of the Pyrenees holds yearly plenary meetings. In addition, a Commission on the exploitation of the International Channel D'Angoustrine and Llivia was formally established in 2013. The Ebro RBD has signed a convention with DREAL Nouvelle-Aquitanie for the implementation of a joint platform for information exchange (for further information see the reports on international coordination on the Water Framework Directive).

For the International RBDs shared with Morocco there is an international agreement on water management in place without permanent co-operation mechanisms (designated as category 3 cooperation).

For RBMPs published, Spain reported that public consultation was coordinated with neighbouring Member States and countries: for example, Spain's draft Flood Risk Management Plans were translated into Portuguese language and were available on the website of the competent Portuguese authority.

The joint planning process under the Albufeira Convention for the second RBMPs indicates that cooperation between Portugal and Spain covered: identification and delimitation of transboundary bodies of water, identification of heavily modified water bodies, typology of water bodies, protected areas, significant pressures, monitoring, assessment of the state of water bodies, programmes of measures, environmental objectives and their exceptions, public participation, strategic environmental assessment and the monitoring and implementation of

plans[6]. In the Guadiana international RBD, for example, seven meetings were held to promote coordination on the development of the respective RBMPs in Portugal and Spain; the two Member States moreover made a commitment to strengthen cooperation in the third cycle (for further information see the reports on international coordination on the Water Framework Directive).

1.2 Main changes in implementation and compliance since the first cycle

Cooperation between Spain and Portugal has strengthened.

1.3 Progress with Commission recommendations

- Recommendation: *Reinforce the cooperation with Portugal and France in shared RBDs (covering characterisation, pressures and impacts, monitoring, assessment of status, public consultation, measures, etc.), ensuring that there is a common understanding for transboundary water bodies and catchments for these issues. The outcomes of such cooperation (in particular with Portugal) should be reflected in the RBMPs or ad-hoc background documents.*

  Assessment: Cooperation between Portugal and Spain has strengthened in the second cycle, covering issues including monitoring, status assessments, public consultation and measures. Information is available, for example in documents prepared in the process under the Albufeira Convention.

  The information available indicates that France and Spain have increased cooperation in some areas, such as information exchange.

  This recommendation has been fulfilled, in terms of cooperation with Portugal; but partially fulfilled in terms of cooperation with France.

- Recommendation: *adopt as soon as possible the outstanding RBMPs for the Canary Islands.*

  Assessment: The first RBMPs of the Canary Islands were adopted and subsequently reported around mid-2015 (with one reported in 2016). This recommendation has thus

[6] http://www.apambiente.pt/_zdata/Politicas/Agua/PlaneamentoeGestao/PGRH/2016-2021/DocumentoCoordenacaoInternacional_2016_2021_ES_PT.pdf

been fulfilled for the first RBMPs. As for the second RBMPs, as of mid-2017, 18 of Spain's 25 RBDs had published RBMPs.

- Recommendation: *ensure consultation and adoption of the second RBMPs according to the WFD timetable, avoiding delays.*

  Assessment: 17 RBMPs were published with a small delay but six RBMPs were not published as of late 2018. This recommendation can be considered partially fulfilled.

- Recommendation: *Fill as soon as possible the gaps in transposition in the intra-community RBDs.*

  With regard to this Recommendation, the CSWD cites ECJ judgement C-151/12 and calls for full transposition of the WFD for regions (Autonomous Communities) responsible for intra-community RBDs.

  Assessment: Spain has informed that the Spanish Regional Authorities completed the required transposition before the approval of the second RBMPs, thus the recommendation is considered fulfilled.

Topic 2 Characterisation of the River Basin District

2.1 Assessment of implementation and compliance with WFD requirements in the second cycle

2.1.1 Delineation of water bodies and designation of heavily modified and artificial water bodies

Overall, in 18 of the 25 RBDs in Spain (there are no reported data for the seven Canary Island RBDs in 2016), there was a small decrease in the numbers of lake water bodies (0.9 %) and coastal waters (15 %) but there was a small increase in the number of river water bodies (0.42 %) and transitional water bodies (3.3 %) between the two cycles (Table 2.1). For coastal water, bodies there was a decrease in 3 RBD, an increase in one and no change in the other 12 RBDs with coastal waters. There was a decrease in transitional water bodies in one RBD, an increase in one and no change in the 12 other RBDs with transitional waters. Five RBDs showed an increase in numbers, four a decrease and nine no change in river water body numbers between the two cycles. For lakes, there were increases in four RBDs a decrease in three RBD and no change in the other 12 RBDs with lakes.

Overall in Spain, there was an increase of 162 in the number of river water bodies designated as heavily modified between the two cycles (Figure 2.1) For the first cycle, 16.8 % of river water bodies were designated as heavily modified, in the second cycle, the percentage of heavily modified as a proportion of total river water bodies had increased to 20 %. The largest increase was in the Duero RBD (number from 80 (11.5 % of total river water bodies) to 208 (30 % of total river water bodies) and proportion of total river length from 4.6 % to 28 %). The RBMP explained that this was due to a review of designated heavily modified water bodies in connection to hydrological and hydromorphological pressures. There was also an increase in numbers of heavily modified rivers in five other RBDs, no change in nine RBDs and decrease in two RBDs. There was a small decrease in the number of heavily modified lake water bodies (5) and coastal water bodies (7) and an increase in heavily modified transitional water (10) in Spain as a whole between the two cycles. Further information related to changes in the designation of heavily modified water bodies is provided in Chapter 7.2. of this report.

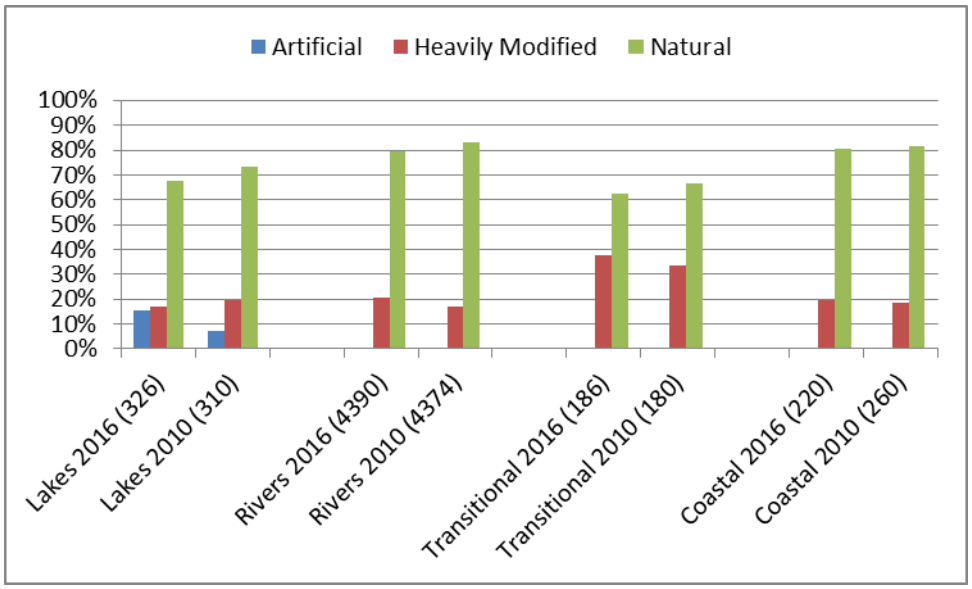
Table 2.1 Number and area/length of delineated surface water bodies in Spain for the second and first cycles

Year	RBD	Lakes		Rivers		Transitional		Coastal	
		Number of water bodies	Total area (km^2) of water bodies	Number of water bodies	Total length of water body (km)	Number of water bodies	Total area (km^2) of water bodies	Number of water bodies	Total area (km^2) of water bodies
2016	ES010	3	1	272	3 973	2	15	2	21
2016	ES014	0	0	415	4 172	22	105	29	3 198
2016	ES017	3	0	117	1 581	14	49	4	578
2016	ES018	7	2	250	3 696	21	91	15	1 553
2016	ES020	19	17	690	12 949	0	0	0	0
2016	ES030	16	15	307	7 361	0	0	0	0
2016	ES040	59	62	251	7 156	4	51	2	62
2016	ES050	35	896	395	9 282	13	132	3	490
2016	ES060	10	22	133	2 056	7	15	27	2 067
2016	ES063	10	2	65	1 017	10	122	12	535
2016	ES064	6	1	47	781	11	157	4	176
2016	ES070	6	38	90	1 448	1	25	17	1 209
2016	ES080	19	42	304	5 140	4	15	22	2 134
2016	ES091	106	65	698	12 293	16	161	3	308
2016	ES100	27	4	261	3 784	25	2	33	1 600
2016	ES110	0	0	94	576	36	44	41	3 741
2016	ES150	0	0	0	0	0	0	3	40
2016	ES160	0	0	1	5	0	0	3	11
2016	Total	326	1 169	4 390	77 272	186	985	220	17 725
2010	ES010	3	1	270	3 957	4	25	1	16
2010	ES014	0	0	411	4 189	22	105	29	3 198
2010	ES017	11	4	109	1 537	14	48	4	578
2010	ES018	7	2	250	3 694	21	92	15	1 556
2010	ES020	14	12	696	12 945	0	0	0	0
2010	ES030	7 (16)	1	307 (308)	7 342	0	0	0	0
2010	ES040	58	61	249	7 154	4	51	2	63
2010	ES050	35	949	392	9 301	13	138	3	491
2010	ES060	8	21	133	1 998	7	15	27	2 066
2010	ES063	10	2	65	997	10	123	12	536
2010	ES064	5	1	48	783	11	158	4	175
2010	ES070	6	22	90	1 435	1	25	17	1 209
2010	ES080	19	42	300	5 078	4	15	22	2 136

Year	RBD	Lakes		Rivers		Transitional		Coastal	
		Number of water bodies	Total area (km^2) of water bodies	Number of water bodies	Total length of water body (km)	Number of water bodies	Total area (km^2) of water bodies	Number of water bodies	Total area (km^2) of water bodies
				(304)					
2010	ES091	110	68	700	12 148	8	155	3	310
2010	ES100	27	4 073	261	3 790	25	1 899	33	1 599 385
2010	ES110	0	0	94	579	36	44	42	3 746
2010	ES150	0	0	0	0	0	0	6	536
2010	ES160	0	0	1	5 349	0	0	5	1 240
2010	Total	329	5 260	4 381	82 277	180	2 894	260	52 680 958

Source: WISE electronic reporting. Values in brackets provided by Spain in the frame of the assessment.

Figure 2.1 Proportion of surface water bodies in Spain designated as artificial, heavily modified and natural for the second and first cycles. Note that the numbers in parenthesis are the numbers of water bodies in each water category



Source: WISE electronic reporting

Table 2.2 shows the differences in size distribution of surface water bodies in Spain between the second and first cycles. The changes in minimum sizes are difficult to compare because they were not reported for each RBD and there also appears to be some unit errors in the reporting. The minimum size criteria reported were 10 km^2 catchment area for rivers and for lakes it varied between RBD but the largest minimum surface area was 0.5 km^2.

There was a small increase in the numbers of groundwater bodies (2 %) overall (Table 2.3): with a decrease in numbers in three RBDs, an increase in one RBD and no change in 14 RBDs. The changes in the number and delineations are based on the results of work done in close collaboration with the Geological and Mining Institute of Spain

Table 2.2 Size distribution of surface water bodies in Spain in the second and first cycles

Year	RBD	Lake area (km^2)			River length (km)			Transitional (km^2)			Coastal (km^2)		
		Min	Max	Average	Min	Max	Average	Min	Max	Average	Min	Max	Average
2016	ES010	0.03	0.97	0.48	3.47	69.89	16.42	5.23	9.74	7.49	5.53	15.35	10.44
2016	ES014				2.82	63.02	10.54	0.14	18.92	4.77	1.6	656.12	110.28
2016	ES017	0.04	0.16	0.09	4.06	78.00	14.64	0.41	19.09	3.52	10.47	231.6	144.61
2016	ES018	0.07	0.5	0.23	3.47	80.82	15.40	0.41	18.7	4.33	1.8	499.87	103.53
2016	ES020	0.02	3.8	0.88	4.05	97.00	19.98						
2016	ES030	0.01	7.82	0.95	2.48	161.20	29.56						
2016	ES040	0.03	22.35	1.05	0.86	234.89	35.96	1.52	25.71	12.81	4.61	57.85	31.23
2016	ES050	0.02	345.77	25.61	1.07	136.73	27.46	0.54	30.61	10.15	122.2	213.22	163.28
2016	ES060	0.02	13.15	2.21	4.33	74.12	17.28	0.61	6.08	2.14	0.57	478.54	76.56
2016	ES063	0.03	1.12	0.23	1.93	121.54	17.53	0.25	80.93	12.24	0.1	106.19	44.58
2016	ES064	0.05	0.87	0.22	1.46	134.43	19.53	2.3	42.42	14.29	12.77	126.09	44.03
2016	ES070	0.84	20.1	6.39	1.42	68.11	18.81	25.16	25.16	25.16	0.79	390.73	71.13
2016	ES080	0.01	24.89	2.22	1.60	99.45	18.62	0.19	14.1	3.69	2.6	268.16	97.02
2016	ES091	0	11.3	0.61	0.80	140.35	19.27	0.11	70.09	10.04	62.48	171.87	102.7
2016	ES100	0	1.32	0.15	1.76	80.52	15.26	0	0.37	0.08	0.65	247.33	48.5
2016	ES110				0.36	54.03	6.33	0.01	21.21	1.23	0.55	906.83	91.25
2016	ES150										0.99	25.06	13.48
2016	ES160				5.38	5.38	5.38				2.01	4.73	3.51
2010	ES010	0.03	0.97	0.48	3.00	70.00	16.49	4.17	9.74	6.33	15.98	15.98	15.98
2010	ES014				2.82	63.00	10.63	0.14	18.9	4.77	1.6	655.85	110.26
2010	ES017	0.06	1.31	0.48	4.03	76.97	14.23	0.42	19.08	3.46	10.46	231.22	144.43
2010	ES018	0.07	0.5	0.23	3.75	80.75	15.39	0.41	18.68	4.37	1.81	500.42	103.75
2010	ES020	0.09	3.49	0.89	4.05	96.88	19.95						
2010	ES030	0.01	0.46	0.11	0.01	161.21	29.49						

Year	RBD	Lake area (km^2)			River length (km)			Transitional (km^2)			Coastal (km^2)		
		Min	Max	Average	Min	Max	Average	Min	Max	Average	Min	Max	Average
2010	ES040	0.03	22.33	1.05	0.82	235.05	35.95	1.52	25.79	12.85	4.62	58	31.31
2010	ES050	0.02	359.1	27.11	1.07	136.64	27.69	0.92	36.57	10.64	122.4	213.56	163.56
2010	ES060	0.02	13.15	2.59	4.23	69.99	16.79	0.61	6.08	2.14	0.57	478.22	76.53
2010	ES063	0.03	1.12	0.23	1.92	121.61	17.19	0.25	81.02	12.26	0.1	106.41	44.65
2010	ES064	0.07	0.87	0.25	1.46	134.82	19.57	2.3	42.52	14.33	12.75	125.79	43.69
2010	ES070	0.84	20.11	7.48	1.42	68.12	19.13	25.17	25.17	25.17	0.79	390.67	71.13
2010	ES080	0.01	24.91	2.22	1.59	99.42	18.60	0.19	14.11	3.69	2.61	268.34	97.09
2010	ES091	0	11.29	0.65	0.79	96.60	18.92	0.03	70.23	19.42	63.05	172.4	103.4
2010	ES100	0.23	1,323.11	150.84	1.76	80.51	15.28	4.34	364.49	75.97	647.22	247,421.95	48,466.22
2010	ES110				0.36	53.97	6.16	0.01	21.22	1.23	0.1	909.63	89.18
2010	ES120										5.77	195.72	89.29
2010	ES122										20.59	607.64	248.1
2010	ES123										0.91	988.32	212.07
2010	ES124										0.26	541.6	72.67
2010	ES125										1.36	204.17	55.13
2010	ES126										15.89	76.09	40.58
2010	ES127										4.8	230.62	87.17
2010	ES150										987,841.11	25,066,119.47	13,482,672.28
2010	ES160				5.35	5.35	5.35				2,009,619.00	4,745,374.00	3,537,643.33

Source: WISE electronic reporting

Table 2.3 Number and area of delineated groundwater bodies in Spain for the second and first cycles

Year	RBD	Number	Area (km^2)		
			Minimum	Maximum	Average
2016	ES010	6	188.26	7,787.77	2,931.24
2016	ES014	18	42.87	2,442.48	722.31
2016	ES017	20	2.54	1,610.00	286.67
2016	ES018	20	21.02	3,985.93	693.16
2016	ES020	64	71.84	5,571.13	1,365.10
2016	ES030	24	68.51	4,332.10	910.52
2016	ES040	20	12.26	2,576.96	1,123.93
2016	ES050	86	27.39	4,845.53	394.12
2016	ES060	67	4.29	1,037.22	155.48
2016	ES063	14	24.15	361.1	135.86
2016	ES064	4	64.93	630.86	376.76
2016	ES070	63	6.71	1,586.79	241.75
2016	ES080	90	10.26	7,121.90	450.27
2016	ES091	105	17.8	4,083.45	520.36
2016	ES100	37	5.71	754.73	252
2016	ES110	87	3.07	295.52	54.58
2016	ES150	1	11.15	11.15	11.15
2016	ES160	3	1.92	5.89	4.4
2016	Total	729			
2010	ES010	6			2934.1
2010	ES014	18	43.07	2,455.49	729.51
2010	ES017	28	2.5	977	205
2010	ES018	20	21	3,992.00	693.58
2010	ES020	64			1232.6
2010	ES030	24			910.1
2010	ES040	20			1124.1
2010	ES050	60			624.6
2010	ES060	67			155.2
2010	ES063	14	24.16	362.38	304.5
2010	ES064	4	63.33	470.2	257.5
2010	ES070	63			243.8
2010	ES080	90			453.6
2010	ES091	105			521.5

Year	RBD	Number	Area (km^2)		
			Minimum	Maximum	Average
2010	ES100	39			288.6
2010	ES110	90			52.6
2010	ES120	10			155.8
2010	ES122	4			413.2
2010	ES123	1			846.1
2010	ES124	4			508.2
2010	ES125	5			142
2010	ES126	5			73.6
2010	ES127	3			89.7
2010	ES150	1			11.2
2010	ES160	3			5
2010	Total	748			

Source: WISE electronic reporting.

Table 2.4 summarises the information provided by Spain on how water bodies have evolved between the two cycles for both surface water and groundwater. For groundwater bodies and river water bodies the main changes were deletions and splitting of water bodies.

Table 2.4 Type of change in delineation of groundwater and surface water bodies in Spain between the second and first cycles

Type of water body change for second cycle (wiseEvolutionType)	Lakes	Rivers	Transitional	Coastal	Groundwater
Aggregation		2			7
Splitting	2	22	1		28
Aggregation and splitting		10		2	21
Change	16	1401	99	68	298
Creation	6	14	3	1	1
Deletion		24	1	1	3
Code	33	387	33	18	41
Extended area				1	1
Reduced area					2
No change	269	2554	50	170	362
Total water bodies before deletion	326	4414	187	261	764
Delineated for second cycle (after deletion from first cycle)	326	4390	186	260	729

Source: WISE electronic reporting

2.1.2 Identification of transboundary water bodies

Spain reported transboundary coastal (two RBDs), river (five RBDs) and transitional (three RBDs) water bodies. The delineation of transboundary water bodies was reported to have been coordinated with some but not all neighbouring Member States. For example, the Eastern Cantabrian RBD has updated the list of transboundary water bodies with France and some specific coordination work has been carried out between the two countries.

In the Duero RBD, in accordance with the Albufeira Convention, some action has been taken to coordinate delineation of water bodies with Portugal. In the Guadiana RBD, Portugal informed that one water body was changed by being split in three and consequently Spain has changed the water body (20664 Embalse de Alqueva) to be split into three water bodies, corresponding to the Portuguese ones. This close cooperation and coordination with Portugal took place for the four shared RBDs (Miño, Duero, Tagus and Guadiana), in the framework of the Albufeira Convention.

Spain has not reported that any transboundary groundwater bodies have been delineated.

2.1.3 Typology of surface water bodies

Overall, there was a significant increase in the number of water body types in all four water categories in Spain as a whole for the second cycle compared to the first (Table 2.5). The largest increase was for rivers where there was an increase from 32 types for the first RBMPs to 48 types in the second cycle RBMP. There was no change in numbers of types in six of the 18 RBDs that reported information. There was a decrease in number of river types in four RBDs, an increase in 5 RBDs and no change in seven RBDs: one RBD did not identify rivers. No information is provided in the RBMPs on why the number of types has increased.

The RBMPs do not include information regarding the cross-checking of the different theoretical water body types against biological data, nor a detailed description of the typology methodology, typology factors (descriptors) and related ranges, methods for testing typology versus biological data. There is also no information in the RBMPs on whether system A or B has been used[7].

Overall in Spain, 29 types of coastal water bodies were identified. 35 % of coastal water bodies in Spain were reported not to have corresponding intercalibration types. For a number of national types, intercalibration types were reported in some RBDs but in other RBDs no

[7] Spain clarified that the works involving reference conditions and their adjustment with biological data, as well as related issues, have been coordinated at national level since 2005 and their results were used in the preparation of the RBMPs.

corresponding intercalibration types were reported for the same national type code. Spain clarified that there are some mismatches between the national and the common types, and further work is planned to solve these mismatches.

Of the 36 lake types reported for Spain, 32 were reported not to have a corresponding intercalibration type, representing 90 % of lake water bodies in Spain.

Table 2.5 Number of surface water body types at RBD level in Spain for the first and second cycles

RBD	Rivers		Lakes		Transitional		Coastal	
	2010	2016	2010	2016	2010	2016	2010	2016
ES010	9	11	3	3	1	1	1	1
ES014	7	7	0	0	3	3	7	7
ES017	6	8	3	3	3	3	1	1
ES018	12	12	5	5	6	6	3	3
ES020	17	17	7	8		0		0
ES030	27	19	8	8		0		0
ES040	14	12	12	12	1	1	2	2
ES050	17	20	12	11	3	3	2	2
ES060	13	13	7	9	4	4	4	4
ES063	7	7	4	4	2	2	3	3
ES064	6	7	1	2	3	3	2	2
ES070	10	9	4	3	2	1	5	6
ES080	12	12	7	7	2	2	6	6
ES091	9	16	19	18	2	4	1	1
ES100	15	14	12	11	3	3	8	9
ES110	2	3	0	0	4	3	4	4
ES150	0	0	0	0	0	0	2	2
ES160	1	1	0	0	0	0	2	2
Total	32	48	30	36	13	18	21	29

Source: WISE electronic reporting. Note that the total is not the sum of the types in each RBD as some types are shared by RBDs.

Overall in Spain, 48 different (coded) river types were reported. Some of the national type codes were reported to have an intercalibration type in some RBDs but not in others, and in other RBDs different intercalibration types were reported for the same national type code. 47 % of the river water bodies in Spain did not have a reported corresponding intercalibration type.

18 different (coded) transitional water body types were reported in Spain. In some RBDs, a national type code had a reported intercalibration type whereas in another RBD no

corresponding intercalibration type was reported for the same national type code. 69 % of transitional water bodies in Spain did not have a reported intercalibration type.

16 of the 18 RBDs that have reported to WISE to date have identified coastal waters, 14 RBDs lake waters, 17 RBDs river waters and 14 RBDs transitional waters. Three coastal waters types were shared by four RBDs and 13 types by only one RBD. In terms of lakes, three types were common to six RBDs and nine different types were reported by only one RBD. Two river types were common to 10 RBDs and eight types were reported by only one RBDs. For transitional waters one type was common to five RBDs and eight types were reported by only one RBD. Only one national type had the same code but different description (AC-T10 in coastal waters), but this was due to a reporting mistake concerning one of the three RBDs that reported this national type

No information was found in the RBMPs about whether typology has been coordinated with other Member States.

2.1.4 Establishment of reference conditions for surface water bodies

Table 2.6 shows the percentage of surface water body types in Spain with reference conditions established for different quality elements for the first and second cycles. In lakes, reference conditions have been established for all biological quality elements for 78 % of types, for some biological quality elements for 19 % of types and for no biological quality elements for 3 % of types. Reference conditions have not been established for any hydromorphological quality elements for any of lakes types and all lake types have reference conditions for some physicochemical quality elements. There are seven cases where common types reported by different RBDs have different information on the quality elements used in the establishment of reference condition. For example, lake water body type L-T21 is reported to have reference conditions for all biological quality elements in the Duero, Guadiana, Guadalquivir, Ebro and Andalusian Mediterranean RBD and for none in the Guadalete and Barbate RBD.

Almost a third of the river types had reference conditions established for all biological quality elements, 69 % for some biological quality elements and 2 % for none of the biological quality elements. No type had reference conditions for all of the relevant hydromorphological or physicochemical quality elements, and 35 % of types did not have reference conditions for any of the hydromorphological quality elements. All river types had reference conditions for some physicochemical quality elements. 21 river types shared between more than one RBD had different information reported on the establishment of quality elements. For example, river water body type R-T19 had reference conditions for all biological quality elements in the Guadalquivir RBD and for none in the Tinto, Odiel and Piedras RBD.

Table 2.6 ***Percentage of surface water body types in Spain with reference conditions established for all, some and none of the biological, hydromorphological and physicochemical quality elements***[8]

Water category	Water types reference conditions established	Biological quality elements	Hydromorphological quality elements	Physicochemical quality elements
Rivers (48)	All	29 %		
	Some	69 %	65 %	100 %
	None	2 %	35 %	0 %
Lakes (36)	All	78 %		
	Some	19 %	0 %	100 %
	None	3 %	100 %	0 %
Transitional (18)	All	6 %		
	Some	89 %	0 %	94 %
	None	6 %	100 %	6 %
Coastal (29)	All	38 %		
	Some	62 %	14 %	100 %
	None	0 %	86 %	0 %

Source: WISE electronic reporting

In coastal waters, reference conditions have not been established for all relevant hydromorphological and physicochemical quality elements in any of the types. Reference conditions have been established for some physicochemical quality elements in all reported types, for some hydromorphological quality elements in around 14 % of types and in 86 % of types for none of the hydromorphological quality elements. Around 38 % of types had reference conditions for all relevant biological quality elements and 62 % of types for some biological quality elements. For two types shared between more than one RBD, different information was reported for the completeness of reference conditions: for example, a coastal water body type AC-T04 was reported to have reference conditions for all biological quality elements in the Catalan RBD and for some in the Western Cantabrian RBD[9].

None of the 18 transitional water body types had established reference conditions for any of the hydromorphological quality elements. In terms of biological quality elements, only 6 % of types had reference conditions in terms of all biological quality elements, 89 % for some and 6 % for none. Two types shared between more than one RBD had different information reported on the establishment of reference conditions.

[8] Spain subsequently highlighted that values in this table did not match the national database.

[9] Spain subsequently clarified that differences between RBDs for shared types are due to reporting mistakes, as the reference conditions are set per type and not per RBD.

There are no water bodies in Spain that have had reference conditions established for all relevant hydromorphological or all relevant physicochemical quality elements. The list of reference conditions is fixed in the Spanish legislation. Two measures foreseen in the RBMPs of the Miño-Sil and Guadiana RBDs concern coordination with Portugal on the identification of type-reference conditions, and further work is planned, jointly with Portugal, to improve the harmonisation of methodologies for status assessment of transboundary water bodies.

2.1.5 Characteristics of groundwater bodies

All 18 Spanish RBDs that have reported their second RBMPs have characterised their groundwater bodies in terms of their geological formation and as to whether or not the water bodies were layered. All RBDs also identified which groundwater bodies were linked to surface water bodies and/or terrestrial ecosystems.

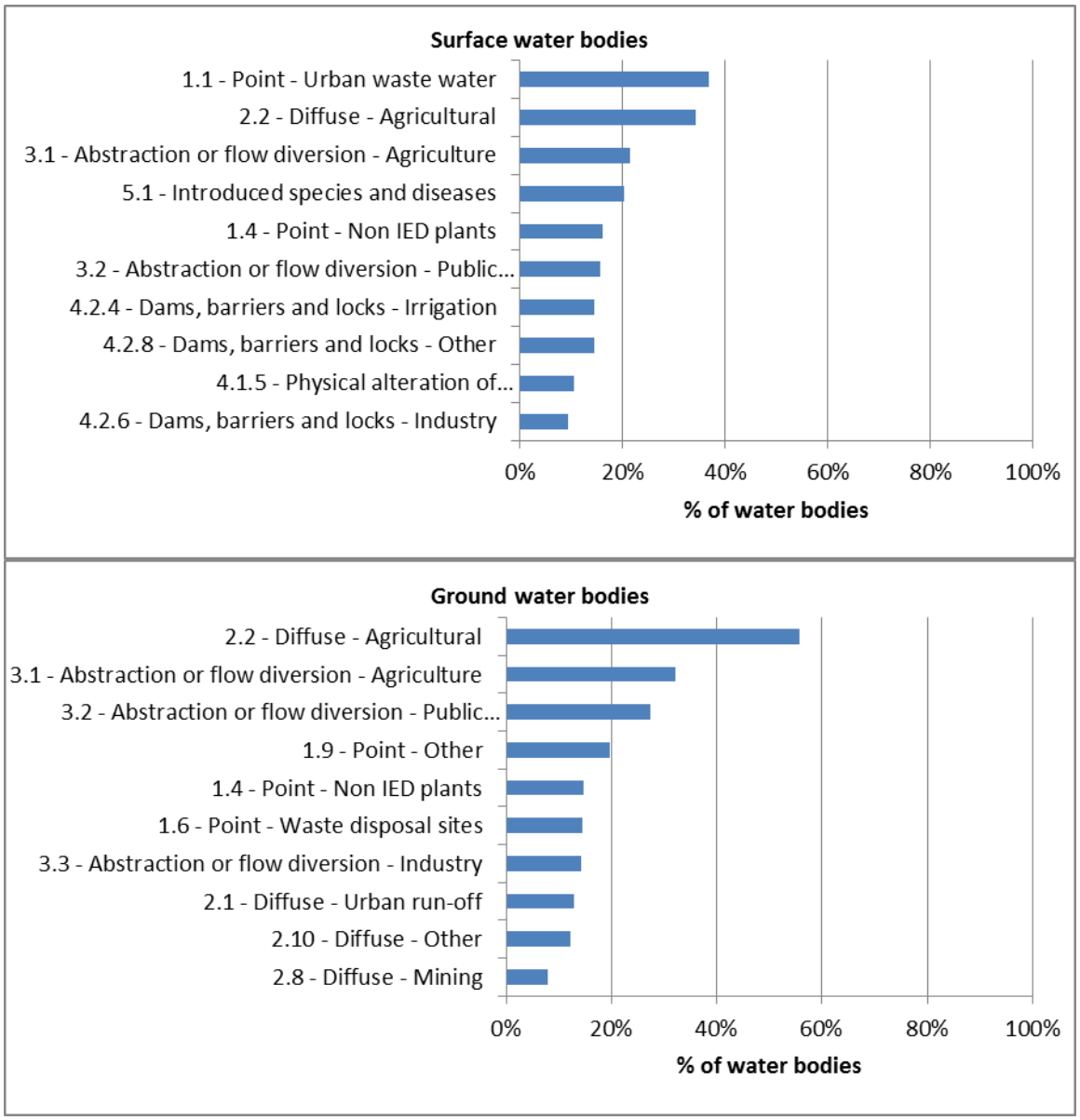
2.1.6 Significant pressures on water bodies

In terms of surface water bodies in Spain, the pressure with the greatest percentage of affected water bodies was point urban waste water (37 % of surface water bodies), followed by diffuse agriculture (34 %), abstraction or flow diversion for agriculture (22 %) (Figure 2.2). 16 % of surface water bodies were affected by abstraction or flow diversion for public water supply and 20 % by introduced species and diseases and 15 % by dams, barriers and locks for irrigation.

The three surface water pressures reported by most RBDs were urban waste water (all 18 RBDs); abstraction or flow diversion for public water supply (17 RBDs); and diffuse agricultural (16 RBDs). It is difficult to compare the number and proportion of water bodies affected by significant pressures because of changes introduced to the types of pressures reported for the second cycle and because Spain only reported pressures at the aggregated level in the first cycle: disaggregated pressures were reported in the second cycle. Figure 2.3 shows that there is an apparent increase in diffuse, point and hydromorphological pressure types, due to a more detailed analysis of pressures compared to the one done for the first RBMPs. Changes in methodologies for defining pressures are discussed below.

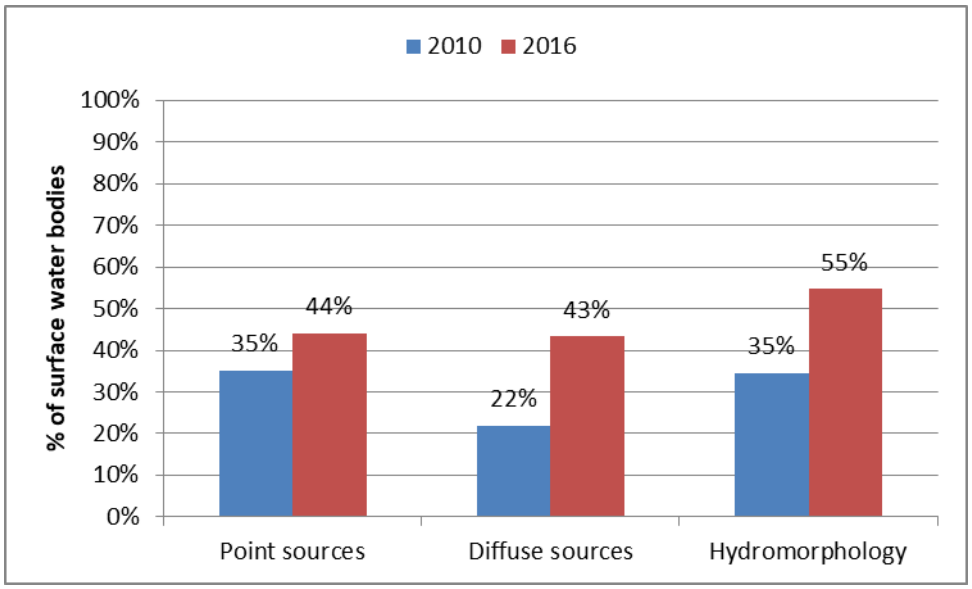
The most significant pressures on groundwater bodies in terms of proportion of groundwater bodies affected at the national level was diffuse agricultural (56 % of groundwater bodies), abstraction or flow diversion for agriculture (32 %), and abstraction or low diversion for public water supply (27 %) (Figure 2.2). The three most common pressures on groundwater at the country level were diffuse agriculture (significant in 14 of the 18 RBDs with reported information), abstraction or flow diversion for agriculture (12 RBDs) and abstraction or flow diversion for public water supply (10 RBDs).

Figure 2.2 The 10 most significant pressures on surface water bodies and groundwater bodies in Spain for the second cycle



Source: WISE electronic reporting

Figure 2.3 ***Comparison of pressures on surface water bodies in Spain in the first and second cycles. Pressures presented at the aggregated level. Note there were 5122 identified surface water bodies for the second cycle and 5124 for the first cycle***



Source: WISE electronic reporting

2.1.7 Definition and assessment of significant pressures on surface and groundwater

The approach adopted for the first RBMPs relied first on a qualitative assessment and, in a second stage, on a quantitative assessment based on a simplified model. The objective of this approach study was to identify the water bodies at risk of failing the WFD environmental objectives. The qualitative assessment included thresholds of significance for the various pressure categories. An inventory of pressures was used as input for modelling tools.

For the second RBMP, expert judgement was exclusively used by three RBDs (Andalusian Mediterranean Basins, Guadalete and Barbate and Tinto, Odiel and Piedras) to define significant pressures to surface waters. Expert judgment was also used by the Galicia-Coast RBD to define three of four assessed pressure groups (diffuse source pressures were defined by a combination of expert judgment and numerical tools). Catalan RBD and Balearic Islands also used expert judgment to define diffuse source and water flow pressures, respectively. A combination of expert judgment and numerical tools (including modelling) was used in 12 RBDs for point source and water abstraction pressures, 11 for diffuse pressures and in 10 for water flow pressures. The Segura RBD used numerical tools for all pressures types reported. The exclusive use of expert judgment may make the assessment of the significance of

pressures to be less robust than if more quantitative tools (such as numerical tools) had been developed and applied. Significance of pressures to surface water was defined in terms of thresholds and in terms of the potential failure of objectives in the same 12 of the 18 reported RBDs.

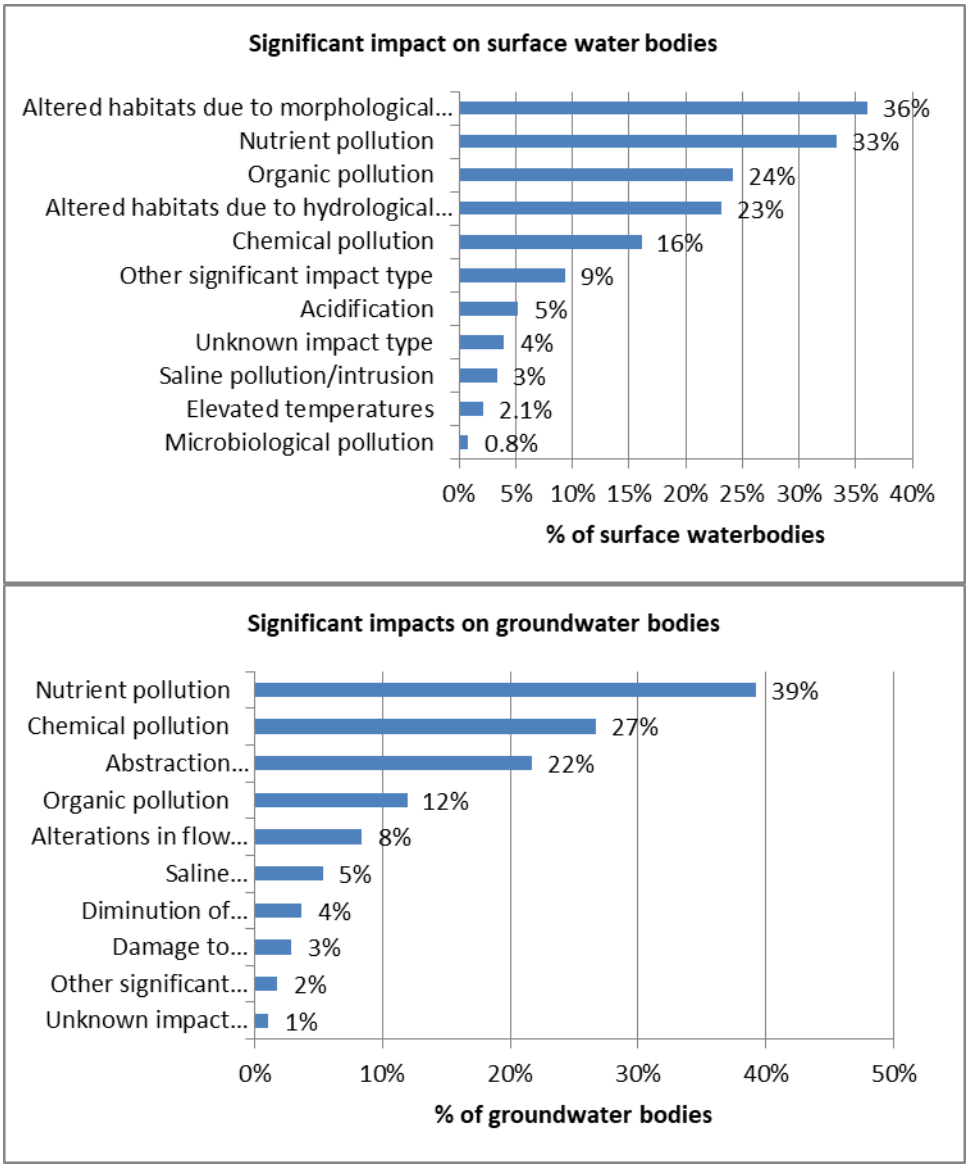
Expert judgment was used by more RBD to define significant pressures to groundwater than for surface waters. Four RBDs (Tagus, Andalusian Mediterranean Basins, Guadalete and Barbate, and Tinto, Odiel and Piedras) used it for all four pressure types, Balearic Islands for the three pressure types assessed, Catalan RBD for two of the four pressure types assessed and Galicia-Coast RBD for three of the four types assessed. Expert judgment was used for seven RBDs in terms of point source pressures and for six RBDs for diffuse source pressure, water abstraction pressures and for artificial recharge pressures. Numerical tools were exclusively used by Segura and Jucar RBDs for all assessed pressures. As for surface waters, similarly, the exclusive use of expert judgment may make the assessment of the significance of pressures to be less robust than if more quantitative tools (such as numerical tools) had been developed and applied. Significance of pressures on groundwater bodies has been defined in terms of thresholds in 15 of the 18 reported RBDs and was linked to the potential failure of good status in 12 RBDs.

No information was found in the RBMPs on the changes in the methodology or the criteria for the assessment of significance from the first to the second RBMPs. Eastern Cantabrian, Duero and Guadiana RBDs reported that there was a re-assessment of pressures. However, following the criteria already applied in the first planning cycle (Legal Order ARM 2656/2008), Duero RBD also described how newly agricultural and livestock data available at local district level helped to facilitate the pressures assessment; and Guadiana RBD referenced additional information available from Portugal on pressures.

2.1.8 Significant impacts on water bodies

The most significant impact on surface water bodies in Spain in terms of the proportion of water bodies was altered habitats due to morphological changes (36 % of water bodies and significant in all RBDs that reported) followed by nutrient pollution (33 % surface water bodies and 17 RBDs) and organic pollution (24 % and 17 RBDs) (Figure 2.4). Chemical pollution was reported to be significant in 17 RBDs and affected 16 % of surface water bodies in Spain.

Figure 2.4 ***Significant impacts on surface water and groundwater bodies in Spain for the second cycle. Percentages of numbers of water bodies.***



Source: WISE electronic reporting

The most significant impact type at the country level in terms of proportion of groundwater bodies was nutrient pollution that affected 39 % of groundwater bodies and was reported by 13 of the 18 RBDs (Figure 2.4). The next most significant was chemical pollution affecting 27 % of groundwater bodies across 11 RBDs and abstraction exceeding available groundwater resources in 22 % of groundwater bodies across 10 RBDs.

2.1.9 Groundwater bodies at risk of not meeting good status

16 of the 18 RBDs in Spain that reported had some groundwater bodies that were at risk of failing of not meeting good chemical status, ranging from one in the Eastern Cantabrian RBD

(5 %) to 79 (92 %) in the Guadalquivir RBD. Overall in Spain 55 % of groundwater bodies were at risk. Nitrate was the pollutant causing a risk of failing good chemical status in the most groundwater bodies in Spain (46 % of all groundwater bodies) followed by chloride (11 %) and pesticides (9 %). Nitrate was causing a risk in 13 of the 18 reported RBDs, chloride in eight RBDs and pesticides in three.

10 of the 18 reported RBDs indicated that there were groundwater bodies at risk of not being in good quantitative status. All three groundwater bodies were at risk in the Melilla RBD and the next highest proportion of groundwater bodies at risk was in the Segura RBD (68 %): overall in Spain, 24 % of groundwater bodies were at risk. Water balance was reported as the cause of the risk to quantitative status in all 10 RBDs that indicated that some groundwater bodies were at such risk. Overall, water balance was the cause of the risk in 23 % of groundwater bodies in Spain.

2.1.10 Quantification and apportionment of pressures

There are 20 different types of pressures reported to be significant on surface water for which specific measures have not been reported: for example in four RBDs this is in terms of point urban water, in four RBDs for point waste disposal sites and three for abstraction or flow diversion for industry. Spain subsequently explained that these pressures were not addressed by measures because they did not lead to significant impacts. Diffuse agricultural pressures were significant in 14 RBDs: gaps to the achievement of objectives were identified in these RBDs and measures to address the pressures were reported in each. Abstraction and flow diversion for agriculture (10 RBDs), for public water supply (eight RBDs), industry (four RBDs) and fish farms in one RBD were reported to be significant, gaps and measures to the achievement of objectives were reported in each: this indicated that there has been some apportionment of these pressures between the responsible sectors in some RBDs.

In terms of groundwater, the RBD that reported the most types of pressures (13) with gaps to the achievement of objectives was Jucar. On the other hand, the Guadalquivir RBD reported the most types of pressure (13) on groundwater without associated gaps: Guadalquivir also reported three pressures with gaps. The significant pressure on groundwater where most RBDs (14) reported gaps was diffuse agriculture, followed by abstraction or flow diversion for agriculture (10 RBDs), public water supply (eight RBDs) and from industry (four RBDs). Gaps were not reported in terms of point source pressures from urban waste water in four RBDs,

from waste disposal sites in four RBDs and from Industrial Emissions Directive[10] plants in three RBDs.

In terms of point source pressures to surface waters from urban waste water, gaps had been identified for 16 of the 18 RBDs where these pressures were reported to be significant, and measures implemented. No gaps or measures were reported for the other two RBDs (Balearic Islands and Melilla, though relatively few surface water bodies were affected: 21 and one respectively). Gaps had also been reported for other sectors responsible for point source pressures: storm overflows (four out of five RBDs with this significant pressure), Industrial Emissions Directive plants (13 out of 14 RBDs), non-Industrial Emissions Directive plants (10 RBDs out of 12 RBDs), contaminated sites or abandoned industrial sites (one out of two RBDs), waste disposal sites (seven out of 12 RBDs), mine waters (six out of eight RBDs) and aquaculture (six out of eight RBDs). Gaps to the achievement of objectives had also been reported for 13 of the 16 RBDs reporting diffuse agriculture as a significant pressure. Gaps to the achievement of objectives in terms of abstraction or flow diversion for public water supply were reported for 10 of the 17 RBDs with this as a significant pressure and for 12 of the 14 RBDs in terms of agriculture. A gap was not reported for pressures arising from public water supply in Guadalquivir where 260 (58 %) of surface waters were affected by this significant pressure and where no specific measures to tackle this pressure have been reported. In summary, gaps were not reported for all significant pressures on surface water in all RBDs because not all the significant pressures as identified by Spain generate impacts.

In terms of surface water, the RBD that reported gaps for the most pressures types (35) was Western Cantabrian followed by Ebro (32) and Miño-Sil (31). The RBD that reported the fewest types of pressures (1) with gaps was Ceuta. Guadalquivir (25), Balearic Islands (24) and Catalan RBD (20) reported the most types of pressures without associated gaps: these three RBDs did report gaps for 6, one and 26 types of pressure respectively.

16 RBDs reported gaps for point source pressures to surface waters: two did not. There were reported gaps for diffuse agriculture pressures in 13 RBDs: three did not report gaps. There were also reported gaps for abstraction or flow diversion pressures from agriculture in 12 RBDs and two RBDs did not report gaps for this pressure. The type of pressure without reported gaps in the most RBDs was abstraction or flow diversion pressures for public water supply (7 RBDs): gaps for this pressure had been reported by 10 other RBDs.

[10] Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control) http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32010L0075.

29 different groundwater pollutants and 43 different chemical substances in surface waters were reported with gaps to the achievement of objectives in Spain as a whole. The groundwater pollutant reported with gaps by the most RBDs (11) was nitrate, followed by chloride by seven RBDs. Lead, cadmium and nickel were the chemical substances in surface waters that were reported with gaps by the most RBDs: 12, 11 and 10, respectively.

2.1.11 Inventories of emissions, discharges and losses of chemical substances

Article 5 of the Environmental Quality Standards Directive (2008/105/EC[11]) requires Member States to establish an inventory of emissions, discharges and losses of all Priority Substances and the eight other pollutants listed in Part A of Annex I EQS Directive for each RBD, or part thereof, lying within their territory. This inventory should allow Member States to further target measures to tackle pollution from priority substances. It should also inform the review of the monitoring networks, and allow the assessment of progress made in reducing (or suppressing) emissions, discharges and losses for priority substances. [12]

All RBDs in Spain reported inventories, except Ceuta. Four RBDs reported inventories for 30 (Eastern Cantabrian) or 35 (Western Cantabrian, Ebro and Catalan RBD) Priority Substances. Seven RBDs reported inventories for less than 10 Priority Substances, notably Miño-Sil (4)[13]. The remaining six RBDs had inventories for 11 to 19 Priority Substances.

4-nonylphenol, octylphenol (4-(1,1',3,3'-tetramethylbutyl)-phenol), carbon tetrachloride, trichloromethane, total cyclodiene pesticides (aldrin + dieldrin + endrin + isodrin), Total DDT (DDT, p,p' + DDT, o,p' + DDE, p,p' + DDD, p,p') and brominated diphenylethers (congener numbers 28, 47, 99, 100, 153 and 154) were not reported as being included in the inventory by any of the RBDs that reported, even if Spain clarified that they were indeed included in the

[11] Directive 2008/105/EC of the European Parliament and of the Council of 16 December 2008 on environmental quality standards in the field of water policy, amending and subsequently repealing Council Directives 82/176/EEC, 83/513/EEC, 84/156/EEC, 84/491/EEC, 86/280/EEC and amending Directive 2000/60/EC of the European Parliament and of the Council
http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:02008L0105-20130913

[12] Spain subsequently stated that the emissions inventory is done on the basis of, amongst other elements, the pollutants in the waste water effluents. In this sense, the effluents have been analysed, and loads or concentrations can be obtained for each water body. The parameters that are monitored are directly associated with the characterisation of these waters. Spain stated that there are also other emissions that form part of these inventories, control over which is not the direct jurisdiction of the basin authorities. However, it must be pointed out that the information about the emissions into the water from industrial facilities and urban treatment plants is inventoried in the state's "Pollutant Release & Transfer Register" (PRTR) and is validated by the River Basin Authorities, taking into account that information is only given about those emissions that at the source exceed a certain threshold established in the register itself.

[13] Spain subsequently stated that the correct numbers are 33 substances (Eastern Cantabrian) and 31 (Western Cantabrian, Ebro and Catalan RBD) and that 5 RBDs had inventories for 11 to 19 Priority Substances.

Eastern Cantabrian RBD inventory. However, lead, mercury, nickel and cadmium were included by all the 17 RBDs that reported an inventory.

The two step approach from the Common Implementation Strategy Guidance Document No 28 has not been followed for any of the substances included in the inventories.

The Guidance Document also describes a Tiered approach (comprising four tiers in total). An increase in tier corresponds to an increase in understanding of sources and pathways. For these inventories, the Guidance Document recommended to implement Tier 1+ 2 to capture both point and diffuse sources, at least for substances deemed relevant at RBD-level. Spain implemented these two tiers for all substances included in the inventories. The data quality was assessed as uncertain.

2.2 Main changes in implementation and compliance since the first cycle

Overall in 18 of the 25 RBDs in Spain (there are no reported data for the seven Canary Island RBDs in 2016), there was a small increase in the numbers of groundwater bodies (2 %), a small decrease in the number of lake (0.9 %) and coastal water bodies (15 %) and a small increase in the number of river water bodies (0.42 %) and transitional water bodies (3.3 %) between the two cycles. There have also been some improvements such as the geographic delineation of the connection of six transitional and river water bodies. For groundwater bodies, the RBMPs reported that several of them have been grouped, and a new one delineated.

In the Guadiana RBD, there has been the new delineation of five transboundary water bodies with Portugal since the first cycle.

Overall in Spain, for the first cycle 16.8 % of river water bodies were designated as heavily modified, in the second cycle, the percentage of heavily modified as a proportion of total river water bodies had increased to 20 %. The largest increase was in Duero (number from 80 (11.5 % of total river water bodies) to 208 (30 % of total river water bodies) and proportion of total river length from 4.6 % to 28 %).

Overall, there was significant increase in the number of water body types in all four water categories in Spain as a whole for the second cycle compared to the first. The largest increase was for rivers where there was an increase from 32 types for the first to 48 types in the second RBMP. The RBMPs explain that reference conditions have been improved (e.g. adopting recent ones of the National regulation).

It is difficult to compare the situation in the first RBMPs with that in the second. However, it is clear from the reporting of the second RBMPs to WISE that reference conditions still have not been completed for all relevant quality elements in all water categories and RBDs.

Because there has been a re-delineation of surface water bodies in Spain between the two cycles resulting in 28 fewer surface water bodies for the second cycle and because of significant differences between the defined pressure types between the two cycles, it is difficult to make a quantitative comparison of pressures between the two cycles. The most comparable pressure types between the cycles are point source and diffuse source pressures at an aggregated level. In the first RBMPs, 34.8 % of surface water bodies in Spain were subject to significant point source pressures, this had increased to 44.1 % in 2016. For diffuse source pressures, 23.4 % of surface water bodies were affected in the first RBMPs, which increased to 43.2 % in the second cycle. No significant pressures were reported for 1958 (38.3 %) surface water bodies in Spain in the first cycle. In the second cycle, the number had decreased to 1057 (20.6 %), which reflects the improvements in the analysis of significance of pressures used for the second RBMPs. The RBMPs reported that there was a re-assessment of pressures and more data available on agriculture and livestock at district level which helped facilitate the pressures assessment.

2.3 Progress with Commission recommendations

- Recommendation: *Consider reviewing the legislation to incorporate explicitly the identification, by way of the pressures and impacts analysis, of water bodies at risk.*

  Assessment: Spain has improved its pressure and impacts analysis since the first cycle but there are a number of RBDs where expert judgment is used to define the significance of pressures rather than more numerical methods such as modelling which would make the analysis more quantitative and robust. However, there is evidence that additional quantitative data has been used. Spain reported that the legislation has been reviewed and Royal Decree 817/2015 establishes the criteria for monitoring and assessing the status of the surface waters and the Environmental Quality Standards. This recommendation can therefore be considered as fulfilled.

- Recommendation: *Ensure that there is a proper integration of the pressures and impacts analysis, the status assessment and the design of the Programme of Measures. Avoid defining the Programme of Measures on the basis of business as usual and a non-transparent assessment of what can be done, but rather on a genuine gap analysis*

that identifies which measures are needed to achieve good status and can also support the justification of exemptions.

Assessment: There has been a gap analysis for all the significant pressures that can cause significant impacts in the surface waters and groundwater and measures have been established to address those pressures. Further progress is needed to better correlate the pressures and impacts analysis, the status assessment and the design of the Programme of Measures. There has been some progress on this aspect of the recommendation and therefore this recommendation has been partially fulfilled.

- Recommendation: *Ensure that RBMPs apportion impacts to pressures and sources/drivers, to increase the understanding of which activities and sectors are responsible and* in *which proportion - for achieving objectives.*

  Assessment: As indicated above a gap analysis appears to have been performed for the second RBMP in some RBDs in Spain. This analysis has identified which sectors are responsible for some significant pressures e.g. point source pollution. In some of the RBMPs a matrix is reported that includes drivers and impacts showing the relationship between them. However, the numbers of water bodies affected were not included and therefore there was not a quantitative assessment. There is no evidence that source apportionment has been undertaken and therefore this recommendation has been partially fulfilled.

- Recommendation: *Ensure all water bodies are delimited, in particular in the Canary Islands, where so far no river, lake or transitional water bodies have been identified.*

  Assessment: The Canary Island RBDs have not reported their second RBMPs and therefore progress with this recommendation cannot be assessed; this recommendation is so far not fulfilled.

Topic 3 Monitoring, assessment and classification of ecological status in surface water bodies

3.1 Assessment of implementation and compliance with WFD requirements in the second RBMPs

3.1.1 Monitoring of ecological status/potential

Monitoring programmes

There was a wide variation in the number of monitoring programmes reported by each of the 18 of the 25 RBDs in Spain that had reported, with the Ebro RBD reporting 41 and four other RBDs only 1. The Andalusian Mediterranean Basins, Guadalete and Barbate and Tinto, Odiel and Piedras RBDs reported one programme (hydrological plan) that covered all four surface water categories and groundwater. The only reported programme for the Melilla RBD was for surveillance monitoring of coastal waters: note that this RBD had also identified rivers. No reported monitoring programme in Spain included territorial waters which are required to be monitored for chemical status only.

Monitoring sites

It is difficult to assess the changes of total numbers of monitoring sites in Spain because there are no reliable data for the first RBMPs. However, there are comparable data for sites used for surveillance and operational monitoring.

Table 3.1 compares the number of monitoring sites used for surveillance and operational purposes from the first to the second RBMPs, and Table 3.2 gives the number of sites used for different purposes for the second RBMPs.

Overall for the 18 RBDs in Spain that had reported on the second RBMPs, there was a 39 % reduction in the number of surveillance sites between the first RBMPs (5529 sites) and the second (3353 sites). There was a smaller reduction (18 %) in the number of operational sites between the two periods, 3362 for the first RBMPs and 2753 for the second. The ratio between surveillance and operational sites was 1:6 for the first RBMPs and 1:2 for the second indicating that there had been a proportionally larger reduction in surveillance compared to operational sites.

Table 3.1 ***Number of sites used for surveillance and operational monitoring in Spain for the second and first RBMPs. Note that for reasons of comparability with data reported in the first RBMPs, the second RBMPs data does not take into account whether sites are used for ecological and/or chemical monitoring***

	Rivers		**Lakes**		**Transitional**		**Coastal**	
	Surv.	**Op**	**Surv.**	**Op**	**Surv.**	**Op**	**Surv.**	**Op**
Second RBMPs								
ES_010	147	90	0	0				
ES_014	153	35	0	0	44	1	41	12
ES_017	207	89	5	0	33	4	21	1
ES_018	61	55	5	2	131	13	58	
ES_020	160	569	14	2				
ES_030	357	179	0	0				
ES_040	148	243	21	16	7	3	5	
ES_050	31	114	0	0	12		6	
ES_060	130	74	10	6	8	7	34	6
ES_063	37	37	10	0	14	14	15	15
ES_064	35	20	4	1	14	14	5	3
ES_070	88	67	4	6	7		31	66
ES_080	202	262	14	18				
ES_091	337	186	41	20	1	1		
ES_100	262	259	28	0	28		320	157
ES_110	0	33	0	0		20		26
ES_150	0	0	0	0			7	7
Total by type of site	*2355*	*2312*	*156*	*71*	*299*	*77*	*543*	*293*
Total number of monitoring site used for surveillance and/or operational monitoring	*3637*		*187*		*324*		*699*	
First RBMPs								
ES_010	86	74	0	0	5	0	0	0
ES_014	519	29			68	0	70	0
ES_017	165	239	6	0	25	4	11	1
ES_018	505	204	8	3	187	73	106	64
ES_020	819	726	32	2				
ES_030	466	169	20	4				
ES_040	165	217	18	17	8	6	5	0
ES_050	274	114	4	0	41	20	9	0
ES_060	48	72	3	2	9	9	46	18
ES_063	30	79	4	4	21	21	35	35

	Rivers		Lakes		Transitional		Coastal	
	Surv.	**Op**	**Surv.**	**Op**	**Surv.**	**Op**	**Surv.**	**Op**
ES_064	30	64	5	6	42	42	16	16
ES_070	101	78	6	1	7	0	31	104
ES_080	154	101	20	17	31	12	226	113
ES_091	358	286	40	22	42	41	36	36
ES_100	301	111	29	7	28	7	31	16
ES_110	63	33			31	20	72	15
ES_150							7	7
ES_160	0	1					4	0
Total by type of site	*4084*	*2597*	*195*	*85*	*545*	*255*	*705*	*425*
Total number of monitoring sites	*6681*		*280*		*800*		*1130*	

Source: Member States electronic reporting to WISE.

Table 3.2 Number of monitoring sites in relevant water categories used for different purposes for the second RBMPs in Spain: Note that no differentiation is made between sites used for ecological monitoring and/or chemical monitoring. Also there are differences between the RBDs included in this Table and the previous Table.

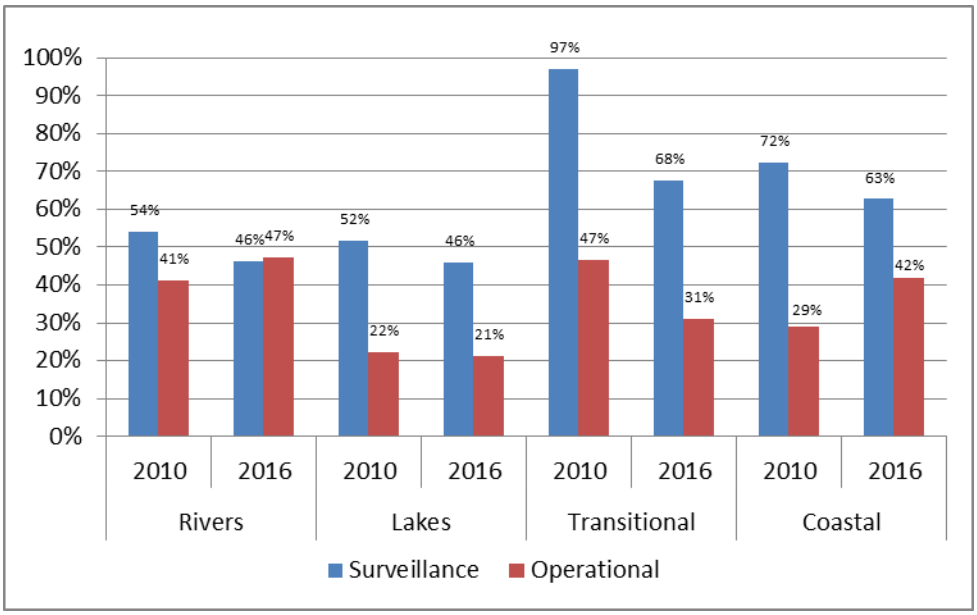
Monitoring Purpose	Lakes	Rivers	Transitional	Coastal
BWD - Recreational or bathing water - WFD Annex IV.1.iii	17	124	59	366
CHE - Chemical status	43	1010	279	347
DRI - Groundwater abstraction site for human consumption		20		
DWD - Drinking water - WFD Annex IV.1.i	11	891	7	6
ECO - Ecological status	175	2522	345	750
HAB - Protection of habitats or species depending on water - WFD Annex IV.1.v	17	675	1	
INT - International network of other international convention		3		
INV - Investigative monitoring	30	536	9	
MSF - Marine Strategy Framework Directive monitoring network		3		384
NID - Nutrient sensitive area under the Nitrates Directive - WFD Annex IV.1.iv	5	65	5	79
OPE - Operational monitoring	71	2312	77	293
QUA - Quantitative status		109		
REF - Reference network monitoring site	28	326	20	14
RIV - International network of a river convention (including bilateral agreements)		37	2	1
SEA - International network of a sea		46		

Monitoring Purpose	Lakes	Rivers	Transitional	Coastal
convention				
SHE - Shellfish designated waters - WFD Annex IV.1.ii	2	43	48	
SOE - EIONET State of Environment monitoring	36	479		
SUR - Surveillance monitoring	156	2355	299	543
TRE - Chemical trend assessment	17	282	43	168
UWW - Nutrient sensitive area under the Urban Waste Water Treatment Directive - WFD Annex IV.1.iv	2	312	20	3
Total sites irrespective of purpose	248	4669	536	1360

Source: WISE electronic reporting

In terms of surveillance monitoring, there was a decrease in the number of sites in most RBDs for all relevant water categories: 11 of the 14 RBDs with transitional waters, 10 of the 17 RBDs with rivers, 10 of the 16 RBDs with coastal waters and nine of the 14 RBDs with lakes. The largest decrease was in the Duero RBD where for the first RBMP there were 819 river sites used for surveillance, and the number decreased to 160 for the second RBMP. There are also RBDs with increased numbers of surveillance sites for the second RBMPs: two for coastal waters, four for lakes, six for rivers and one for transitional waters. The biggest increase was in the Andalusian Mediterranean Basins RBD where there were 48 sites for the first RBMPs and 130 for the second. There were similar decreases in the number of monitoring sites used for operational purposes: seven RBDs for coastal waters, seven RBDs for lakes, eight RBDs for rivers and nine RBDs for transitional waters. The Duero RBD again showed the largest decrease from 726 operational sites in rivers for the first RBMPs to 569 sites for the second. There were also increases in operational sites in some RBDs: three RBDs for coastal waters, three RBDs for lakes, seven RBDs for rivers and one RBD for transitional water. The largest increase was for rivers in the Jucar RBD from 101 for the first RBMPs to 262 for the second.

Figure 3.1 Percentage of water bodies included in surveillance and operational monitoring in Spain for the first RBMPs (2010) and second RBMPs (2016). Note no differentiation is made between water bodies included in ecological and/or chemical monitoring[14]



Source: WISE electronic reporting

Figure 3.1 shows the percentage of water bodies included in surveillance and operational monitoring in Spain for the first RBMPs and second RBMPs, while Figure 3.2 shows the share of water bodies in each ecological status/potential class that are included in surveillance monitoring.

In general in Spain, ecological monitoring is undertaken at more sites and in more water bodies than for chemical monitoring in all water categories.

Further information was obtained from three RBMPs. The RBMP for the Guadiana RBD reports that no changes have been undertaken in the surface water monitoring programmes. Hhowever, changes are in progress for the third RBMP.

The Guadalquivir RBMP explains that there are different reasons for the changes:

- The increase in the number of surveillance monitoring sites in lakes and reservoirs is due to the changes in their programmes. No further explanation is provided. However, it should be noted that the revised set of monitoring sites is not yet operational (it seems

[14] Spain subsequently clarified that the percentages for lakes in the second RBMPs should be 53 % for surveillance and 25 % for operational monitoring.

that it has been reported as basis for the second RBMP) and that the number of monitoring sites might still change.

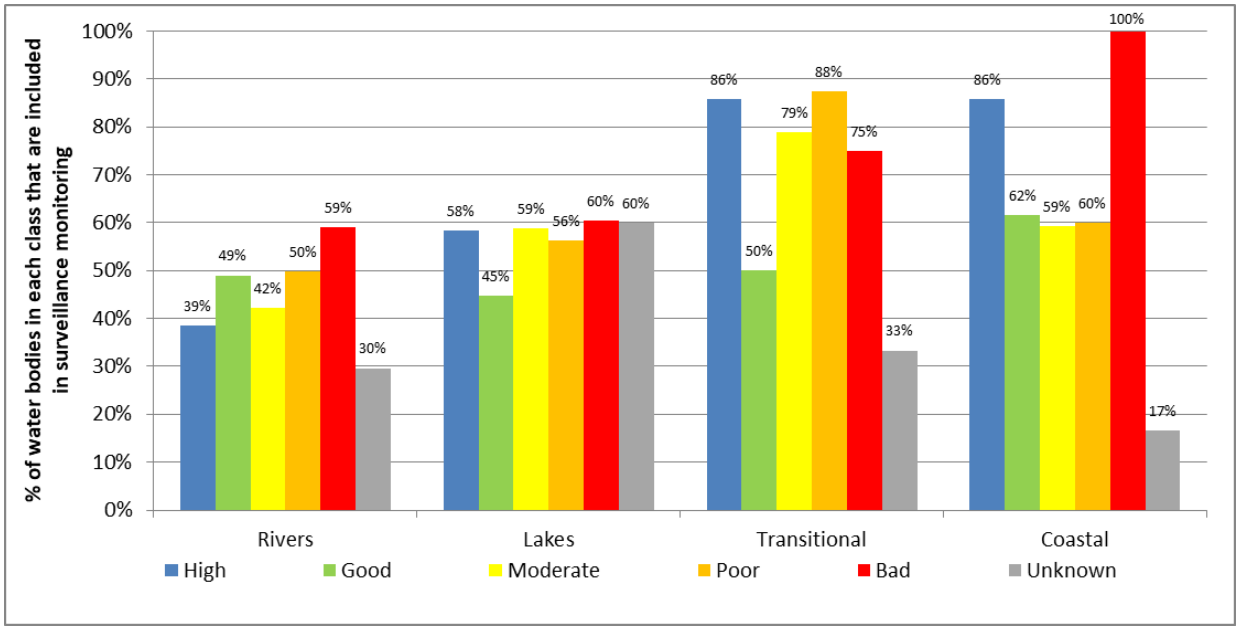
- Regarding the changes of the operational monitoring sites, an evaluation was carried out addressing i) location of the monitoring sites, ii) evaluation of the historical dataset to validate their continuity in the programme, iii) validation of non-compliance of the water body and thus continuity of the site in the programme, iv) review of water bodies in worse than good status (first RBMP) and new allocation of monitoring sites. In consequence, 21 monitoring sites have been incorporated from other monitoring programmes for water bodies in worse than good status, in addition to 22 new monitoring sites for water bodies in bad status in the first RBMP.

- Monitoring of fish under the Fresh Water Fish Directive[15] has been supressed.

Details obtained from the Ebro RBMP shows an overview table on the numerical changes in the different programmes, and does not provide any textual justification or explanation of changes, though a list of studies that have been carried out in the past year is attached (including fish behaviour studies, fish fauna studies, and ecological status studies in transitional waters). Note that the monitoring programmes for transitional waters in the Ebro RBD are only in an "experimental phase".

[15] Council Directive 78/659/EEC of 18 July 1978 on the quality of fresh waters needing protection or improvement in order to support fish life - Repealed by Directive 2006/44/EC.

Figure 3.2 Proportion of water bodies in each ecological status/potential class which are included in surveillance monitoring in Spain[16]



Source: WISE electronic reporting. A differentiated presentation between ecological status and potential and including all types of quality element can be viewed here - https://tableau.discomap.eea.europa.eu/t/Wateronline/views/WISE_SOW_QualityElement_Status_Compare/SWB_QualityElement_Group?iframeSizedToWindow=true&:embed=y&:display_count=no&:showAppBanner=false&:showVizHome=no

Quality elements monitored (excluding River Basin Specific Pollutants)

Table 3.3 illustrates the quality elements used for the monitoring of lakes and rivers for the second RBMPs: no differentiation is made between purposes of monitoring.

For the second RBMPs, there were still gaps in the expected biological quality elements to be included in monitoring for all water categories in at least some of the Spanish RBDs. For example, in the Galicia-Coast RBD only phytoplankton were monitored in coastal waters for the second RBMP. In three RBDs (Guadiana, Ebro, Catalan RBD), benthic invertebrates were monitored in coastal waters in the first RBMPs but were not reported as being monitored for the second[17]. On a more positive note, whereas for the first RBMP no biological quality elements were reported to be monitored in the Balearic Islands, for the second all expected biological quality elements were reported.

[16] Spain subsequently clarified that for coastal water, there are no water bodies included in surveillance monitoring that are classified as unknown.

[17] Spain subsequently clarified that benthic invertebrate are monitored in the Guadiana and Catalan RBDs. This must be a reporting error.

Table 3.3 Quality elements monitored for the second RBMPs in Spain (excluding River Basin Specific Pollutants). Note; quality element may be used for surveillance and/or operational monitoring

	Biological quality elements									Hydromorphological quality elements		
	Phytoplankton	Macrophytes	Phytobenthos	Benthic invertebrates	Fish	Angiosperms	Macroalgae	Other aquatic flora	Other species	Hydrological or tidal regime	Continuity conditions	Morphological conditions
Rivers	Yes	Yes	Yes	Yes	Yes			Yes	Yes	Yes	Yes	Yes
Lakes	Yes	Yes	Yes	Yes	Yes			No		Yes	Yes	Yes
Transitional	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes
Coastal	Yes	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes		Yes

	General physicochemical quality elements								
	Transparency conditions	Thermal conditions	Oxygenation conditions	Salinity conditions	Acidification status	Nitrogen conditions	Phosphorus Conditions	Silicate	Other determinand for nutrient conditions
Rivers	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Lakes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Transitional	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Coastal	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Source: WISE electronic reporting

In four RBDs, all expected biological quality elements were included in the monitoring of rivers for the second RBMPs: fish were reported not to be monitored any more in rivers in five RBDs. Though not an expected biological quality element for rivers, phytoplankton was monitored in 14 RBDs for the second RBMPs: in two RBDs phytoplankton had been monitored for the first RBMPs but not the second. There was an increase in the number of different biological quality elements monitored for the second in seven RBDs compared to the first.

Only one RBD (Eastern Cantabrian) reported for the second RBMP that all expected biological quality elements are monitored in transitional water. In all other 13 RBDs with transitional waters, fish were not monitored though fish were reported for three of these RBDs for the first RBMP. For six RBDs, fewer biological quality elements were monitored for the second RBMP compared to the first, and in four RBDs, an increase.

River Basin Specific Pollutants and matrices monitored

221 different River Basin Specific Pollutants were reported for Spain as a whole. Of these, 215 were monitored in water. Zinc, copper, fluoride, selenium and arsenic were monitored in all of the 14 RBDs which reported information, and in all water categories.

41 River Basin Specific Pollutants were reported to be monitored in biota including fish. Five substances (arsenic, selenium, zinc, copper and chromium) were monitored in four of the 14 RBDs that reported. Arsenic was monitored in biota in rivers and lakes; selenium, zinc, copper and chromium were also monitored in transitional waters.

64 different River Basin Specific Pollutants were reported to be monitored in sediment or settled sediment in nine of the 14 RBDs that reported. Five substances (arsenic, selenium, zinc, copper and chromium) were monitored in eight of the reported 14 RBDs, and they were monitored in all four water categories.

For River Basin Specific Pollutants, the WFD indicates that, the frequency of surveillance monitoring in water should be at least once every three months for one year during the RBMP cycle. The frequency for operational monitoring should be at least once every three months every year. Greater intervals can be applied provided they are justified on the basis of expert judgment or technical knowledge. In Spain, monitoring was performed at or above this minimum intra-annual frequencies of four times per year in many, but not all cases[18]. No explanation could be found for the reduced frequencies.

Minimum monitoring frequencies in biota are specified for the assessment of Priority Substances in Article 3(2)c of EQS Directive 2008/105/EC: this is once per year for operational and surveillance monitoring purposes, unless greater intervals can be justified on the basis of technical knowledge or expert judgment. It thus seems consistent to monitor River Basin Specific Pollutants at the same frequency in biota.

For two-thirds of the substances, the monitoring frequency in biota (fish and other biological matrices) was at least once per year at all sites where these substances were monitored. Every substance was sampled at least once per year at some of the sites. Around half of the substances monitored in sediment (settled and/or suspended) were monitored at least once per year at all sites where they were monitored and for two substances no sites met this frequency. No information could be found for the reduced frequencies.

[18] Spain subsequently stated that monitoring was performed at or above the minimum intra-annual frequencies in more than 70 % of the cases.

Table 3.4 ***Number of sites used to monitor River Basin Specific Pollutants as reported in the second RBMPs and non-priority specific pollutants and/or other national pollutants reported in the first RBMPs in Spain. Note the data from both cycles may not be fully comparable as different definitions were used and also not all Member States reported information at the site level meaning that there were no equivalent data for the first RBMPs***

RBMPs		Lakes	Rivers	Transitional	Coastal
first	Sites used to monitor non-priority specific pollutants and/or other national pollutants	150	2 817	382	670
second	Sites used to monitor River Basin Specific Pollutants	52	1 990	210	388

Sources: WISE electronic reporting

Surveillance monitoring of surface water bodies

Overall in the 16 RBDs with information for both cycles, there was a decrease in the proportion of water bodies included in surveillance monitoring in all four categories for the second RBMPs. The largest decrease of 28 % was in coastal and transitional waters. For operational monitoring there were increases in the proportion of coastal water and river water bodies monitored, no changes in lake water bodies and a decrease in the proportion of transitional water bodies. The largest increase of 19 % was for coastal water bodies.

In terms of the proportion of water bodies included in surveillance and operational monitoring for the second RBMPs, there were differences between the RBDs. For coastal waters in eight RBDs, a higher proportion of water bodies was used for surveillance than operational monitoring, in two RBDs a smaller proportion and in six RBDs the proportion was the same. In terms of lake water bodies the respective values were nine RBDs, two RBDs and three RBDs, respectively; for river water bodies, 10 RBDs, five RBDs and two RBDs, respectively; and, for transitional water bodies, eight RBDs, one RBD and five RBDs, respectively.

In terms of the proportion of river water bodies included in surveillance monitoring, there was an increase from the first to the second RBMPs in nine of the 16 RBDs with information for both cycles, and a decrease in the other 7. There were no changes from the first to the second RBMPs for around 50 % of RBDs for coastal and transitional waters. For lakes, there was a decrease in seven RBDs, an increase in six RBDs and no change in one RBD.

In terms of the proportion of river water bodies included in operational monitoring, in 10 of the 16 RBDs with information from both cycles there was an increase in the proportion of river water bodies included in operational monitoring from the first to the second RBMPs and a

decrease in the proportion in the other six RBDs. For the other water categories, there were RBDs where there were increases, decreases and no changes in the proportions used for operational monitoring in the different RBDs.

Any changes in monitored water bodies from the first to the second RBMPs have to be assessed in relation to changes in the delineation of water bodies. Generally there were relatively small changes in the numbers of identified water bodies in each category from the first to the second RBMPs. Of the 16 RBDs with information for both the first and second cycles, there were no changes in the numbers of coastal water bodies in 12 of the 14 RBDs, of lake water bodies in eight of the 14 RBDs, of river water bodies in seven of the 16 RBDs, and of transitional water bodies in 12 of the 14 RBDs. More rivers were identified than in any other water category, and in five RBDs there was an increase in numbers from the first to the second RBMPs in five RBDs and a decrease in 4.

All relevant quality elements should be monitored in a water body that is included in surveillance monitoring: relevancy is in relation to water category and biological, physicochemical and hydromorphological quality elements should be included. In Spain as a whole, all required physicochemical elements are monitored in 59 % of coastal water bodies included in surveillance monitoring, all required biological quality elements in 13 % of water bodies and all required hydromorphological quality elements in only 5 % of water bodies included in surveillance monitoring.

There are significant gaps in the monitoring of all required quality elements in all water bodies included in surveillance. The physicochemical quality elements are the closest type of quality element to full compliance, at best 59 % of river and coastal water bodies included in surveillance monitoring.

For the surveillance monitoring of lakes, only 5 % of water bodies have all the required biological quality elements included, 15 % of water bodies for the hydromorphological quality elements and 43 % of water bodies for the required physicochemical quality elements.

In rivers, the type of quality element with the largest proportion of water bodies where all the required quality elements are included in surveillance monitoring are the physicochemical quality elements (59 % of water bodies), followed by the biological quality elements (30 % of water bodies) and hydromorphological quality elements (11 % of water bodies).

There is a similar situation in transitional waters where 54 % of water bodies included in surveillance monitoring are monitored for all required physicochemical quality elements, 11 % for all required biological quality elements and none for all required hydromorphological quality elements.

In conclusion, there are significant gaps in the monitoring of all required quality elements in all water bodies included in surveillance monitoring. The physicochemical quality elements are the closest type of quality element to meet full compliance, at best 59 % of river and coastal water bodies.

Operational monitoring of surface water bodies.

For the second RBMPs the predominant biological quality element used in operational monitoring of coastal waters, lakes and transitional waters was phytoplankton (>90 % of water bodies included in operational monitoring) closely followed by benthic invertebrates in lakes and transitional waters: these are the two elements traditionally used in many European countries before the implementation of the WFD. All other relevant biological quality elements were also used for the operational monitoring of all four water categories including fish in lakes, rivers and transitional waters.

The information provided in the first RBMPs and reported to WISE regarding monitoring systems was not always fully consistent. In bilateral contacts with the Spanish authorites regarding the first RBMPs, it was concluded that the monitoring programmes were not being implemented as reported, as the information that had been reported was not accurate: it is, therefore, difficult to make comparisons from the first to the second RBMPs in terms of monitoring. In terms of the operational monitoring of surface waters, the data in WISE indicates a similar use of biological quality elements as had been reported for the second RBMPs.

Transboundary surface water body monitoring

71 transboundary surface water bodies were reported across five RBDs. All five RBDs had transboundary rivers, three RBDs transitional waters and two coastal waters: no transboundary lakes were reported. All five RBDs that reported transboundary surface water bodies also had monitoring sites/monitored water bodies that were part of international network of a river or sea convention or of an international network of other international convention: note not necessarily the transboundary water bodies. However, there were no transitional water bodies said to be included in international networks in the Eastern Cantabrian and Guadiana RBDs

even though they had reported transboundary water bodies in this category[19]. The Jucar RBD also reported some water bodies that were included in a sea convention network.

Use of monitoring results for classification

The majority of water bodies are classified based on monitoring at the quality element level, which is a huge improvement for the second RBMPs. However, very few water bodies are classified for macrophytes and fish. Fish and hydromorphological quality elements are rarely classified in lakes, and not at all in transitional and coastal waters.

For Spain as a whole, overwhelmingly monitoring results were used in the classification of biological quality elements in coastal water: the biological quality elements most often used in the classification of ecological status/potential was phytoplankton followed by benthic invertebrates: macroalgae were only used in the classification of 32 % of coastal water bodies and angiosperms 20 %. Monitoring was predominately used in the classification of general physicochemical quality element and River Basin Specific Pollutants and expert judgment was only used in the classification of 6 % of coastal water bodies. Grouping was only used for one coastal water body for phytoplankton, some physicochemical quality elements and River Basin Specific Pollutants.

For lakes, also the classification of biological quality elements was mainly based on monitoring results with a higher proportion (around 10 %) of water bodies classified by expert judgment: grouping was not used in lakes. Fish were reported to be monitored in 4 % of lakes but the results were not used in the classification. The Common Implementation Strategy Working Group on Ecological Status has accepted Spain's justification for not developing an ecological status assessment method for fish in lakes.

Phytoplankton was the most frequently classified biological quality element in lakes (48 % of classified lakes). Monitoring results were mainly used in the classification of the physicochemical quality elements though again expert judgment was used to classify around 10 % of water bodies some physiochemical quality elements.

The most frequently biological quality elements used to classify rivers was benthic invertebrates (72 %) followed by phytobenthos (48 %), fish were only used for 9 % of rivers.

[19] Spain subsequently stated that in the Guadiana RBD, the assessment is made in coordination with Portugal and there is an ongoing project to establish a coordinated monitoring and assessment of the transboundary water bodies in Miño, Duero, Tagus and Guadiana. In the Eastern Cantabrian, there have been some exchanges of information with France regarding the monitoring networks, and further work will be done.

Again, monitoring results were mainly used to classify individual quality elements though expert judgement (~5 %) and grouping (~2 %) was used. Rivers were classified according to the hydromorphological quality elements with morphological conditions being used for the most river water bodies (60 % of total) with most classified by monitoring results (45 %), expert judgment (12 %) and grouping (~3 %). Monitoring results were mainly used to classify river water bodies according to the physicochemical quality elements (~60 %), followed by expert judgment (~13 %) and by grouping (~3 %).

Again for transitional waters, monitoring results are mainly used to classify the individual quality elements with only very few classified by expert judgment or by grouping: the exception was morphological conditions which was the only quality elements of this type used to classify transitional waters by expert judgment but in only 8 % of water bodies.

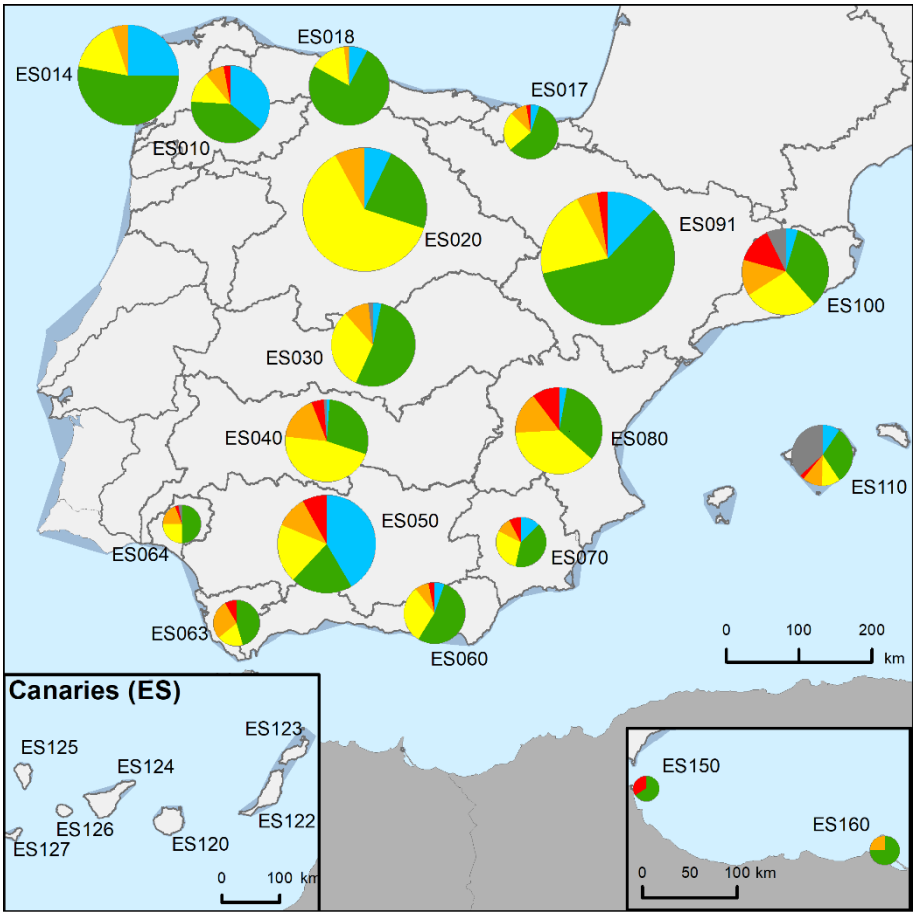
Overall in Spain, there were differences between water categories in the proportion of water bodies classified according to the different types of quality elements. In terms of biological quality elements 82 % of those rivers classified (i.e. those that had a reported overall ecological status/potential), 75 % of coastal waters, 66 % of lakes and 55 % of transitional waters were classified according to these elements. For physicochemical quality elements, 85 % of rivers, 63 % of lakes, 60 % of coastal water and 48 % of transitional water bodies were classified using these elements. The equivalent values for the hydromorphological quality elements were 66 % of rivers, 30 % of lakes, 8 % of transitional waters and 7 % of coastal water bodies. In terms of those water bodies with a reported overall ecological status/potential, 58 % of rivers, 43 % of transitional waters, 35 % of coastal waters and 31 % of lakes were also classified according to River Basin Specific Pollutants.

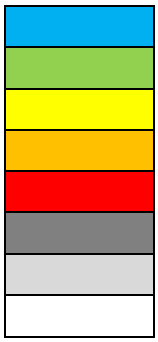
Generally, when more than one quality element within the three main types (biological, physicochemical, hydromorphological) was used in the classification, it was in terms of the physicochemical quality elements. For example, five different physicochemical quality elements were used for 33 % of river water bodies whereas 39 % of river water bodies were classified using two different biological quality elements. This was also the case for coastal, lakes and transitional waters. The classification of water bodies using the hydromorphological was based on just one element in coastal waters, lakes and transitional waters: in rivers the classification of 50 % of classified water bodies was based on one element, 4 % on two elements and three for 12 % of water bodies.

3.1.2 Ecological Status/potential of surface water

The ecological status/potential of surface water bodies in Spain for the second RBMPs is illustrated in Map 3.1. This is based on the most recent assessment of status. Almost all water bodies have been classified for ecological status or potential (5015 out of 5122 surface water bodies in the 18 RBD reporting their second RBMPs). Most water bodies are classified with high or medium confidence, which is a great improvement since the first RBMPs.

Map 3.1 ***Ecological status or potential of surface water bodies in Spain based on the most recently assessed status/potential of the surface water bodies***





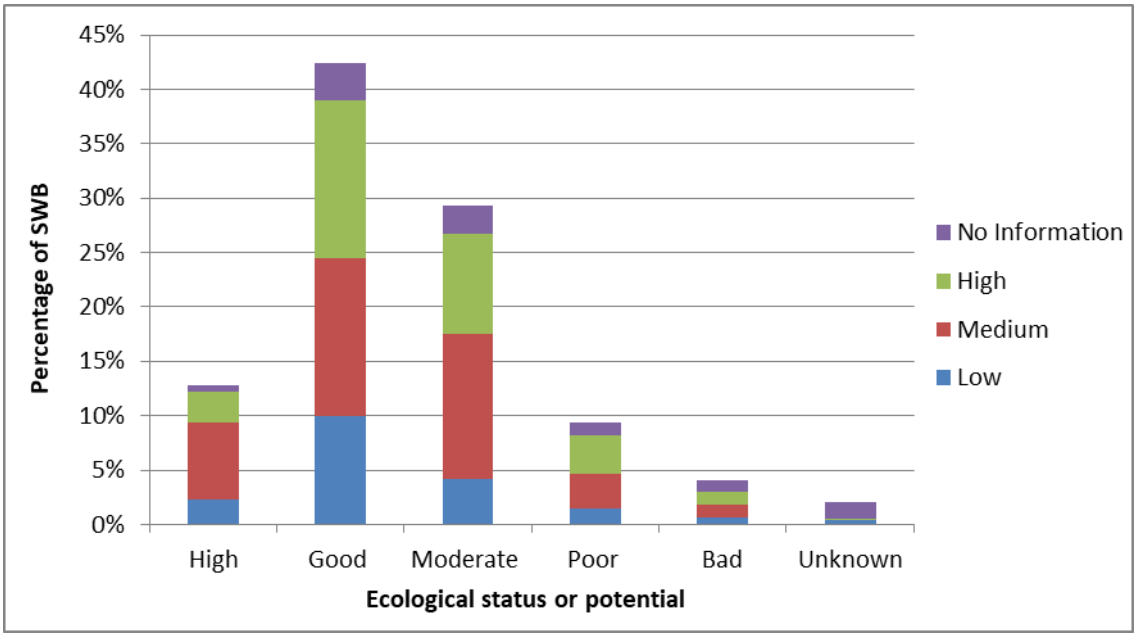
High
Good
Moderate
Poor
Bad
Unknown
River Basin Districts
Countries outside the European Union

Note: Standard colours based on WFD Annex V, Article 1.4.2(i).
Source: WISE, Eurostat (country borders)

A differentiated presentation of this data between ecological status and potential and including all types of quality element can be viewed here - https://tableau.discomap.eea.europa.eu/t/Wateronline/views/WISE_SOW_QualityElement_Status_Compare/SWB_QualityElement_Group?iframeSizedToWindow=true&:embed=y&:display_count=no&:showAppBanner=false&:showVizHome=no

Figure 3.3 shows the confidence in the classification of ecological status/potential.

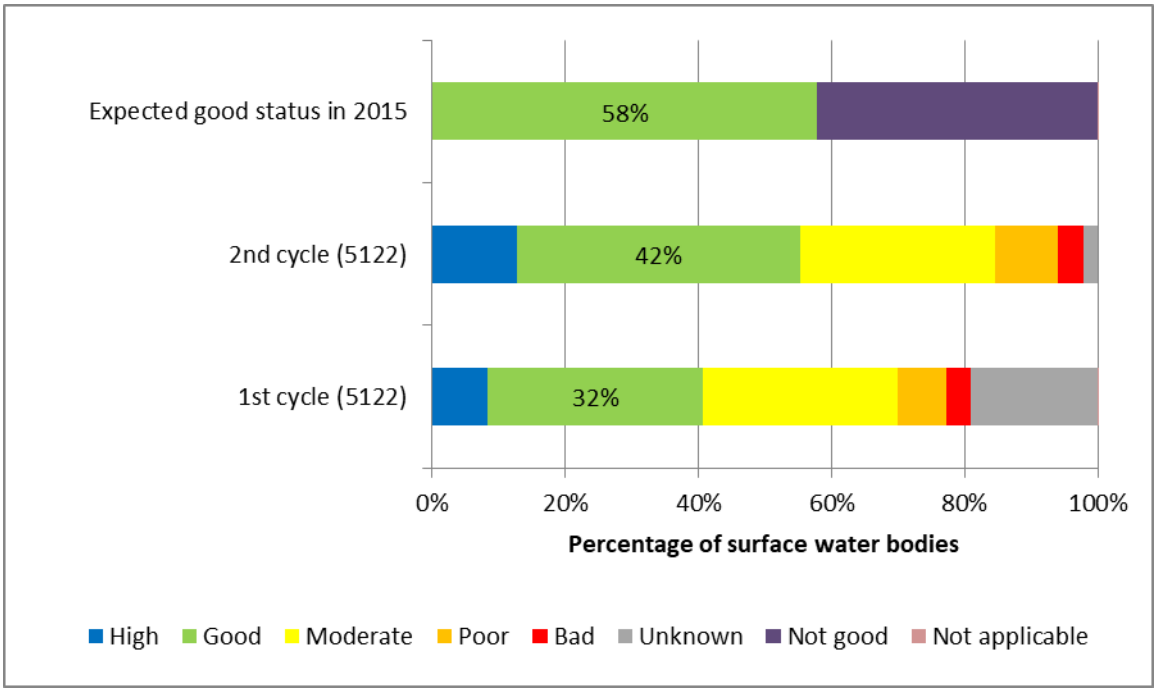
Figure 3.3 Confidence in the classification of ecological status or potential of surface water bodies in Spain based on the most recently assessed status/potential



Source: WISE electronic reporting

Figure 3.4 compares the ecological status of surface water bodies in Spain for the first RBMPs with that for the second (based on the most recent assessment of status/potential) and that expected by 2015.

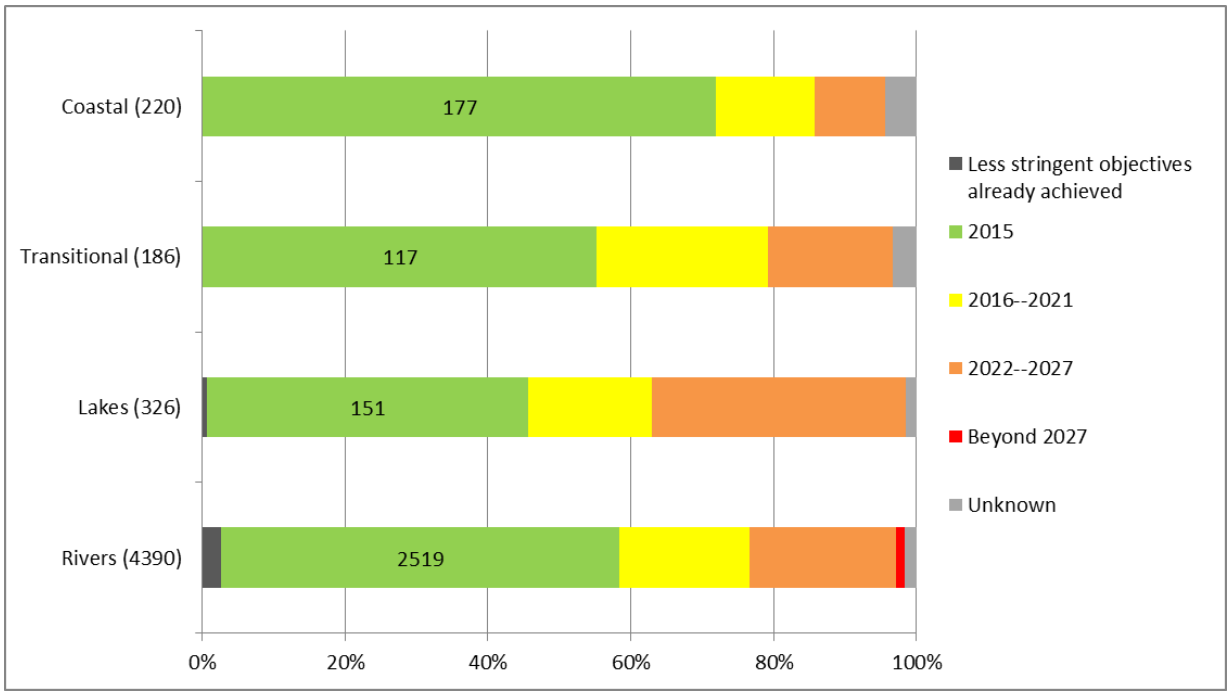
Figure 3.4 ***Ecological status or potential of surface water bodies in Spain for the second RBMPs, for the first RBMPs and expected in 2015. The number in the parenthesis is the number of surface water bodies for both cycles. Note the period of the assessment of status for the second RBMPs was 2003 to 2014. The year of the assessment of status for first RBMPs is not known***



Source: WISE electronic reporting

Member States were asked to report the expected date for the achievement of good ecological status/potential. The information for Spain is shown in Figure 3.5.

Figure 3.5 ***Expected date of achievement of good ecological status/potential of surface water bodies in Spain. The number in the parenthesis is the number of water bodies in each category***



Source: WISE electronic reporting

Classification of ecological status in terms of each classified quality element

The classification is more often based on several quality elements in all water categories than was the case for the first RBMPs, although for many lakes and coastal water bodies, the assessment is still based on phytoplankton and nutrients. Most of the rivers are assessed using only two biological quality elements: phytobenthos and benthic invertebrates.

The overall ecological status has not improved much since the first RBMPs. There are some water bodies with improved status for some quality elements, but others with deterioration of some quality elements. The reasons for this lack of improvement are not clear.

The assessment of the RBMP and background documents for Guadiana RBD indicates that the status classification is based on monitoring data for 2008-2011 (however, not all monitoring sites have annual data available, thus the latest available data have been used), except for transitional and coastal water bodies where 2011 monitoring data have only been used. The RBMP does not provide any explanation or justification of changes; it only includes overview tables.

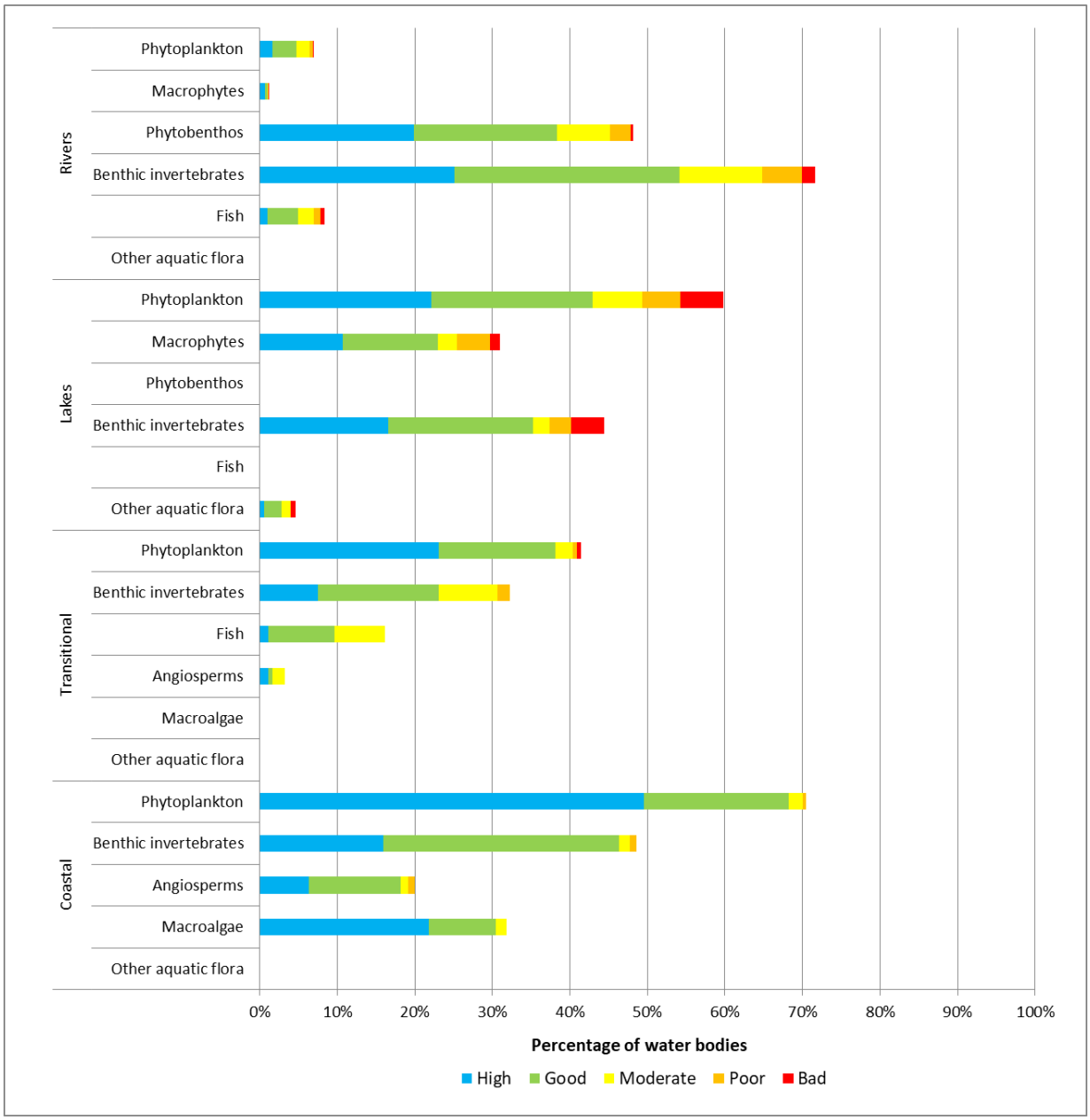
The Guadalquivir RBMP explains that changes are due to the following reasons: 1) effectiveness assessment of the Programme of Measures for the first RBMPs. However, the RBMP informs that the majority of the measures have not been implemented yet, and that the main type of implemented measures so far is urban waste water treatment works. 2) Latest available data from the physicochemical monitoring from 2009. 3) Review of ecotypes of water bodies. There is however, no information on the different effects of these three points.

The Ebro RBMP provides a table that shows the differences in the quality elements used for status classification. However, no further explanation is provided beyond a small text reference to different studies carried out during the previous planning cycle. An overview table is provided for the evolution of the status classification between 2009 and 2013, and Table 3.2 provides details on the justification for those water bodies whose status has worsened, including: a) new indicators; b) natural variation; c) improved datasets.

The overall classification of the ecological status/potential of water bodies in Spain seems to be largely based on biological quality elements (not necessarily all relevant quality elements) and general physicochemical quality elements: the role of the hydromorphological quality elements plays a very limited role in the classification. In addition, 11 % of classified lake water bodies, 10 % of river water bodies and 5 % of transitional water bodies are classified using no biological quality elements. 54 % of classified transitional waters, 37 % of classified rivers, 26 % of classified lakes and 26 % of classified coastal water bodies are classified using only one biological quality element. This is inconsistent with the requirements of the WFD and calls into question the validity of the assessment/classification of status of surface water bodies in Spain.[20]

[20] Spain subsequently clarified that 4 % of classified lake water bodies, 6 % of river water bodies and 1 % of transitional water bodies are classified using no biological quality elements, and that 42 % of classified transitional waters, 38 % of classified rivers, 27 % of classified lakes and 23 % of classified coastal water bodies are classified using only 1 biological quality element.

Figure 3.6 Ecological status/potential of the biological quality elements used in the classification of surface waters in Spain. Note that water bodies with unknown status/potential or those where the quality element was reported as not applicable or monitored but not used for classification are not presented.

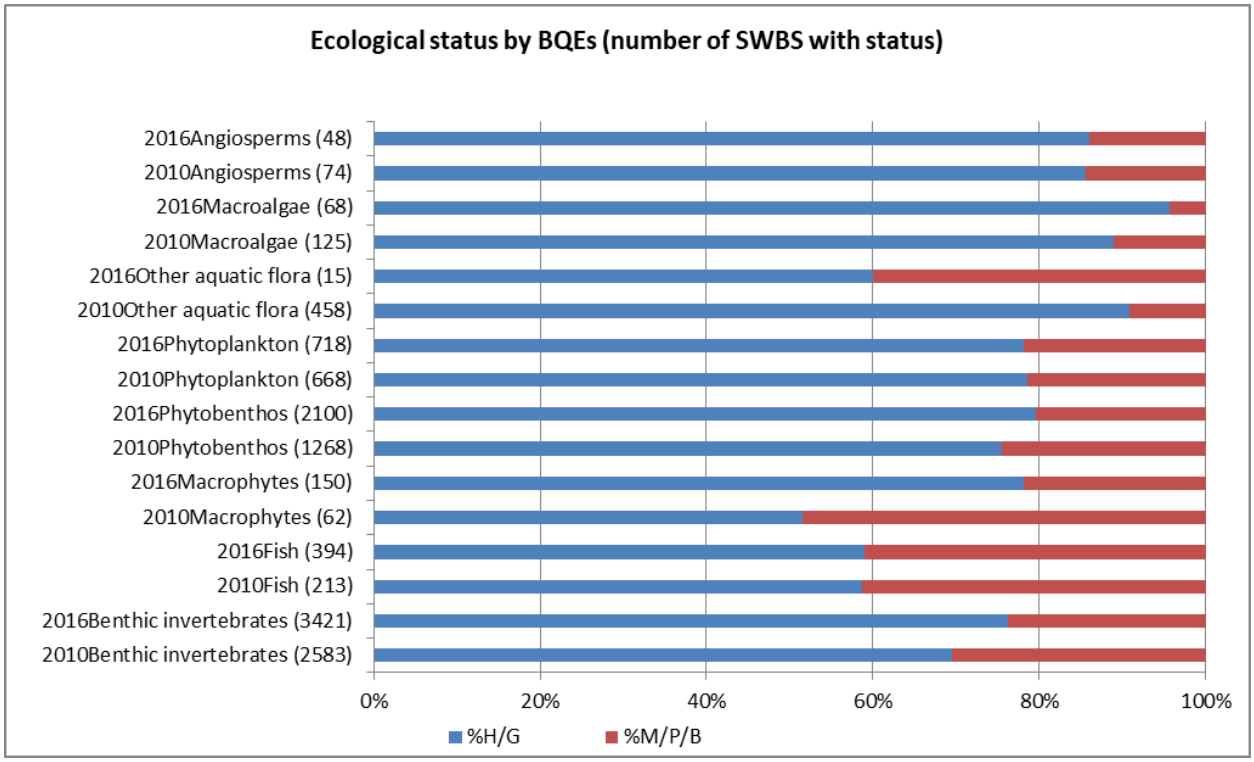


Source: WISE electronic reporting. A differentiated presentation of this data between ecological status and potential and including all types of quality element can be viewed here - https://tableau.discomap.eea.europa.eu/t/Wateronline/views/WISE_SOW_QualityElement_Status_Compare/SWB_QualityElement_Group?iframeSizedToWindow=true&:embed=y&:display_count=no&:showAppBanner=false&:showVizHome=no

Figure 3.7 compares the classification of biological quality elements in terms of ecological status/potential for the two cycles. It should be noted that this comparison should be treated

with some caution as there are differences between the numbers of surface water bodies classified for individual elements from the first to the second RBMPs.

Figure 3.7 Comparison of ecological status/potential in Spain according to classified biological quality elements in rivers and lakes from the first to the second RBMPs[21]



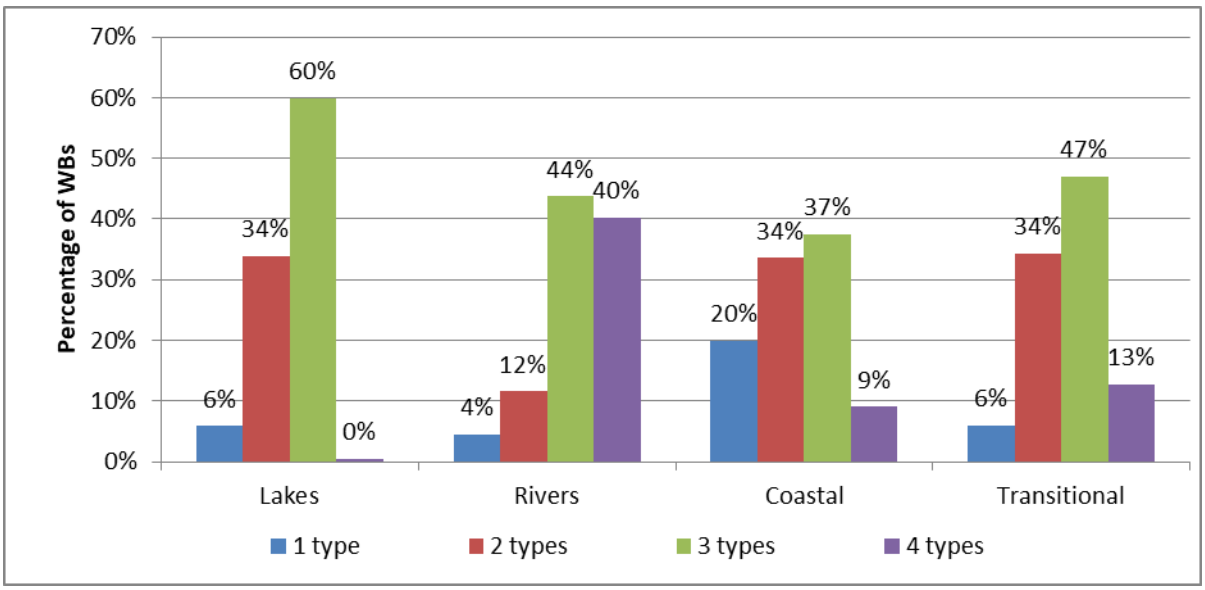
Source: Surface water bodies: Quality element status
https://tableau.discomap.eea.europa.eu/t/Wateronline/views/WISE_SOW_QualityElement/SWB_QualityElement?:embed=y&:display_count=no&:showAppBanner=false&:showShareOptions=true&:showVizHome=no

Figure 3.8 and Figure 3.9 illustrate the basis of the classification of ecological status/potential of rivers and lakes in Spain for the second RBMPs.

[21] Spain subsequently clarified that the values shown in parentheses for the second RBMPs should be: Angiosperms (50); Macroalgae (70); Other aquatic flora (15); Phytoplankton (731); Phytobenthos (2115); Macrophytes (151); Fish (397); Benthic invertebrates (3459).

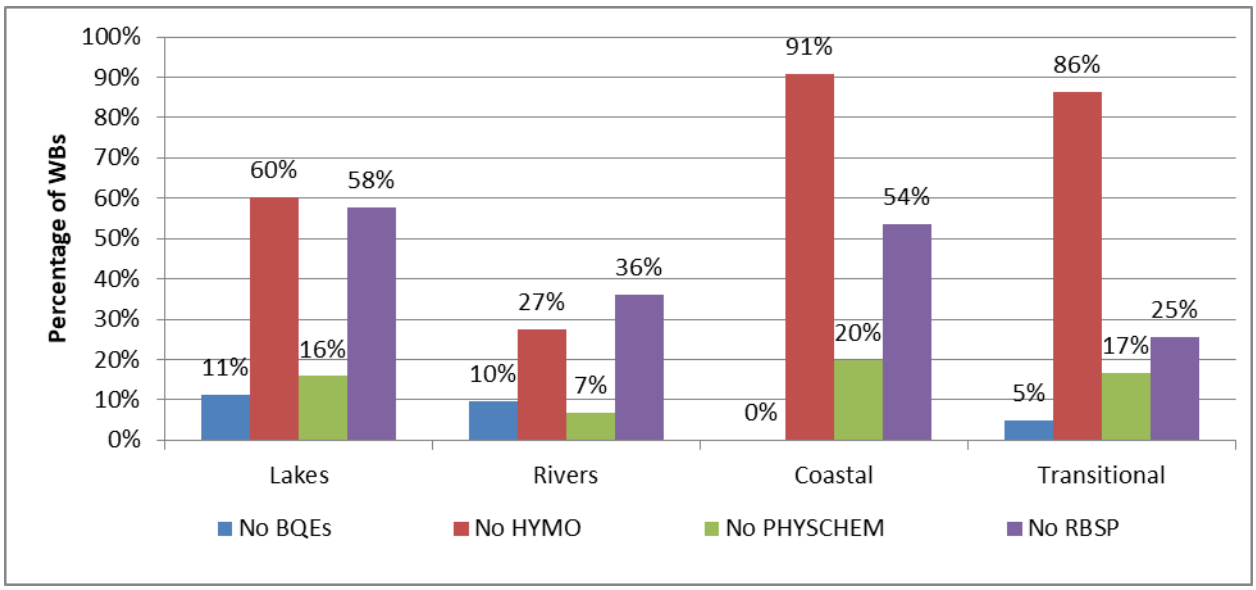
Figure 3.8 ***The classification of the ecological status or potential of rivers and lakes in Spain using 1, 2, 3 or 4 types of quality element***

Note: The 4 types are: biological; hydromorphological, general physicochemical and River Basin Specific Pollutants.



Source: WISE electronic reporting

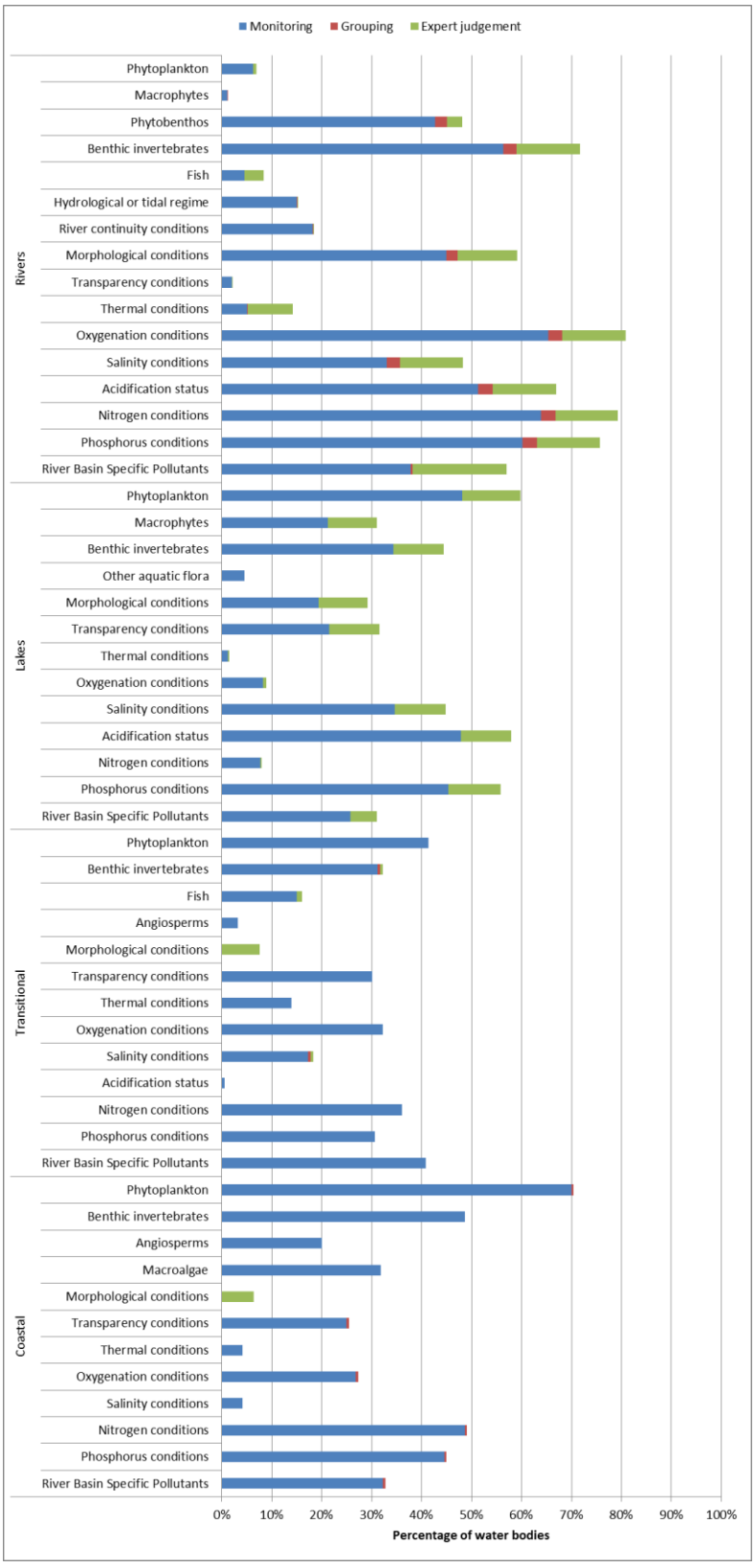
Figure 3.9 ***The percentage of river and lake water bodies in Spain where no biological quality element or no hydromorphological (HYMO) or no general physicochemical (PHYSCHEM) or no river basin specific pollutant (RBSP) has been used in the classification of ecological status or potential***

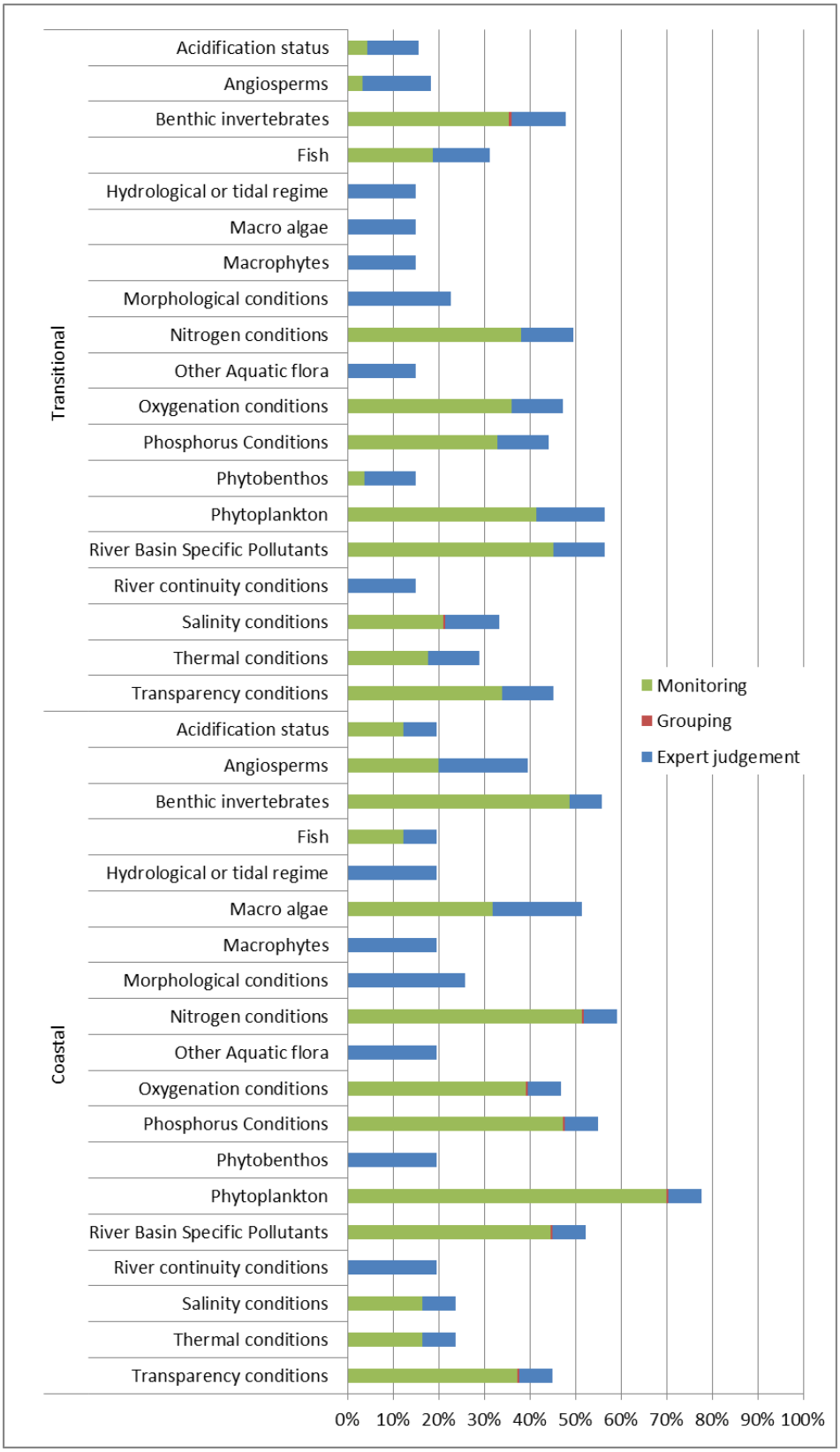


Source: WISE electronic reporting

The classification of the individual quality elements is illustrated in Figure 3.10.

Figure 3.10 Basis of the classification of ecological status/potential in Spain





Source: WISE electronic reporting

Assessment methods and classification of biological quality elements

For the second RBMPs, there are now assessment methods developed for all relevant biological quality elements missing for the first RBMPs, except macroalgae and angiosperms in coastal and transitional waters, and fish in lakes and transitional waters. It should be noted that the Common Implementation Strategy Working Group on Ecological Status has accepted Spain's justification for not developing an ecological status assessment method for fish in lakes. Macrophytes in rivers are reported for the Ebro RBD, but not for the other RBDs, and are not used for classification of any water body. There are still no classification of macroalgae and angiosperms in coastal and transitional waters.

The assessment of the RBMP and background documents for Guadiana RBD does not have information on the changes in the biological quality assessments methods between the first and second cycles. The RBMP explains that the biological quality elements used are different from those for the first planning cycle because of: 1) changes in the legislation, 2) availability of budget, 3) knowledge evolution of water bodies. None of the three aspects has been further clarified. The Guadalquivir RBMP does not have any relevant information. The Ebro RBMP lists the changes in an overview table: for rivers a method has been developed for fish, for lakes, phytoplankton, macrophytes, phytobenthos, and benthic invertebrates; for transitional waters for phytoplankton, benthic invertebrates and fish, and for coastal waters for no biological quality element. Similar to the information on monitoring, it has only experimental character so far; and it remains unclear if the methods are finalised.

Intercalibration of biological assessment methods and national classification systems

Many national types are linked to the common intercalibration types, but it is not clear which biological quality element methods have been intercalibrated.

Some national types are not linked to common intercalibration types, in particular lakes and transitional waters. Some national river types are linked to several common intercalibration types. It is not clear how reference conditions and class boundaries have been set for the non-linked types, and for the river types linked to several common intercalibration types.

The RBMPs and background documents assessed contained no information on how the class boundaries have been set for national types not linked to the common intercalibration types.

Assessment methods for hydromorphological quality elements

The hydromorphological quality elements have been used for the classification of rivers in 11 RBDs, of lakes in only two RBDs and for coastal waters and transitional waters in only one RBD.

The classification boundaries for supporting hydromorphological quality elements were reported to be related to the class boundaries for the sensitive biological quality elements in rivers, lakes and transitional waters in some but not all RBDs. Only one RBD reported this information for hydromorphological quality elements in coastal waters and indicated that the boundaries were related to sensitive biological quality elements.

The assessment of selected RBMPs and background documents indicated that the hydrological regime was only used for classifying high status in the details obtained from the Guadiana RBMP, and ecological flows have not been assessed. No information on changes since the first RBMPs in this respect was provided in the Guadiana RBMP nor in the Guadalquivir RBMP. The Ebro RBMP indicates that hydromorphological quality elements have been used for lakes and transitional waters for the second RBMPs, when they had not in the first.

Assessment methods for general physicochemical quality elements

Standards are reported for nutrients in all water categories and are reported to be consistent with the good-moderate status boundary of the relevant sensitive biological quality elements. However, many of them appear not to be sufficiently stringent to be compatible with the classification boundary. No direct references to these aspects have been found in any of the three RBMPs assessed.

Some standards for physicochemical quality elements are type-specific; others are reported as quite broad ranges for a range of types. There may also be some reporting errors in terms of values of the standards and the units used.

The basis for stating compatibility with the sensitive biological quality elements should be further investigated.

The sensitivity of the biological quality elements assessment methods to different impacts have been reported, and seem logical in that they are sensitive to all significant impacts.

Selection of River Basin Specific Pollutants and use of Environmental Quality Standards

The assessment of RBMPs and background documents did not find any information on how the River Basin Specific Pollutants have been identified[22].

Overall in Spain, Environmental Quality Standards are reported for 95 different River Basin Specific Pollutants (including both organic pollutants and metals). However 221 different River Basin Specific Pollutants were reported to be monitored: it seems that some substances were monitored but they couldn't be taken into account in the assessment of status, in the absence of a corresponding environmental quality standard.

Standards are set for 93 substances in water, six substances in biota (fish) and nine substances in settled sediment. Overall, Spain reported 456 Environmental Quality Standards (corresponding to standards in different matrices, different water categories, etc.., in 18 RBDs).

The 2011 Technical Guidance Document No 27[23] was used to set 87 % of the standards. The analytical methods used met the minimum performance criteria laid down in Article 4.1 of the QA/QC Directive (2009/90/EC[24]) for 92 % of the standards. For 5 % of the standards, Spain used the best available analytical techniques not entailing excessive costs, in accordance with Article 4.2 of the same Directive.

River Basin Pollutants were reported to be classified in 2867 surface water bodies. In 69 % of the cases this classification was based on monitoring results. However, the status of River Basin Specific Pollutant was reported in only 2749 surface water bodies, and the reporting seems therefore incomplete. 4 % (109) of these water bodies were of less than good status/potential because of River Basin Specific Pollutants.

Member States also reported the individual River Basin Specific Pollutants causing failure of objectives: Spain reported that 29 substances (from 13 RBDs) were causing failure in 191 surface water bodies. Selenium was reported to be causing failure in the most surface water bodies (45 or 0.9 % of surface water bodies in Spain), followed by zinc (33 surface water

[22] Spain indicated that this list contains substances identified under the Directive 76/464/EEC on pollution caused by certain dangerous substances discharged into the aquatic environment of the Community (now repealed). Substances in Annex VIII of the WFD were also considered as possible river basin specific pollutants, on the basis of the standards set under Directive 76/464/EC.

[23] https://circabc.europa.eu/sd/a/0cc3581b-5f65-4b6f-91c6-433a1e947838/TGD-EQS%20CIS-WFD%2027%20EC%202011.pdf.

[24] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:201:0036:0038:EN:PDF.

bodies), phosphate (29 surface water bodies), 4-nonylphenol, branched (29 surface water bodies and copper (17 surface water bodies).

There is contradictory information on the number of water bodies with at least one River Basin Specific Pollutant causing failure (129 versus 109) – this may be partly due to the incomplete reporting highlighted above.

Although environmental quality standards have been set for many river basin specific pollutants, these river basin specific pollutants are causing failure in very few water bodies. It should be noted that River Basin Specific Pollutants are classified in only 30 to 60 % of the waterbodies depending on the water category. This may partly explain the low number of water bodies failing because of these substances. In addition, it is not clear how far the current list of river basin specific pollutants is related to the pressures on the water bodies. Finally the fact that some of the environmental quality standards were not set according to the EU guideline might also mean some of the exceedances are overlooked[25].

Overall classification of ecological status (one-out, all-out principle)

Spain reported that the one-out, all-out principle has been used in all RBDs.

The assessment of RBMPs and background documents did not find any relevant information on how the no-deterioration principle has been applied, nor how spatial variability within water bodies has been dealt with.

3.2 Main changes in implementation and compliance since the first RBMPs

3.2.1 Monitoring of ecological status/potential

In terms of surveillance monitoring, there was a decrease in the numbers of sites in most RBDs for all relevant water categories. The biggest decrease was in the Duero RBD where for the first RBMPs, there were 819 river sites used for surveillance; the number decreased to 160 for the second RBMPs. There also RBDs with increased numbers of surveillance sites for the second RBMPs: the largest increase was in the Andalusian Mediterranean Basins RBD where there were 48 sites in the first RBMPs and 130 in the second.

[25] Spain subsequently explained that a new regulation has been adopted in September 2015, establishing new criteria to monitor and assess ecological status. This regulation includes the criteria to derive environmental quality standards for River Basin Specific Pollutants, and these criteria take into account the EU CIS Guidance Document. These will be used as a basis for the preparation of the third RBMP.

Overall for the 18 RBDs that have reported their second RBMPs in Spain, there was a 39 % reduction in the number of surveillance sites between the first RBMPs (5529 sites) and the second (3353 sites). There was a smaller reduction (18 %) in the numbers of operational sites between the two periods, 3362 for the first RBMPs and 2753 for the second. The ratio between surveillance and operational sites was 1:6 for the first RBMPs and 1:2 for the second indicating that there had been a proportionally larger reduction in surveillance compared to operational sites[26].

There were still gaps in the expected biological quality elements to be included in monitoring for all water categories in at least some of the RBDs in Spain for the second RBMPs. For example, in the Galicia-Coast RBD only phytoplankton were reported to be monitored in coastal waters for the second RBMPs. In three RBDs (Guadiana, Ebro and the Catalan RBDs), benthic invertebrates were monitored in coastal waters for the first RBMPs but were not reported as being monitored for the second[27]. On a more positive note, whereas for the first RBMPs no biological quality elements were reported to be monitored in the Balearic Islands RBD, for the second all expected biological quality elements were reported.

For the second RBMPs, all expected biological quality elements were included in the monitoring of rivers in four RBDs. Also in five RBDs fish were reported not to be monitored anymore in rivers for the second RBMPs. Though not an expected biological quality element for rivers, phytoplankton was monitored in 14 RBDs for the second RBMPs: many of these are reservoirs that used to be rivers (phytoplankton would be expected to be monitored in reservoirs). In two RBDs phytoplankton had been monitored for the first RBMPs but not for the second. There was an increase in the number of different biological quality elements monitored for the second RBMPs in seven RBDs compared to the first.

Only the Eastern Cantabria RBD reported for the second RBMPs that all expected biological quality elements are monitored in transitional water. In all other 13 RBDs with transitional waters, fish were not monitored though fish were reported for three of these RBDs for the first RBMPs. For six RBDs it was reported for the second RBMPs that fewer biological quality elements were monitored compared to the first, and in four RBDs, an increase was reported.

There was increase in nine of the 16 RBDs with information for both cycles in the proportion of rivers included in surveillance monitoring, and a decrease in the other seven RBDs. There

[26] Spain subsequently stated that the changes in the monitoring programme are due to better assessment of pressure and impacts for surface water and to broader experience in the collection of data for groundwater.

[27] Spain subsequently clarified that benthic invertebrate are monitored in the Guadiana and Catalan RBDs. This must be a reporting error.

were no changes from the first to the second RBMPs for around 50 % of RBDs for coastal and transitional waters in the proportion of water bodies included in surveillance monitoring. For lakes there was a decrease in seven RBDs, an increase in six RBDs and no change in one RBD.

In 10 of the 16 RBDs with information from both cycles, there was an increase in the proportion of river water body included in operational monitoring from the first to the second RBMPs and a decrease in the proportion in the other six RBDs. For the other water categories, there were RBDs where there were increases, decreases and no changes in the proportions used for operational monitoring in the different RBDs.

Any changes in monitored water bodies from the first to the second RBMPs have to be assessed in relation to changes in the delineation of water bodies. Generally, there were relatively small changes in the numbers of identified water bodies in each category from the first to the second RBMPs. Of the 16 RBDs with information for both cycles, there were no changes in the numbers of coastal waters in 12 of the 14 RBDs, of lakes in eight of the 14 RBDs, of rivers in seven of the 16 RBDs, and of transitional waters in 12 of the 14 RBDs. More rivers were identified than in any other water category, and in five RBDs there was an increase in numbers from the first to the second RBMPs in five RBDs and a decrease in 4.

For the second RBMPs the predominant biological quality elements used in operational monitoring of coastal waters, lakes and transitional waters was phytoplankton (>90 % of water bodies included in operational monitoring) closely followed by benthic invertebrates in lakes and transitional waters: these are the two elements traditionally used in many European countries before the implementation of the WFD. All other relevant biological quality elements were also used for the operational monitoring of all four water categories including fish in lakes, rivers and transitional waters.

The information provided in the first RBMPs and reported to the Water information System for Europe in the first RBMPs regarding monitoring systems was not always fully consistent. In bilateral contacts with the Spanish authorites regarding the first RBMPs, it was concluded that monitoring programmes were not being implemented as reported, as the information that had been reported was not accurate: it is, therefore, difficult to make comparisons between the two cycles in terms of monitoring. In terms of the operational monitoring of surface waters, the data in WISE indicates a similar use of biological quality elements as had been reported for the second RBMPs.

3.2.2 Ecological Status/potential of surface waters

For Spain as a whole, the proportion of water bodies with unknown status/potential has decreased from 20 % to 2 % for rivers and lakes and from around 15 % to 5 % for coastal and transitional waters from the first to the second RBMPs (EEA State of Water Report). The confidence in ecological status classification has changed from 40 % to 70 % for river and lake water bodies classified with high or medium confidence from the first to the second RBMPs. For transitional and coastal waters the proportion classified with high or medium confidence has changed from one third to two thirds from the first to the second RBMPs. Reported information about confidence has increased from 60 % to 90 % for rivers and lakes and from 40 % to 70-80 % for transitional and coastal waters.

The classification is based on more comprehensive classification methods that consider more of the relevant biological quality elements, e.g. fish and phytoplankton in rivers, and some hydromorphological and physicochemical quality elements.

The overall ecological status is reported as worse in the second RBMPs than in the first for coastal water bodies, mainly due to changes in the monitoring and classification methods. For lakes, rivers and transitional waters there was an increase in the proportion of waters at good or better status/potential from the first to the second RBMPs. However, some changes at the quality element level are reported to be consistent (to the worse or to the better status class).

3.3 Progress with Commission recommendations

- Recommendation: *Ensure the completion as soon as possible of the framework for status assessment considering the following: Translate the results of the intercalibration exercise to the assessment systems in a transparent way.*

  Assessment: Many but not all national types are linked to the common intercalibration types, but it is not clear which biological quality element methods have been intercalibrated, and how the class boundaries have been set for national types not linked to the common intercalibration types. No information on this has been found in the assessed RBMPs. In conclusion, limited progress has been made and this recommendation is not fulfilled.

- Recommendation: *The identification of river basin specific pollutants needs to be more transparent, with clear information on how pollutants were selected, how and where they were monitored, where there are exceedances and how such exceedances have*

been taken into account in the assessment of ecological status. It is important that there is an ambitious approach to combating chemical pollution and adequate measures are put in place.

Assessment: No information on the selection of River Basin Specific Pollutants could be found in the RBMPs and background documents. The CIS Guidance Document No 27 was used to derive most but not all of the environmental quality standards set. Detailed information was reported on which substances were causing failure in which water body, but this information seems sometimes inconsistent, or at least incomplete. The one-out-all-out principle has been applied in all RBDs. This recommendation has been partly fulfilled.

- Recommendation: *Ensure the completion as soon as possible of the framework for status assessment considering the following: Fill the gaps in assessment systems for biological quality and supporting elements, in particular for fish.*

  Assessment: Fish are now monitored in rivers (19 % of total river water bodies), transitional waters (8 %) and lakes (4 %). Fish is the quality element monitored in the fewest water bodies, for example in rivers benthic invertebrates are monitored in 63 % of river water bodies. There are no reliable data from the first RBMPs to make comparisons between the two cycles. However, for the second RBMPs there are still significant gaps in the expected quality elements to be included in monitoring for all water categories in at least some of the RBDs in Spain. For example, hydromorphological quality elements are only monitored to a limited extent in coastal, lake and transitional waters. However, Spain has made some progress with this recommendation in terms of monitoring.

  Reference conditions and class boundaries have now been set for all biological quality elements in rivers, including fish in the Ebro RBD, which was not fully developed in the first RBMPs. The fish metric adopted is the EFI+ index, which is supposed to respond to impacts of many pressures, including habitat alterations caused by hydromorphological pressures. Methods for fish in rivers were also reported for two other RBD but not in the other three RBDs which had reported on methods for fish. Three RBD reported a method for fish in transitional waters; no methods were reported for fish in lakes in any RBD. It should be however noted that the Common Implementation Strategy Working Group on Ecological Status has accepted Spain's justification for not developing an ecological status assessment method for fish in lakes.

The sensitivity of the biological quality elements assessment methods to impacts seems logical for all biological quality elements, with most biological quality elements being sensitive to nutrients and organic enrichment, and fish, benthic invertebrates and the benthic flora biological quality elements (except phytobenthos in rivers) in all water categories being sensitive to habitat alterations caused by hydromorphological pressures.

From this evidence, Spain has made some progress with this recommendation in terms of assessment methods, therefore this recommendation has been partially fulfilled.

- Recommendation: *Ensure the completion as soon as possible of the framework for status assessment considering the following: Include the complete assessment systems for coastal and transitional waters.*

  Assessment: There has been limited progress with this recommendation. The assessment systems for coastal and transitional waters are largely based on the physicochemical quality elements with an equal focus on some but not all biological quality elements and very low level of monitoring and assessment of hydromorphological quality elements in coastal and transitional waters. In addition, expert judgment is used in the assessment of status/potential for the hydromorphological quality elements. Therefore, this recommendation has been partially fulfilled.

- Recommendation: *Ensure the completion as soon as possible of the framework for status assessment considering the following: Report transparently the confidence and limitations of the assessments as appropriate.*

  Assessment: There has been a significant improvement in information on the confidence of the classification reported for the second RBMPs compared to the first. For the first RBMPs 54 % of surface water bodies were reported to have no information on the confidence in classification, this had decreased to 10.5 % for the second. In addition, the proportion with a high confidence classification increased from 14 % for the first RBMPs to 31 % for the second. There was a decrease in the proportion of water bodies reported to have unknown status from 19 % for the first RBMPs to 2 % for the second. Note this comparison is based on the same RBDs for both periods: the number of surface water bodies reported for the first RBMPs was 5122 and for the second, 5115. Therefore this recommendation has been fulfilled.

- Recommendation: *Fill urgently the gaps in monitoring of surface waters and ensure consistent monitoring with appropriate coverage (and thereby classify all water bodies). Ensure that monitoring is adequately resourced and maintained to inform adequately the RBMPs and the decisions on the Programme of Measures.*

  Assessment: As already described there has been limited progress in filling gaps in the monitoring programme and significant gaps still remain. However, a larger proportion of water bodies have been classified for the second than for the first (19 % with unknown status in Spain in the first RBMPs and 2 % in the second). Therefore, this recommendation has been partially fulfilled.

Topic 4 Monitoring, assessment and classification of chemical status in surface water bodies

4.1. Assessment of implementation and compliance with WFD requirements in the second cycle

4.1.1. Monitoring of chemical status in surface waters

Monitoring sites and monitored water bodies used for monitoring of chemical status

Member States have to implement surveillance and operational monitoring programmes in accordance with the requirements of the WFD and of the EQS Directive for the assessment of ecological status/potential and chemical status.

Surveillance monitoring programmes should allow Member States to supplement and validate the impact assessment procedure (see chapter 2), to efficiently and effectively review the design of their monitoring programmes, and to assess the long-term changes in natural conditions and those resulting from widespread anthropogenic activity. For operational purposes, monitoring is required to establish the status of waterbodies identified as being at risk of failing to meet their environmental objectives, and to assess any changes in the status of such waterbodies resulting from the programme of measures.

Section 3.1.1 of this report summarises the characteristics of the surveillance and operational monitoring programmes in Spain for the second RBMP.

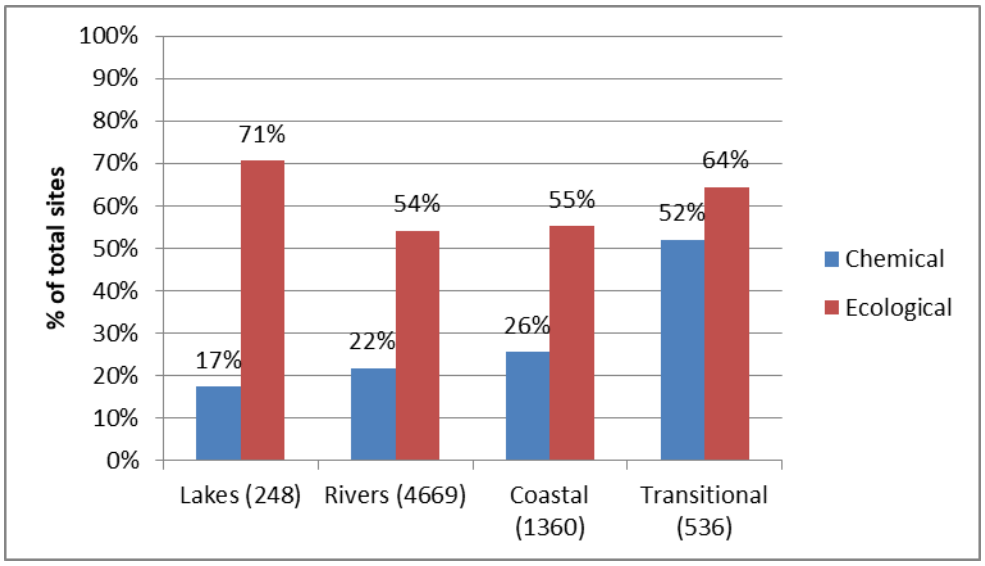
Figure 4.1 summarises the proportion of sites used for the monitoring of chemical status in surface waters for the second RBMP. Territorial waters have not been delineated, monitored or assessed for chemical status. In this figure no distinction is made between sites used for surveillance and/or operational purposes. More detailed information can be found on the website of the European Environment Agency[28].

Figure 4.1 shows that a relatively low proportion of sites are monitored in lakes, rivers and coastal waters (17 %, 22 % and 26 % respectively) for chemical status. A higher proportion of transitional waters are monitored for chemical status (52 %). In contrast, the proportion of sites monitored for ecological status is significantly higher.

[28] https://www.eea.europa.eu/publications/state-of-water.

Figure 4.2 summarises the proportion of water bodies monitored for chemical status in surface waters for the second RBMP. In this figure, no distinction is made between sites used for surveillance and/or operational purposes. Also given is the proportion of water bodies monitored for any purpose and, for comparative purpose, those for ecological status. Relatively low proportions of lake and river water bodies were monitored for chemical status (13 % and 20 % respectively), with higher proportions of transitional waters and coastal waters being monitored for chemical status (48 % and 67 % respectively).

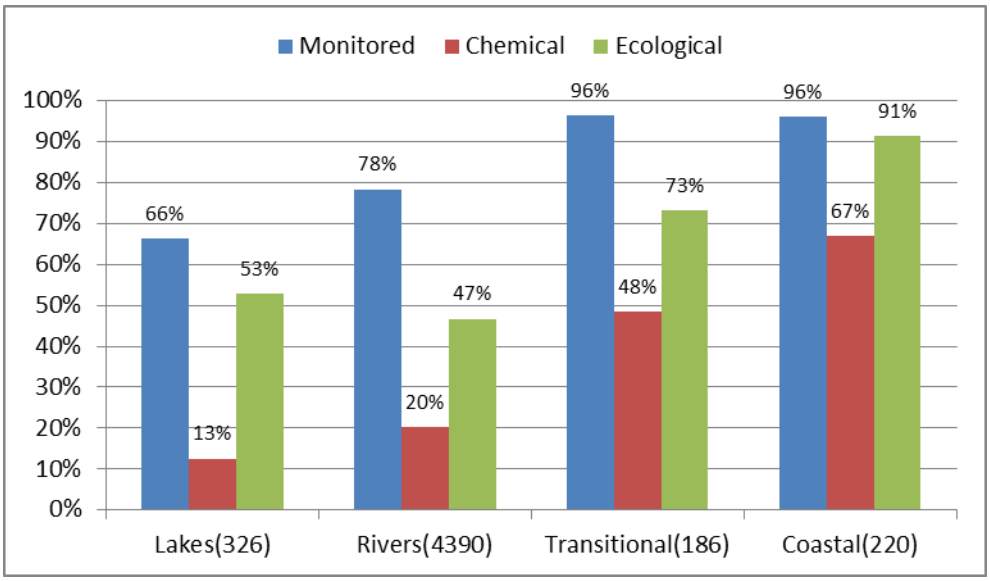
Figure 4.1 ***Proportion of sites used for monitoring of chemical status and, for comparison, ecological status, in Spain. The number in parenthesis next to the category is the total number of monitoring sites irrespective of their purpose[29]***



Source: WISE electronic reporting

[29] There seemed to be inconsistencies in the WISE reporting: a different section of the reporting indicates that monitoring for chemical status is carried out in 38 % of sites in lakes, 53 % in rivers, 31 % in coastal waters and 48 % in transitional waters.

Figure 4.2 ***Proportion of total water bodies in each category, monitored for chemical status and, for comparison, monitored for ecological status, in Spain. The number in parenthesis next to the category is the total number of water bodies in that category[30]***



Source: WISE electronic reporting

In 14 RBDs in Spain, 80 % or more of the river water bodies failing to achieve good chemical status are monitored as part of the operational monitoring programme. In the Guadalete and Barbate RBD, only 20 % of the river water bodies failing to achieve good chemical status are monitored. For the four RBDs where lake water bodies are reported as failing to achieve good chemical status, two RBDs monitor all such lakes (Duero, one lake and Jucar, five lakes) and two RBDs do not monitor any of these lakes (three lakes in Guadalquivir and two lakes in Guadalete and Barbate).

Where coastal water bodies are failing to achieve good chemical status (seven RBDs), all such water bodies are monitored in six RBDs, but only one out of the three coastal water bodies failing to achieve good chemical status are monitored in the Guadalete and Barbate RBD. All of the transitional water bodies failing to achieve good chemical status are monitored in five out of the seven RBDs in which they are reported. Only one transitional water body failing to achieve good chemical status is reported in the Guadalquivir RBD and this is not monitored and two out of three such water bodies in the Andalusian Mediterranean RBD are monitored.

[30] There seemed to be inconsistencies in the WISE reporting: a different section of the reporting indicates that 33 % of lake water bodies, 44 % of river water bodies, 63 % of transitional water bodies and 69 % of coastal water bodies are monitored for chemical status.

No data on the sites and water bodies monitored is provided for the Balearic Islands, Ceuta and Melilla RBD.

Long term trend monitoring and monitoring of Priority Substances in water, sediment and biota

Monitoring for status assessment

Requirements

Article 8.1 of the WFD requires Member States to establish monitoring programmes in order to provide *inter alia* a coherent and comprehensive overview of water status within each RBD. The amount of monitoring undertaken in terms of priority substances, frequency and numbers of sites should be sufficient to obtain a reliable and robust assessment of status. According to the EQS Directive (version in force in 2009), mercury, hexachlorobenzene and hexachlorobutadiene have to be monitored in biota for status assessment, unless Member States derived a standard for another matrix, which is at least as protective as the biota standard.

Spatial coverage

Information on the monitoring of Priority Substances for chemical status was reported to WISE for 15 RBDs. No information was reported for the Balearic Islands, Ceuta and Melilla RBDs.

The number of Priority Substances monitored in water for status assessment is variable between the RBDs in Spain; between 4 and 41 Priority Substances are monitored. Four RBDs (Andalusian Mediterranean Basins; Guadalete and Barbate; and Tinto, Odiel and Piedras and Jucar) reported to be monitoring 41 Priority Substances, whereas the Segura RBD reported only to have monitored four Priority Substances with remainder monitoring between 27 and 40 substances. The RBMPs provide some explanations for this variation: in some cases the previous assessment of pressures have concluded that certain substance were not presenting any significant risk or samples have previously shown very low concentrations; in other cases this was due to budgetary constraints.

There is also a high degree of variability between RBDs and water categories in the proportion of water bodies for more/less than 10 Priority Substances.

Mercury, hexachlorobenzene and hexachlorobutadiene are monitored in biota for status assessment in 4 RBDs (Miño-Sil, Eastern Cantabrian, Duero and Ebro); in the Jucar RBD only mercury and hexachlorobutadiene) are monitored in biota. None of these substances is monitored in biota for status assessment in the remaining RBDs. In the RBDs where these substances are monitored, coastal water bodies are not monitored but the remainder of the water categories are generally monitored (apart for hexachlorobenzene in lakes and not for hexachlorobutadiene in transitional waters). Monitoring is undertaken at up to between one and 13 sites; the spatial extent is limited.

Frequencies

The WFD indicates that, for the surveillance and operational monitoring of Priority Substances in water, the frequency of monitoring should be at least monthly for one year during the RBMP cycle and at least monthly every year, respectively. Monitoring in biota for status assessment should take place at least once every year according to the EQS Directive. In all cases greater intervals can be applied by Member States if justified on the basis of technical knowledge and expert judgement.

The recommended minimum frequencies were met at least at some sites for 38 of the 41 substances for operational monitoring, and for 40 substances surveillance monitoring. Fewer substances meet these recommended minimum frequencies in coastal and transitional waters than in surface freshwaters. There is however some variation between RBDs. Spain subsequently clarified that further standardisation in the frequency of monitoring is planned for future monitoring programmes.

Monitoring of biota for mercury, hexachlorobenzene and hexachlorobutadiene is undertaken at the recommended minimum frequency in some but not all sites for four of the five RBDs where such monitoring is undertaken (the reported frequency in the Jucar RBD is 12 times per year at least once in the monitoring cycle).

Monitoring for long-term trend assessment

Requirements

Article 3.3 of the EQS Directive (version in force in 2009) requires Member States to monitor 14 priority substances[31] that tend to accumulate in sediment and/or biota, for the purpose of long-term trend assessment. Monitoring should take place at least once every three years, unless technical knowledge and expert judgment justify another interval.

Spatial coverage

With respect to long-term trend assessment, Spain monitors up to 14 Priority Substances in sediment (including settled sediment) and or biota. However, this is undertaken in only one RBD (Eastern Cantabrian) with fewer substances monitored in five RBDs (Miño-Sil (10), Andalusian Mediterranean Basins (3), Guadalete and Barbate (3), Tinto, Odiel and Piedras (3) and Jucar (13)) and for no priority substances in nine RBDs. Monitoring is undertaken at some sites in all water categories. The spatial extent of monitoring is limited; between 2 and 15 sites are monitored for sediment and/or biota for trend assessment.

Frequencies

The required monitoring frequency for long-term trend assessment of at least once every three years is met at the majority of sites where this monitoring is undertaken.

Monitoring of Priority Substances that are discharged in each RBD

Annex V of the WFD states, in Section 1.3.1 (Design of surveillance monitoring), that "Surveillance monitoring shall be carried out for each monitoring site for a period of one year during the period covered by a river basin management plan for [*inter alia*]: priority list pollutants which are discharged into the river basin or sub-basin." Section 1.3.2 (Design of operational monitoring) of the Directive states that "In order to assess the magnitude of the pressure to which bodies of surface water are subject Member States shall monitor for those quality elements which are indicative of the pressures to which the body or bodies are subject. In order to assess the impact of these pressures, Member States shall monitor as relevant [*inter*

[31] Anthracene, brominated diphenylether, cadmium, C10-13 chloroalkanes, DEHP, fluoranthene, hexachlorobenzene, hexabutadiene, hexachlorocyclohexane, lead, mercury, pentachlorobenzene, PAH, Tributyltin.

alia]: all priority substances discharged, and other pollutants discharged in significant quantities."

Member States are therefore required to monitor all Priority Substances which are discharged into the river basin or sub-basin.

Information on Priority Substances included in inventories and discharged into RBDs has been reported to the WISE database for 17 RBDs; including two RBDs (Balearic Islands and Melilla) where no information on monitoring was reported (so it is assumed that no monitoring was performed). For Ceuta, no monitoring programme was reported, and Spain subsequently clarified that an inventory has been established for this RBD.

In 10 out of the 17 RBDs, all Priority substances included in an inventory and discharged were monitored. In seven RBDs at least some of the discharged substances were not monitored according to WISE.

Not all inventories considered all priority substances, so it is not clear whether all discharged substances have been identified.

Performance of the analytical methods used

In Spain, for all of the 41 Priority Substances listed, the analytical methods meet the minimum performance criteria laid down in Article 4(1) of the Directive 2009/90/EC in nearly all RBDs (never for less than 15 of the 18 RBDs listed). In the RBDs where the analytical methods did not meet these criteria, the analytical methods complied with the requirements laid down in Article 4(2) of the Directive (best available techniques not entailing excessive costs). The only RBD where analytical methods were reported not to meet either Article 4(1) or Article 4(2) was for Guadiana for 11 out of the 41 Priority Substances listed for this RBD[32].

The method of dealing with measurements of Priority Substances lower than the limit of quantification is as specified in Article 5 of the Directive 2009/90/EC[33] for 16 RBDs in Spain but not for two RBDs (Ceuta and Melilla). This must be a reporting mistake, as Ceuta and Melilla did not report any monitoring for priority substances.

[32] Spain subsequently clarified that this is due to an error in reporting and that all RBDs have used the same analytical methods.

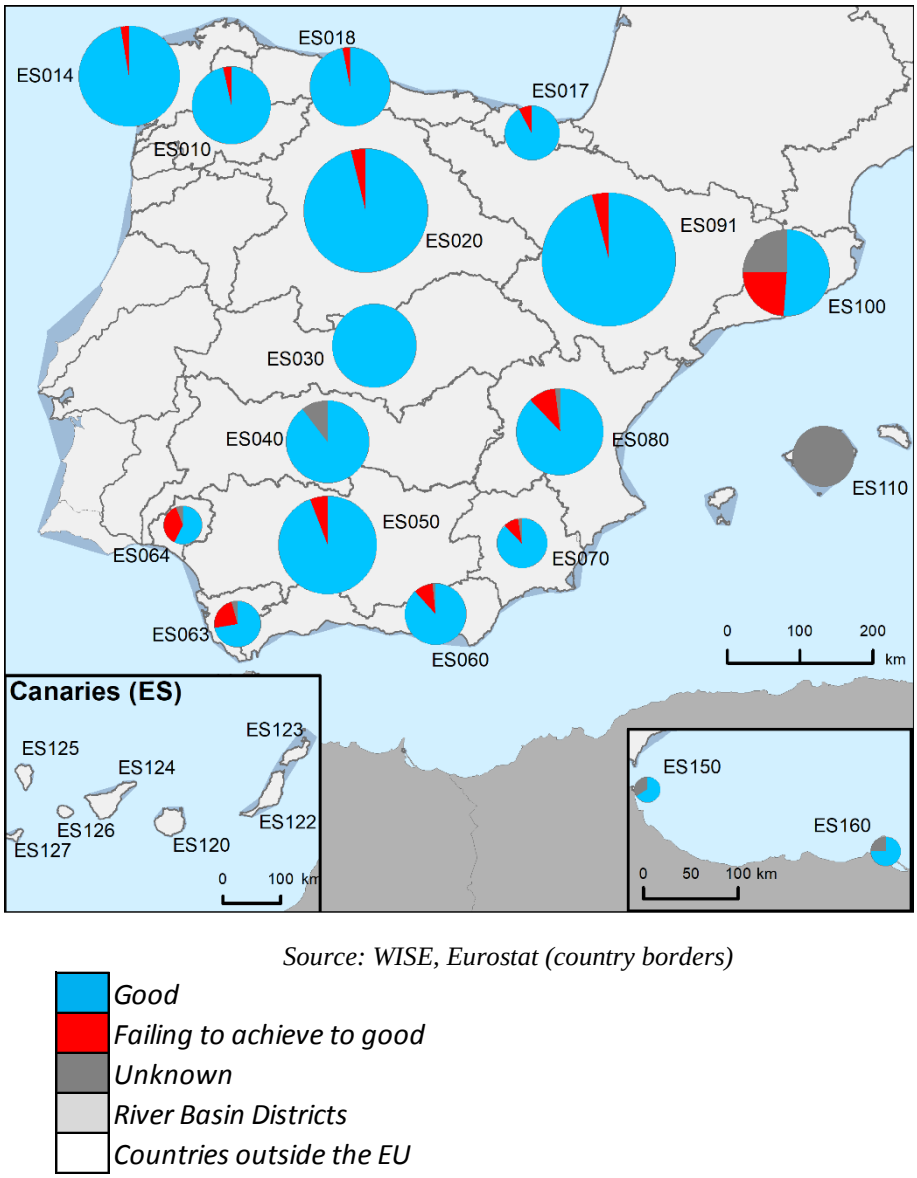
[33] Directive 2009/90/EC of 31 July 2009 laying down, pursuant to Directive 2000/60/EC of the European Parliament and of the Council, technical specifications for chemical analysis and monitoring of water status http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1524565750309&uri=CELEX:32009L0090

4.1.2. Chemical Status of surface water bodies

Member States are required to report the year on which the assessment of chemical status is based. This may be the year that the surface water body was monitored. In case of grouping this may be the year in which monitoring took place in the surface water bodies within a group that are used to extrapolate results to non-monitored surface water bodies within the same group. In Spain, 50 % of chemical status assessments were carried out in unspecified years between 2009 and 2013. However 25 % of the assessments were reported to occur in the specific years of 2013 and 2014.

The chemical status of surface water bodies in Spain for the second RBMP is illustrated on the map below. This is based on the most recent assessment of status.

Map 4.1 ***Chemical status of surface water bodies in Spain based on the most recently assessed status of the surface water bodies Note: Standard colours based on WFD Annex V, Article 1.4.3.***



Source: WISE, Eurostat (country borders)

In Spain overall, 87 % of water bodies are reported as being at good chemical status.

The chemical status of surface waters in Spain for the first and second RBMPs is given in Table 4.1.

Table 4.1 ***Chemical status of surface water bodies in Spain for the second and first RBMP. Note: the number in parenthesis next to the water category is the number of water bodies. Note: Chemical status assessment is based on the standards laid down in EQS Directive. Some Member States did not implement the Directive in the first RBMPs as the transposition deadline was in July 2010, after the adoption of the first RBMPs***

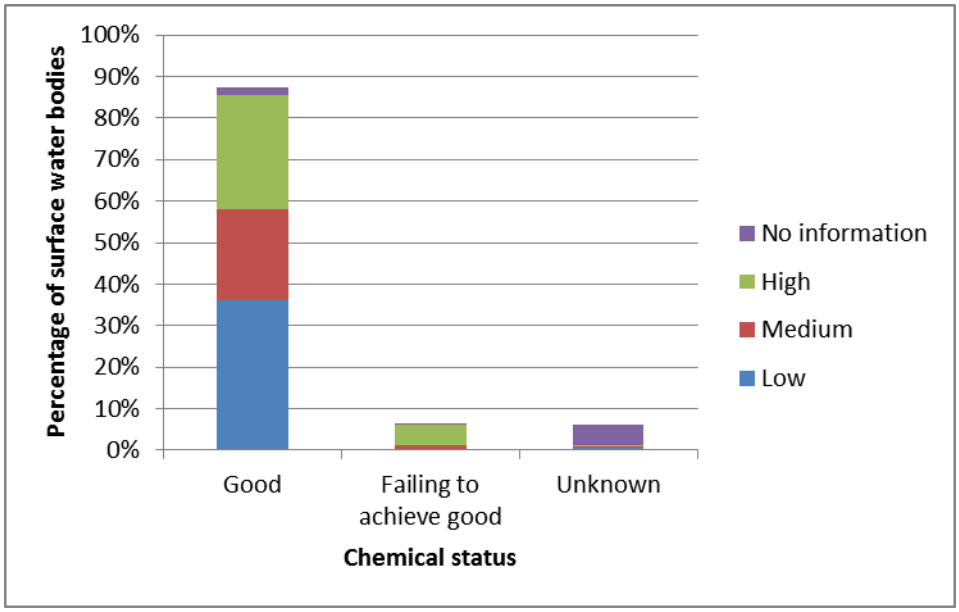
Category	Good		Failing to achieve good		Unknown	
	Number	%	Number	%	Number	%
second RBMP						
Lakes (326)	275	84 %	11	3 %	40	12 %
Rivers (4390)	3950	90 %	272	6 %	168	4 %
Coastal (220)	152	69 %	22	10 %	46	21 %
Transitional (186)	99	53 %	24	13 %	63	34 %
Total (5122)	4476	87.4 %	329	6.4 %	317	6.2 %
first RBMP						
Lakes (310)	75	24 %	3	1 %	232	75 %
Rivers (4374)	2662	61 %	236	5 %	1476	34 %
Coastal (260)	161	62 %	17	7 %	82	32 %
Transitional (180)	63	35 %	17	9 %	100	56 %
Total (5124)	2961	58 %	273	5 %	1890	37 %

Source: WISE electronic reporting

Improvements in chemical status were observed across all water body types with a concomitant decrease in water bodies classified with unknown status.

Figure 4.3 shows the confidence in the classification of chemical status for the second RBMP. 33 % of surface water bodies were classified for chemical status with high confidence, 23 % with medium confidence and 37 % with low confidence (no information was reported for the remainder). Confidence in the classification of chemical status for the first RBMPs was not reported.

Figure 4.3 Confidence in the classification of chemical status of surface water bodies in Spain based on the most recently assessed status/potential



Source: WISE electronic reporting

Figure 4.4 compares the chemical status of surface water bodies in Spain for the first RBMPs with that for the second RBMPs (based on the most recent assessment of status) and that expected by 2015. Between the two RBMPs there was a large increase in the proportion of surface water bodies with good chemical status from 58 to 87 % and a small increase in the proportion failing to achieve good chemical status. Furthermore, the proportion with unknown status has reduced from 37 to 6 %.

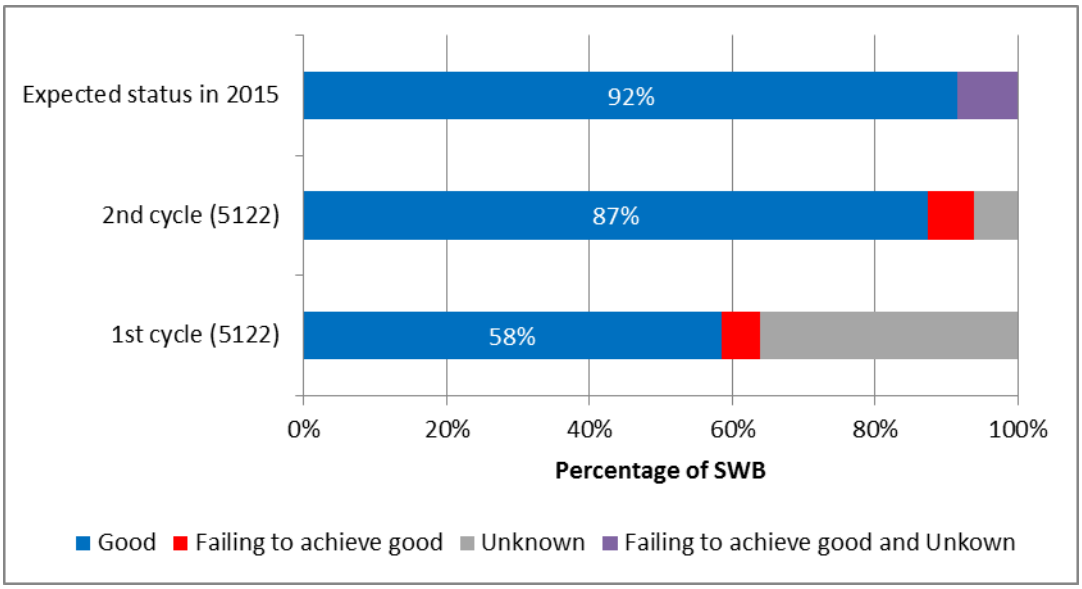
54 % of water bodies were classified by monitoring, 45 % by expert judgement and less than 1 % by grouping. The majority of surface water bodies (92 %) were expected to be achieving good chemical status at the end of the first cycle; however, slightly fewer (87 %) were observed in the second RBMP (Figure 4.4).

The assessment of chemical status for the second RBMP was expected to be based on the standards laid down in the EQS Directive (version in force on 13 January 2009[34]). Some Member States did not fully implement the Directive in the first RBMPs as the transposition deadline was in July 2010, after the adoption of the first RBMPs.

[34] Please note that following Directive 2013/39/EU, which amended the Environmental Quality Standards Directive, introduced a less stringent annual average EQS for naphthalene in transitional waters. This less stringent environmental quality standard should be taken into account for the determination of surface water chemical status by the 2015 deadline laid down in Article 4 of the WFD.

More information on the chemical status in each RBD and water category can be found on the website of the European Environment Agency[35].

Figure 4.4 ***Chemical status of surface water bodies in Spain for the second RBMPs, for the first RBMPs and expected in 2015. The number in the parenthesis is the number of surface water bodies for both cycles. Note the period of the assessment of status for the second RBMP was 2007 to 2014. The year of the assessment of status for first RBMP is not known***



Source: WISE electronic reporting

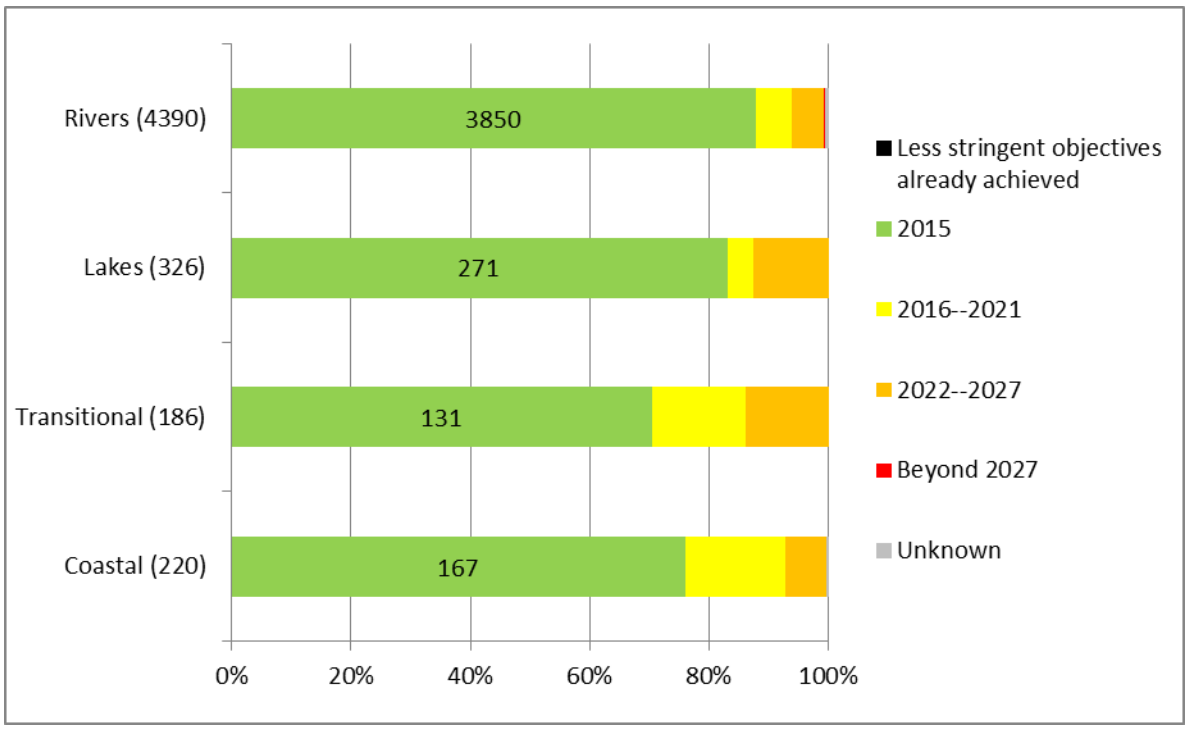
Directive 2013/39/EU amended the EQS Directive. In particular, it sets more stringent environmental quality standards for seven substances[36].Member States were asked to report whether the new standards caused the status of the surface water body to appear to deteriorate. This was the case for 1.8 % of surface water bodies as a result of the more stringent standard for nickel, and 1.2 % of surface water bodies for lead. Deteriorations due to more stringest standards for fluoranthene, benzo(a) pyrene, total benzo(b)fluor-anthene + benzo(k)fluor-anthene and total benzo(g,h,i)-perylen + indeno(1,2,3-cd)-pyrene occurred to a lesser extent.

[35] https://www.eea.europa.eu/publications/state-of-water.
[36] https://www.eea.europa.eu/publications/state-of-water.

Good chemical status should be reached by 2021 in relation to the revised environmental quality standards, unless Member States apply exemptions under WFD Article 4(4) and/or less stringent objectives under WFD Article 4(5).

Member States were asked to report the expected date for the achievement of good chemical status. The information for Spain is shown in Figure 4.5. Good chemical status of surface water bodies is expected to be achieved by the end of the third cycle in all water bodies in 12 out the 18 RBDs that have reported. In the Tagus, Guadalquivir, Andalusian Mediterranean and Ebro RBDs, 2 %, 0.25 %, 4.5 % and 3 % of river water bodies respectively are not expected to achieve good status by the end of the 3rd cycle. No data on the expected achievement of good status in the first RBMPs was provided.

Figure 4.5 ***Expected date of achievement of good chemical of surface water bodies in Spain. The number in the parenthesis is the number of water bodies in each category***



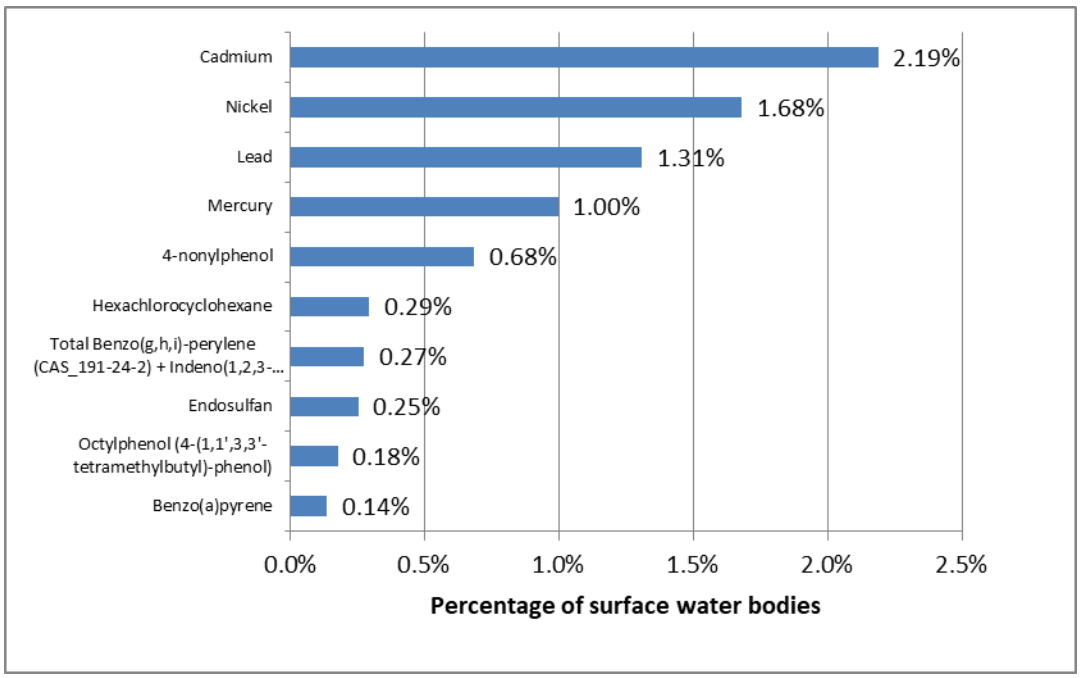
Source: WISE electronic reporting

Priority Substances causing the failure of good chemical status

Member States were expected to report exceedances for individual substances on the basis of the revised, more stringent standards from Directive 2013/39/EU.

The substances causing the greatest proportion of water bodies to fail good chemical status were cadmium, lead, nickel and mercury. The "top-ten" substances are shown in Figure 4.6.

Figure 4.6 The top-10 Priority Substances causing failure to achieve good chemical status in surface water bodies in Spain[37]



Source: WISE electronic reporting

Spain subsequently clarified that the top ten substances are Cadmium (2.19 % of water bodies failing), Nickel (1.68 %), Lead (1.33 %), Mercury (1.00 %), nonylphenol (0.68 %), Chlorpyrifos (0.66 %), Hexachlorocyclohexane (0.29 %), Total Benzo(g,h,i)-perylene + Indeno(1,2,3-cd)-pyrene (0.27 %), Endosulfan (0.25), Tributyltin-cation (0.25 %).

Ubiquitous persistent, bioaccumulative and toxic Priority Substances

According to article 8(a) of the EQS Directive[38], eight priority substances and groups of priority substances are behaving like ubiquitous, persistent, bioaccumulative and toxic substances[39]. These substances are generally expected to cause widespread exceedances, and their emissions can be challenging to tackle (e.g. due to long-range atmospheric transport and deposition). In order to show the progress made in tackling other priority substances, Member

[37] Spain subsequently provided alternative figures for the top ten failures occurring because of Cadmium (2.19 %), Nickel (1.68 %), Lead (1.33 %), Mercury (1.00 %), nonylphenol (0.68 %), Chlorpyrifos (0.66 %), Hexachlorocyclohexane (0.29 %), Total Benzo(g,h,i)-perylene + Indeno(1,2,3-cd)-pyrene (0.27 %), Endosulfan (0.25), Tributyltin-cation (0.25 %).

[38] Amended by Directive 2013/39/EU.

[39] Brominated diphenylether, Mercury and its compounds, Polyaromatic hydrocarbons (PAH), Tributyltin, PFOS, dioxins, hexabromocyclodecane and heptachlor.

States have the possibility to present the information related to chemical status separately for these substances.

6.4 % of surface water bodies are failing to achieve good status and 24 % of these had at least one ubiquitous persistent, bioaccumulative and toxic Priority Substance failing its environmental quality standard. However, only a proportion of these failures were caused by these substances alone; without ubiquitous persistent, bioaccumulative and toxic Priority Substances 5 % of surface water bodies fail to achieve good status. The influence of these substances on the chemical status of surface water bodies is assessed as limited.

This is illustrated in the 2018 State of Water report of the European Environment Agency[40].

Priority Substances used in the assessment of chemical status compared to those monitored

Spain subsequently clarified that information reported to WISE regarding the Priority Substances used in the assessment of chemical status was incorrect. It appears that Spain has used all substances reported as monitored in the assessment of chemical status.

Application of alternative environmental quality standards for water, biota and sediment

According to the EQS Directive, Member States may opt to apply environmental quality standards for another matrix than the one specified in the Directive for a given substance. If they do so, they have to ensure the environmental quality standard they set in the other matrix (or matrices) offers at least the same level of protection as the standard established in the Directive.

No alternative and/or additional standards were reported to be used for the any of the RBDs in Spain.

Use of mixing zones

Article 4 of the EQS Directive provides Member States with the option of designating mixing zones adjacent to points of discharge in surface waters. Concentrations of priority substances may exceed the relevant environmental quality standard within such mixing zones if they do not affect the compliance of the rest of the surface water body with those standards. Member

[40] https://www.eea.europa.eu/publications/state-of-water (p40-41 of the report). Also available in a more interactive format at : https://tableau.discomap.eea.europa.eu/t/Wateronline/views/WISE_SOW_SWB_Chemical_Status_Maps/SWB_Failing_Good_Chemical_Status_RBD?iframeSizedToWindow=true&:embed=y&:showAppBanner=false&:display_count=no&:showVizHome=no

States that designate mixing zones are required to include within their RBMPs a description of the approaches and methodologies applied to define such zones, and a description of the measures taken to reduce the extent of the mixing zones in the future.

Mixing zones have not been designated in any of the 18 RBDs in Spain.

Background Concentrations and Bioavailability

The EQS Directive stipulates that Member States have the possibility, when assessing the monitoring results against the environmental quality standard, to take into account:

> (a) natural background concentrations for metals and their compounds, if they prevent compliance with the environmental quality standard, and;
>
> (b) hardness, pH or other water quality parameters that affect the bioavailability of metals.

Natural background concentrations for metals and their compounds are taken into consideration in nine of Spain's RBDs.

Water quality parameters that affect the bioavailability of metals when assessing monitoring results against relevant environmental quality standards have been taken into account in nine RBDs in Spain but not in nine other RBDs.

4.2. Main changes in implementation and compliance since the first cycle

Between the first and second RBMP there was a net decrease in the number of operational monitoring sites, but an increase in the number of surface water bodies monitored for operational purposes. The overall decrease in surface monitoring sites reflects a considerable reduction in monitoring of coastal and transitional sites offset to some extent by an increase in river monitoring sites. Both the surveillance monitoring sites and the water bodies monitored for surveillance purposes have decreased significantly from the first cycle. Some possible explanations are provided including: the previous assessment of pressures has deemed certain substance as not presenting any significant risk (hence a reduction in monitoring); samples have previously shown very low concentrations (hence not considered relevant and monitoring has been reduced), and budgetary constraints.

There has been a re-delineation of water bodies between the two RBMPs and therefore a direct comparison of the number of water bodies in each status class should be treated with some caution.

Between the two RBMPs, the proportion with unknown status has reduced from 37 to 6 %. This resulted in a large increase in the proportion of good chemical status (from 58 % to 87 %) and a small increase in the proportion of water bodies failing to achieve good status (from 5 to 6 %). Spain subsequently clarified that this due to a better spatial characterisation of the pressures impacting on chemical status. A similar pattern of changes was observed in natural, heavily modified and artificial water bodies.

25 Priority Substances were reported to have resulted in the improvement of surface water bodies from failing to achieve good to good chemical status since the first RBMP. In terms of the total number of water bodies improved, the percentages were relatively low: lead (1 %), mercury (0.5 %), cadmium (0.4 %), endosulfan (0.4 %) and diuron (0.25 %).

4.3. Progress with Commission recommendations

The Commission recommendations based on the first RBMPs and first Programme of Measures requested action on the following:

- Recommendation: *Ensure the completion as soon as possible of the framework for status assessment considering the following: The complete assessment framework, and in particular the intercalibration results of 2013 and the new standards introduced by Directive 2013/39/EU for existing priority substances, should be considered in the status assessments for the second RBMP.*

  Assessment: The number of Priority Substances monitored in water for status assessment is variable between the 15 of the 18 RBDs in Spain for which information on monitoring was reported; between 4 and 41 Priority Substances are monitored. Many but not all discharged substances are reported to be monitored. The proportion of water bodies monitored in each category varies significantly between RBDs and water categories. No monitoring and assessment is undertaken in territorial waters.

  Mercury and hexachlorobutadiene are monitored in biota and the biota standard is used for status assessment in 4 RBDs, this was also the case for hexachlorobutadiene in four RBDs. For the remainder of the RBDs, these substances are not monitored.

Spain is reporting exceedances for individual substances based on the revised environmental quality standards from Directive 2013/39/EU.

Progress has therefore been made with the completion of the assessment framework for chemical status in surface waters; this needs to be extended to all RBDs. The recommendation is partially fulfilled.

- Recommendation: *There are important gaps that need to be addressed in the status assessment. There is confusion between Priority Substances and River Basin Specific Pollutants.*

  Assessment: There is evidence to suggest that some progress has been made as, in general, only Annex I substances of Directive 2008/105/EC are now referred to in the information provided under this topic. In 10 out of the 18 RBDs, all Priority substances included in an inventory and discharged were monitored. In a further seven RBDs, some of the substances discharged are not monitored. Mercury, hexachlorobenzene and hexachlorobutadiene are monitored in biota for status assessment in four RBDs (mercury and hexachlorobutadiene are also monitored in one more RBD). For the remainder of the RBDs, these substances are not monitored in biota for status assessment. The proportion of surface water bodies with unknown status has reduced from 37 % to 6 % indicating progress towards a more comprehensive classification. Overall in Spain, 54 % of water bodies were classified by monitoring, 45 % by expert judgement and less than 1 % by grouping. Further examination of the basis and justification of this expert judgement was explored further but none of the assessed RBMPs provided clear information on the method applied. Therefore, this recommendation has been partially fulfilled.

- Recommendation: *Ensure the completion as soon as possible of the framework for status assessment considering the following: Include the complete assessment systems for coastal and transitional waters; report transparently the confidence and limitations of the assessments as appropriate.*

  Assessment: The complete assessment systems have been partially implemented in coastal and transitional waters; monitoring in water is well represented in these categories but monitoring of biota is not undertaken in coastal waters. The overall proportion of surface water bodies with unknown status has reduced from 37 % to 6 % indicating that progress has been made. Confidence in the classification of chemical

status is reported but remains relatively low with 37 % of all surface water bodies in Spain being classified with low confidence. The proportion is similar for coastal and transitional waters with 40 % and 22 % of coastal and transitional waters combined classified with high and medium confidence respectively; the remainder (38 %) with low confidence or no information where unknown status has been assigned. Some progress has therefore been made and this recommendation has been partially fulfilled.

- Recommendation: *Fill urgently the gaps in monitoring of surface waters and ensure consistent monitoring with appropriate coverage (and thereby classify all water bodies). Ensure that monitoring is adequately resourced and maintained to inform adequately the RBMPs and the decisions on the Programme of Measures.*

  Assessment: Monitoring of Priority Substances reported in the second RBMP includes monitoring in water and biota for status assessment and in sediments and biota for trend assessment.

  Monitoring in water is undertaken for the majority of Priority Substances including almost all of those discharged into the RBDs. It is undertaken in all water categories (except territorial waters) and in all RBDs reporting information on monitoring (15 out of 25). The recommended minimum frequencies were met at least at some sites for 40 of the 41 substances for operational monitoring, and for all substances for surveillance monitoring.

  Monitoring in biota for status assessment is undertaken in only five RBDs and not in coastal (or territorial) waters. The spatial extent of monitoring appears to be very limited though the frequency meets the recommended minimum frequency at the majority of monitoring sites.

  Monitoring in sediment and biota for trend assessment is undertaken for up to 14 Priority Substances in sediment (including settled sediment) and or biota. However, this is undertaken in only one RBD with fewer substances monitored in five RBDs and for no priority substances in nine RBDs. Monitoring is undertaken at some sites in all water categories. The spatial extent of monitoring appears to be very limited. The recommended minimum frequency was met in the majority of sites.

  The number of water bodies with unknown status has decreased substantially (from 37 % to 6 %) since the first RBMP; a small proportion of water bodies remain to be

classified in the 18 RBDs. 54 % of the classified water bodies were classified by monitoring, 45 % by expert judgement and less than 1 % by grouping. A relatively high proportion of water bodies are therefore classified by expert judgement, and this is probably linked to the low level of confidence in the assessment for a significant proportion of water bodies.

The second RBMPs report an overall decrease in monitoring sites since the first RBMP but Spain has clarified that plans and resources are in place to extend the monitoring to cater for all of the requirements concerned in monitoring programmes to be reported in the next RBMP. This suggests that resources for monitoring have been limiting.

The remaining gaps include the need to extend the monitoring to all RBDs and all water categories and to increase and harmonise the frequency of monitoring. Spatial coverage should also allow classification of all water bodies with sufficient certainty.

This recommendation has been partially fulfilled.

- Recommendation*: Extend monitoring of chemicals beyond water bodies affected by industrial discharges. Consider as well atmospheric deposition and urban waste water discharges as relevant sources of chemical pollution.*

  Assessment: The overall number of operational and surveillance monitoring sites has decreased between the two RBMPs indicating that monitoring of chemicals has perhaps not been diversified to any great extent. Atmospheric deposition and urban wastewater discharges have been reported as pressures associated with water bodies failing to achieve good status. In 14 RBDs in Spain, a very high proportion (80 % or more) of the river water bodies failing to achieve good chemical status are monitored as part of the operational monitoring programme. For a more complete assessment of the monitoring programmes, please see recommendation above. Therefore, this recommendation has been partially fulfilled.

Topic 5 Monitoring, assessment and classification of quantitative status of groundwater bodies

5.1 Assessment of implementation and compliance with WFD requirements in the second cycle

5.1.1 Monitoring of quantitative status in groundwater

For the 18 RBDs which reported their second RBMPs, the total number of groundwater bodies in Spain is 729 (Table 2.3). According to the reported information, 85 groundwater bodies are not subject to monitoring for quantitative status (Table 5.1)[41]. Overall, this means that 12 % of groundwater bodies are not monitored. There is no monitoring at all in Ceuta and Melilla, in which there are four groundwater bodies. In some, but not all RBMPs assessed, grouping was applied. No information on the methodology and considered elements were provided in any of the RBMPs assessed.

The overall number of groundwater bodies decreased from 748 in the first RBMP to 729 in the second RBMP and the total groundwater body area remained nearly the same. It has to be considered, that the first RBMP includes information on the 32 groundwater bodies of the Canary Island RBDs, but they have not been reported for the second RBMP. 701 groundwater bodies remained unchanged since the first RBMP.

Overall, the number of monitored groundwater bodies (groundwater quantity monitoring) increased from 642 (in 21 RBDs) in the first RBMP to 644 (16 RBDs) in the second RBMP. Comparing only RBDs where information is available for both RBMPs, the number of groundwater bodies monitored for quantitative status increased from 620 to 644. Significant changes happened in three RBDs (Guadalete and Barbate, Tinto, Odiel and Piedras and Andalusian Mediterranean Basins) where monitoring is now reported and in Segura where the number of monitored groundwater bodies dropped from 62 to 39 and in Guadalquivir where the number increased from 58 to 78. The number of monitoring sites is listed in Table 5.3 and shows that the total number increased from 2946 in the first RBMP to 3189 in the second RBMP. But it has to be considered that in the first RBMP monitoring sites have been reported for 16 RBDs and in the second RBMP for 18 of 25 RBDs. When comparing only RBDs where information is available for both RBMPs, the number of monitoring sites increased from 2785 to 3189, an increase of around 15 %.

[41] Taking into account the data subsequently provided by Spain, the number of not monitored groundwater bodies would be 78.

637 of 729 groundwater bodies are identified as drinking water protected areas, allocated in 17 RBDs.

Table 5.1 Number of water bodies in Spain directly monitored and the purpose of monitoring

RBD	Total ground water bodies directly monitored	Monitoring Purpose												
		AGR – Ground water abstraction site for irrigation	CHE – Chemical status	DRI – Ground water abstraction site for human consumption	DWD – Drinking water - WFD Annex IV.1.i	HAB – Protection of habitats or species depending on water - WFD Annex IV.1.v	IND – Ground-water abstraction site for industrial supply	INV – Investigative monitoring	NID - Nutrient sensitive area under the Nitrates Directive - WFD Annex IV.1.iv	OPE – Operational monitoring	QUA – Quantitative status	SOE - EIONET State of Environment monitoring	SUR – Surveillance monitoring	TRE – Chemical trend assessment
ES010	6			3		3		2		3	6		6	
ES014	18		18								17(18)		18	
ES017	20		20		7						17			20
ES018	20		20	20							13		20	
ES020	64			50					7	20	63	32	61	
ES030	24				13			3		19	24		20	
ES040	20	19	20	13			19		20		19	19		20
ES050	81		49	30						80	78			
ES060	65		64 (65)							40	48		65	
ES063	14		14		8					14	12		14	
ES064	4		4		4					3	4		4	
ES070	57		54	16					13	20	39 (44)		42	54
ES080	90		89		82					53	86		89	
ES091	105	58	104	99	101		19		66	72	102		104	
ES100	36		30		26				36	31	30 (31)		36	
ES110	86		86	79						47	86			

Source: WISE electronic reporting. The numbers in brackets were subsequently provided by Spain and do not match the data reported to WISE.

Table 5.2 Proportion of groundwater bodies in Spain monitored for quantitative status

RBD	No. of groundwater bodies with quantitative monitoring	Total No. groundwater bodies	% of total groundwater bodies monitored for quantitative status
ES010	6	6	100 %
ES014	17 (18)	18	94 % (100 %)
ES017	17	20	85 %
ES018	13	20	65 %
ES020	63	64	98 %
ES030	24	24	100 %
ES040	19 (20)	20	95 % (100 %)
ES050	78	86	90.70 %
ES060	48	67	71.64 %
ES063	12	14	85.71 %
ES064	4	4	100.00 %
ES070	39 (44)	63	61.90 % (69.84 %)
ES080	86	90	95.56 %
ES091	102	105	97.14 %
ES100	30	37	81.08 %
ES110	86	87	98.85 %

Source: WISE electronic reporting. The numbers in brackets were subsequently provided by Spain and do not match the data reported to WISE.

Table 5.3 Number of groundwater monitoring sites in Spain and their purpose

RBD	Total ground-water monitoring sites	Monitoring Purpose												
		AGR – Ground water abstraction site for irrigation	CHE – Chemical status	DRI – Ground water abstraction site for human consumption	DWD – Drinking water - WFD Annex IV.1.i	HAB – Protection of habitats or species depending on water - WFD Annex IV.1.v	IND – Ground-water abstraction site for industrial supply	INV – Investigative monitoring	NID - Nutrient sensitive area under the Nitrates Directive - WFD Annex IV.1.iv	OPE – Operational monitoring	QUA – Quantitative status	SOE - EIONET State of Environment monitoring	SUR – Surveillance monitoring	TRE – Chemical trend assessment
ES010	80	0	0	8	0	18	0	14	0	23	23	0	44	0
ES014	83(73)	0	83(73)	0	0	0	0	0	0	0 (3)	57	0	83(75)	0
ES017	150	0	57	0	64	0	0	0	0	0(16)	30	0	0(41)	57
ES018	74	0	38	37	0	0	0	0	0	0	36	0	38	0
ES020	991	0	0	135	0	0	0	0	38	131	547	64	341	0
ES030	402	0	0	0	45	0	0	3	0	68	215	0	71	0
ES040	552	383	169 (229)	64	0	0	383	0	169 (229)	60	383	53	0 (169)	169
ES050	482	0	171	69	0	0	0	0	0	400	311	0	0 (31)	0
ES060	558	0	189 (192)	0	0	0	0	0	0	142	366	0	183	0
ES063	155	0	96	0	26	0	0	0	0	96	59	0	96	0
ES064	86	0	56	0	16	0	0	0	0	45	30	0	56	0
ES070	369	0	121	30	0	0	0	0	28	46	193	0	75	121
ES080	615	0	322	0	83	0	0	0	0	116	293	0	261	0
ES091	1,996	219	1723 (1724)	539	425	0	28	0	761	1040	312	0	675	0
ES100	893	0	117	0	114	0	0	0	546	496	207 (225)	0	472	0
ES110	279	0	184	165	0	0	0	0		122	127	0	0 (184)	0

Source: WISE electronic reporting. The numbers in brackets were subsequently provided by Spain and do not match the data reported to WISE.

5.1.2 Assessment and classification of quantitative status for groundwater[42]

Map 3 displays the most recently assessed quantitative status of groundwater bodies. It shows that 550 of 729 groundwater bodies (75 %) were in good quantitative status and 179 (24,55 %) were failing good status (Figure 5.1). In terms of area, this means that about 19 % were failing good quantitative status. Figure 5.2 shows the confidence in status classification. All groundwater bodies now have a clear status. This situation improved as for the first RBMPs 11 groundwater bodies were of unknown status. About 25 % of the groundwater bodies are at risk of failing good quantitative status.

The number of groundwater bodies failing good quantitative status declined from 187 groundwater bodies in the first RBMP to 179 in the second RBMP.

For most RBDs, a water balance method was reported to have been applied. In 14 RBDs water balance was assessed by a comparison of annual average groundwater abstraction against the 'available groundwater resource' for every groundwater body. In three RBDs water balance was assessed by using reliable information on groundwater levels across the groundwater body. In Jucar the water balance method was not reported.[43]

Several reasons for failing good quantitative status of groundwater bodies were reported from 11 RBDs as shown in Figure 5.3: 165 groundwater bodies are failing good status due to failing the water balance test, which means that the long-term annual average rate of groundwater abstraction is exceeding the available groundwater resource. 53 groundwater bodies are failing due to deterioration of the status of associated surface waters, 27 due to damage to groundwater terrestrial ecosystems and 20 groundwater bodies are failing due to saline intrusion. The expected date of achievement of good quantitative status in Spain is shown in Figure 5.4.

The criterion of 'available groundwater resource' has been applied in accordance with WFD Article 2(27) in 17 of 18 reported RBDs. For the Jucar RBD the information was not reported.

All environmental objectives have been widely considered in status assessment but not in all RBDs. In Catalan RBDs, deterioration of the status of associated surface waters has not been considered although such ecosystems exist. In Duero, Jucar and in Catalan River Basin District

[42] It has to be considered, that the first RBMP includes information on the groundwater bodies of the Canary Islands RBDs, but they have not been reported for the second RBMP.

[43] Spain subsequently clarified that there was an error in the reporting, and that the water balance test is applied in the Jucar RBD as well as the 'available groundwater resource' criterion.

the damage to groundwater dependent terrestrial ecosystems has not been reported as considered exist. Saline intrusion was considered in 10 of 18 reported RBDs.[44]

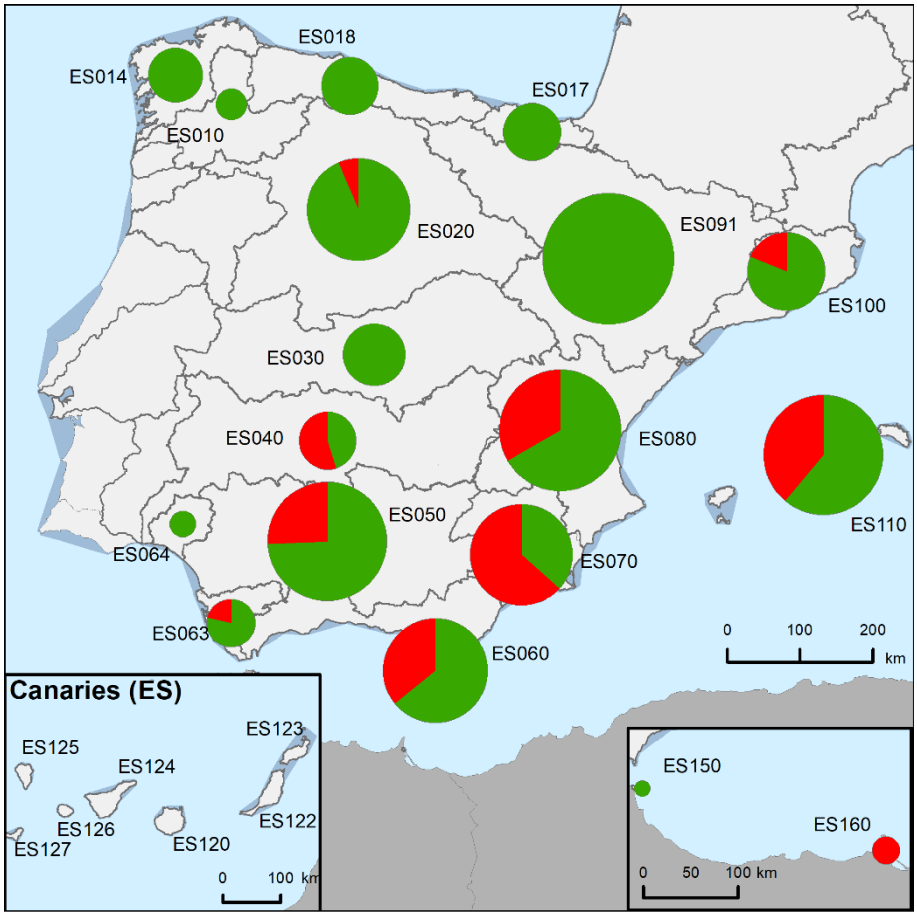
In total 179 of 729 groundwater bodies are at risk of failing good quantitative status. Risk is mainly related to harm to actual or potential legitimate uses or functions of groundwater (127 groundwater bodies) and 49 due to deterioration or damage of aquatic or terrestrial ecosystems.

Map 5.1 displays the quantitative status of groundwater bodies based on the most recently assessed status.

Figure 5.2 shows the confidence in status classification.

[44] Spain subsequently clarified that there was an interpretation error (report of impact vs. report on the use of saline intrusion test). Thus, the reported information is not fully correct and the test has been applied in RBDs which are islands or have coast lines.

Map 5.1 Map of the most recently assessed quantitative status of groundwater bodies*



Good
Poor
Unknown
River Basin Districts
Countries outside the EU

Note: Standard colours based on WFD Annex V, Article 2.2.4.

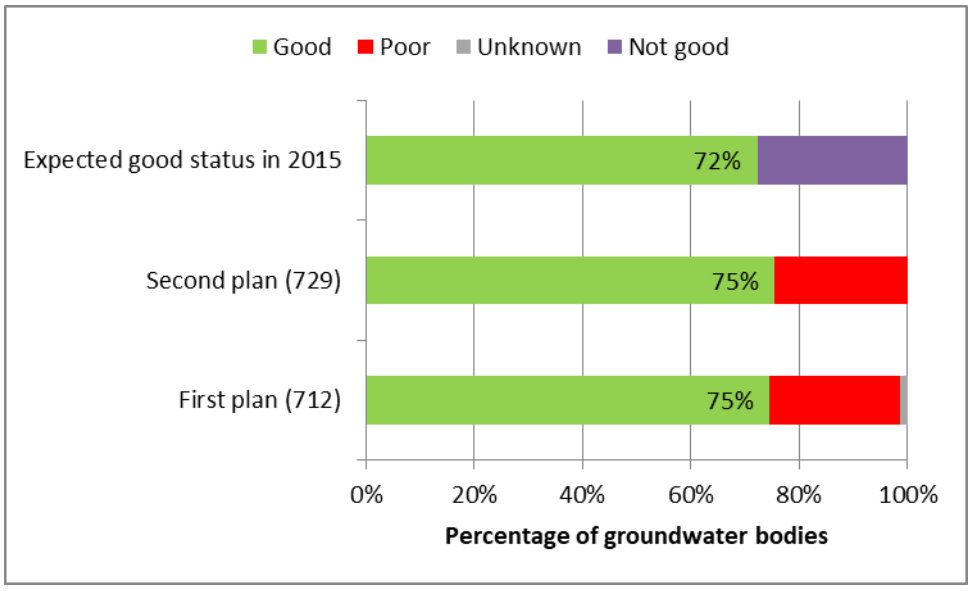
*Source: WISE, Eurostat (country borders)(*For the Ebro RBD there is one groundwater body at poor status, which proportion is too small to show up in the pie chart. The scale of pie charts of Ceuta and Melilla have been altered for better visilibity).*

5.1.3 Consideration of groundwater associated surface waters and/or groundwater dependent ecosystems

Groundwater associated surface waters have been partially considered in quantitative status assessment. In the Jucar and Catalan RBDs, groundwater associated aquatic ecosystems have not been reported.[45]

In 88 groundwater bodies of five RBDs groundwater dependent terrestrial ecosystems were identified[46]. Groundwater dependent terrestrial ecosystems have not been considered in status assessment in all RBDs where such ecosystems were reported to exist, but there is no risk associated.

Figure 5.1 Quantitative status of groundwater bodies in Spain for the second RBMP, for the first RBMP and expected in 2015. The number in the parenthesis is the number of groundwater bodies for both cycles. Note the period of the assessment of status for the second RBMP was 2002 to 2014. The year of the assessment of status for first RBMP is not known[47]



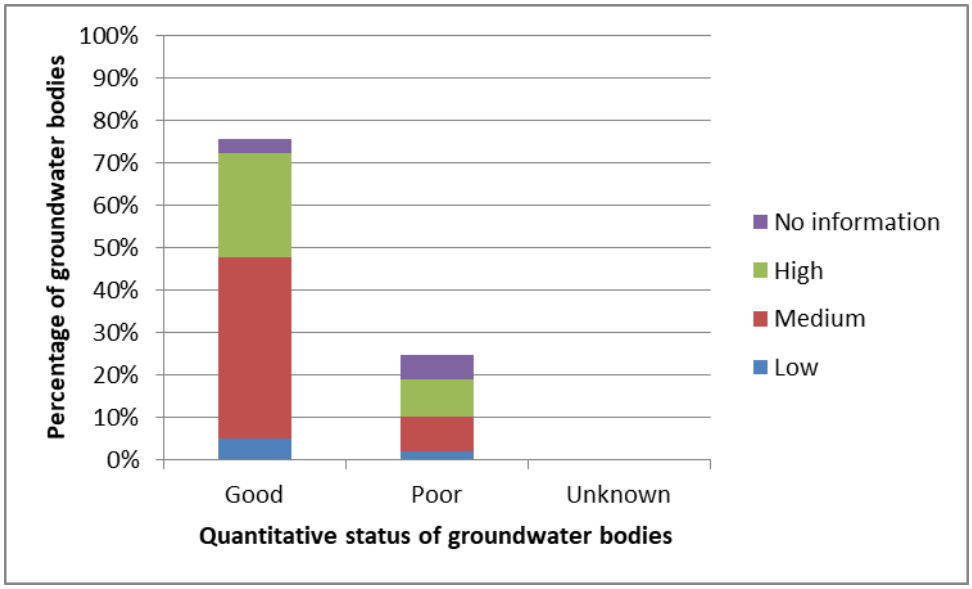
Source: WISE electronic reporting

[45] Spain subsequently clarified that there was an error in the reporting and groundwater associated surface waters and/or groundwater dependent ecosystems have been considered in quantitative status assessment, and that the information can be found in the RBMPs. (For instance in the Duero RBMP, annex 8.2, chapter 6.1.2. p.88, Jucar. Annex 12 of the memory, chapter 4.3.3, p.197, or Guadiana RBMP, annex 9, chapter 5.1.2, p. 125).

[46] Spain subsequently clarified that the correct information should be that in 275 groundwater bodies of 14 RBDs groundwater dependent terrestrial ecosystems were identified.

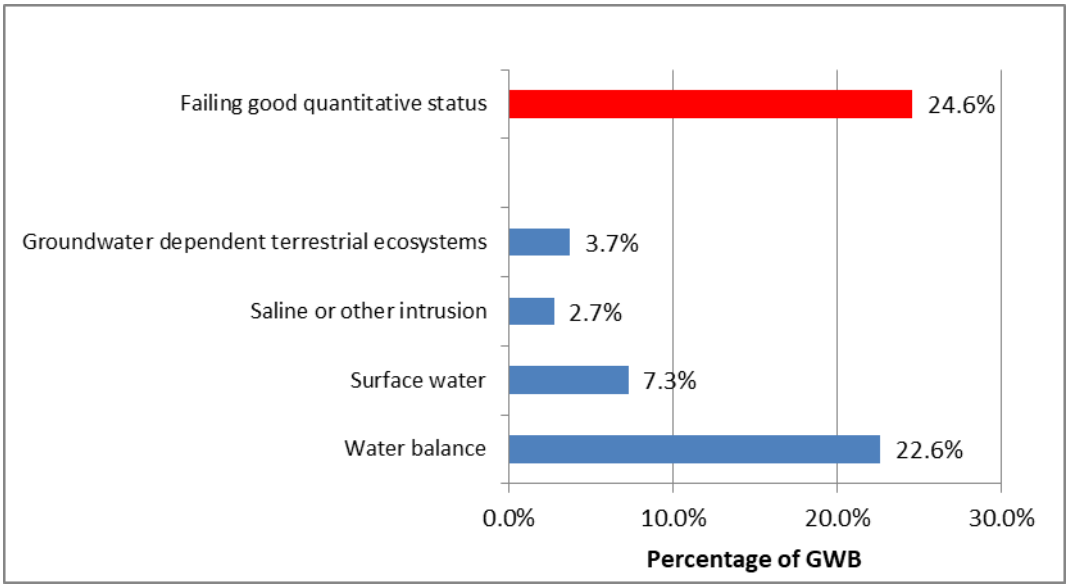
[47] Spain subsequently indicated that the "expected good status in 2015" should be 75 %.

Figure 5.2 Confidence in the classification of quantitative status of groundwater bodies in Spain based on the most recent assessment of status



Source: WISE electronic reporting

Figure 5.3 Reasons for the failure of good quantitative status of groundwater in Spain based on the most recent assessment of status



Source: WISE electronic reporting

Notes:

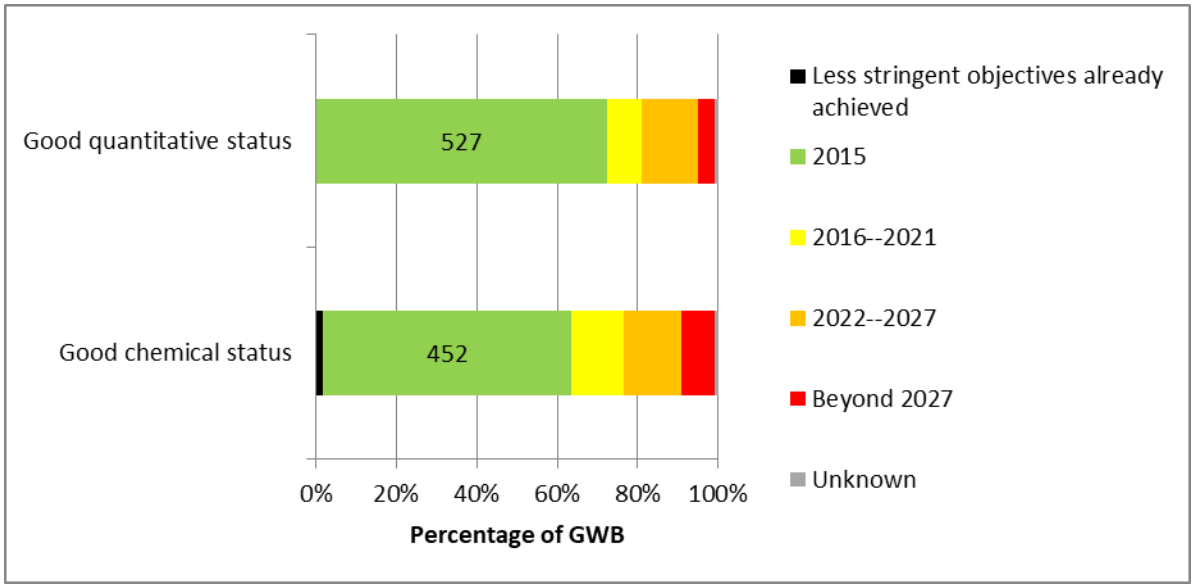
'Water balance' = long-term annual average rate of abstraction exceeds the available groundwater resource which may result in a decrease of groundwater levels.

'Surface water' = Failure to achieve Environmental Objectives (Article 4 WFD) for associated surface water bodies resulting from anthropogenic water level alteration or change in flow conditions; significant diminution of the status of surface waters resulting from anthropogenic water level alteration or change in flow conditions.

'Groundwater dependent terrestrial ecosystems' = Significant damage to groundwater dependent terrestrial ecosystems resulting from an anthropogenic water level alteration.

'Saline or other intrusion' = Regional saline or other intrusions resulting from anthropogenically induced sustained changes in flow direction.

Figure 5.4 Expected date of achievement of good quantitative and good chemical status of groundwater bodies in Spain. 729 groundwater bodies delineated for second RBMP[48]



Source: WISE electronic reporting

5.2 Main changes in implementation and compliance since the first cycle

The assessment of RBMPs and background documents revealed that basically no changes or updates where explicitly described in the RBMPs. For example Jucar reported that no significant changes have been undertaken as the first RBMP was approved very recently.[49]

Overall, the number of monitored groundwater bodies remained the same but with significant changes at RBD level. 701 groundwater bodies remained unchanged since the first RBMP. In Eastern Cantabrian the number of groundwater bodies decreased significantly and in Guadalquivir it increased significantly.

[48] Spain subsequently indicated that the "good quantitative status in 2015" should be 561 and "good chemical status" should be 467 groundwater bodies.

[49] Spain subsequently indicated that the assessment of the quantitative status of groundwater bodies between planning cycles is very similar, but some updates have been recorded in the RBMPs: All groundwater bodies have received a diagnosis of their quantitative assessment and there is an improved assessment of the quantitative status of groundwater bodies compared to the first cycle. The new assessment has been carried out considering all the relevant criteria (such as water balance tests, surface flow test, test on land ecosystems dependent on groundwater bodies and saline intrusion tests among others).

The number of monitoring sites increased by approximately 10 % but it has to be considered that in the first RBMP monitoring sites have been reported for 16 RBDs and in the second RBMP for 18 of 25 RBDs. Comparing the 16 RBDs where information is available for both RBMPs, the number increased by 15 %. Now all of these RBDs are subject to operational monitoring, but not for all groundwater bodies[50].

The overall status situation improved: for the RBDs for which information is also available from the first RBMP, the number of groundwater bodies failing good quantitative status declined slightly. The assessment of RBMPs and background documents revealed that significant changes (±10 %) are only present in few RBDs. In one RBMP, it is mentioned that due to new hydrogeological information and the consideration of land-use criteria 23 groundwater bodies have either been divided or extended and one groundwater body is new. Seven groundwater bodies have not been changed.

5.3 Progress with Commission recommendations

- Recommendation: *Ensure that the assessment of groundwater quantitative status considers all aspects of the definition, including local falls in the water table that may lead to a risk in water-dependent ecosystems, and including protected areas.*

  Assessment: The recommendation to establish quantitative monitoring was completely fulfilled in Guadalete and Barbate, Tinto, Odiel and Piedras and the Andalusian Mediterranean Basins. Ceuta and Melilla have not reported on this issue yet and progress cannot be assessed.[51] It is to be noted that an assessment of the progress of this recommendation for other river basin districts that have reported quantitative problems was not carried out, and cannot be considered fulfilled.

  The recommendation regarding the status assessment to consider all aspects of the definition is not fulfilled. Yet, Spain subsequently indicated that a complete assessment of groundwater quantitative status considering all aspects of the definition was carried out in 8 of the 18 RBDs reported. There are still 85 groundwater bodies (12 %) without monitoring of water levels. For Jucar the water balance method was not reported. In Jucar and in Catalan RBDs deterioration of the status of associated surface waters has

[50] Spain subsequently clarified that although the result of the assessment of the quantitative status of groundwater bodies does not show remarkable differences between planning cycles, there have been some important improvements. In this 2nd cycle all groundwater bodies have received a diagnosis of their quantitative assessment and the new assessments have been carried out considering all the relevant criteria (such as water balance tests, surface flow test, test on land ecosystems dependent on groundwater bodies and saline intrusion tests among others).

[51] Spain subsequently clarified that for Ceuta and Melilla monitoring sites are under study.

not been reported. In Duero, Jucar and in Catalan RBD the damage to groundwater dependent terrestrial ecosystems has not been reported. The saline intrusion test was not reported for some RBDs which are islands or have coastal areas.[52]

Having taken into consideration the lack of information and indicated reporting errors, this recommendation is still considered as partially fulfilled given the identified gaps.

[52] As previously indicated, Spain subsequently clarified that there were errors in in the reporting related to these tests.

Topic 6 Monitoring, assessment and classification of chemical status of groundwater bodies

6.1 Assessment of implementation and compliance with WFD requirements in the second cycle

6.1.1 Monitoring of chemical status in groundwater

The total number of groundwater bodies in Spain is 729 (Table 2.3)[53]. In total 250 groundwater bodies are not subject to surveillance monitoring (Table 5.1). In Eastern Cantabrian, Guadiana, Guadalquivir, Balearic Islands, Ceuta and Melilla no surveillance monitoring at all is established although groundwater bodies at risk exist. Not all groundwater bodies at risk are subject to operational monitoring[54]. In total 398 groundwater bodies (55 %) are at risk and 402 groundwater bodies are subject to operational monitoring, but at RBD level in three RBDs (Duero, Segura, Catalan RBDs) the number of groundwater bodies at risk is higher than those under operational monitoring which suggest there is room for improvement. The assessment of RBMPs and background documents found indications that grouping of groundwater bodies was applied, but not in all assessed RBMPs. No information on the grouping methodology and the considered elements was found in the RBMPs. The coverage of groundwater bodies by monitoring is not complete, neither for surveillance monitoring nor for operational monitoring.

The number of groundwater bodies decreased from 748 in the first RBMP to 729 in the second RBMP and the total groundwater body area remained nearly the same. 701 groundwater bodies remained unchanged since the first RBMP. In Eastern Cantabrian the number decreased from 28 to 20 and in Guadalquivir the number increased from 60 to 86.

The number of groundwater bodies with surveillance monitoring decreased from 624 in the first RBMP to 479 in the second RBMP. The number of monitoring sites in the second cycle is listed in Table 5.3 (see Chapter 5). The number of surveillance monitoring sites in the first cycle RBMP was 2 893, a significant decrease from the 2 395 in the second RBMP. The sites are located in 479 out of 729 groundwater bodies. The number of operational monitoring sites has increased significantly since the first RBMP, from 2 375 to 2 725.

[53] It has to be considered that the first RBMPs information includes the groundwater bodies of the Canary Island RBDs, but they have not been reported for the second RBMP.

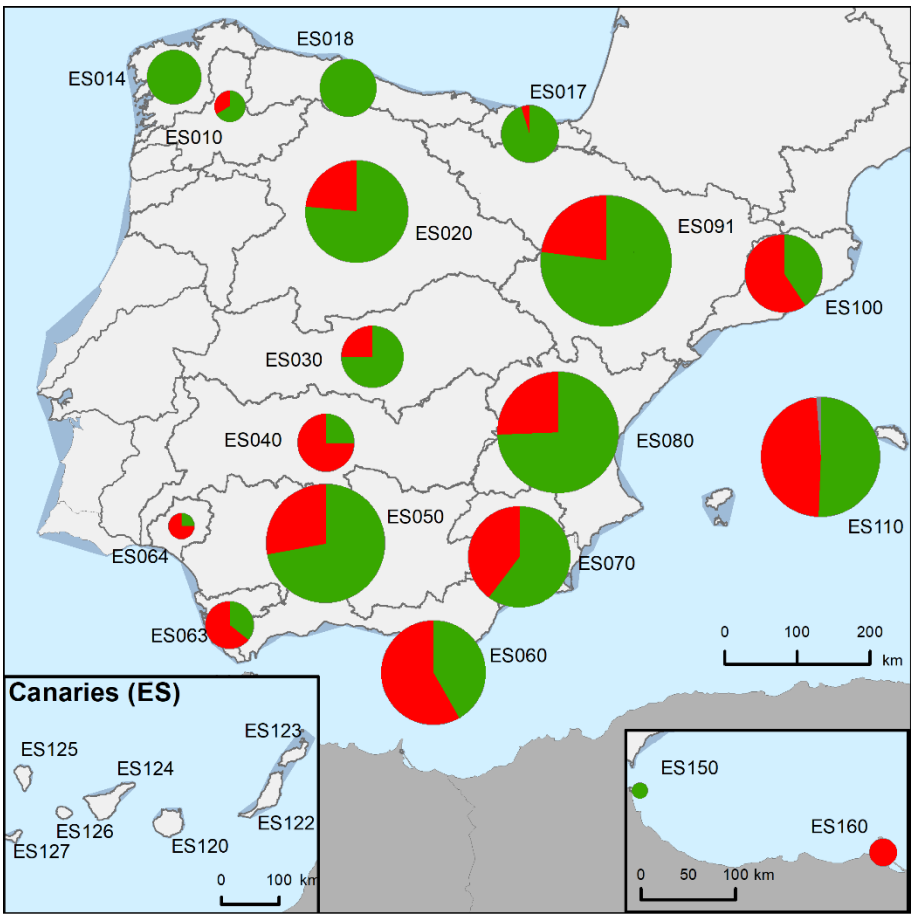
[54] Spain subsequently clarified that if there is a groundwater body at risk, the associated monitoring is operational. There is a reporting mistake as all the groundwater bodies at risk included in the Guadiana RBMP are subject to operational monitoring while those not at risk are subject to surveillance monitoring. In the case of Eastern Cantabrian, the only groundwater body at risk has 16 operational monitoring points, which should have been reported as surveillance monitoring points.

A considerable number of substances at risk of causing deterioration in chemical status are not subject to surveillance and operational monitoring in all relevant groundwater bodies. All WFD core parameters nitrate, ammonium, electrical conductivity, oxygen and pH are monitored in seven of 16 RBDs. In the remaining RBDs some parameters are not monitored.

6.1.2 Assessment and classification of chemical status in groundwater

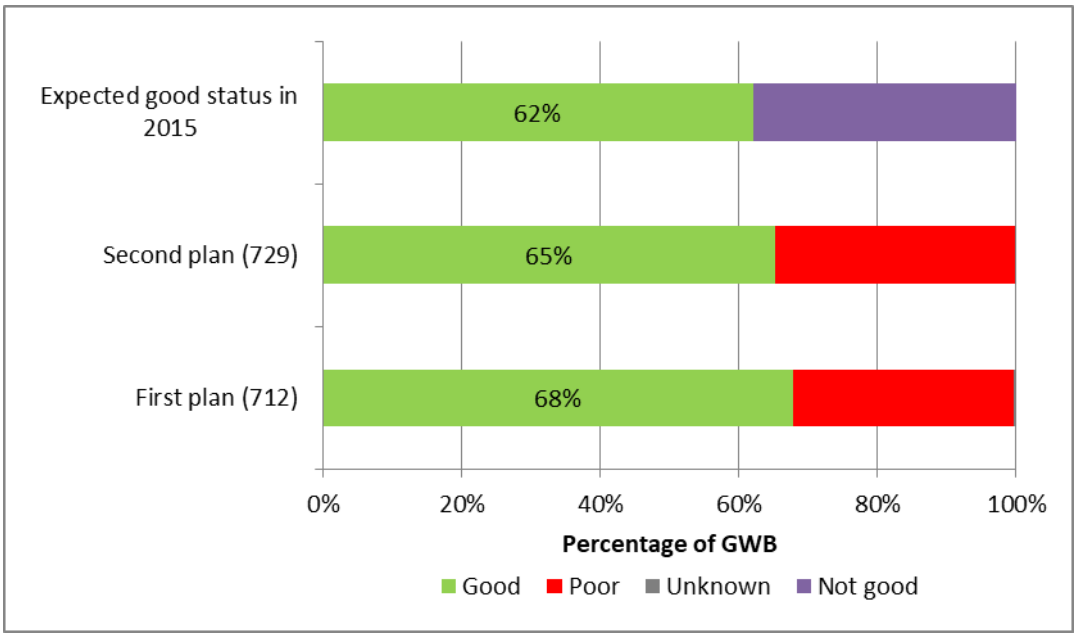
Map 6.1 and Figure 6.1 display the most recently assessed chemical status of groundwater bodies. It shows that 475 of 729 groundwater bodies (65 %) are of good chemical status, 253 groundwater bodies (35 %) are failing good status and one groundwater body is of unknown status (Balearic Islands RBMP). In terms of area this means that about 31 % is failing good chemical status. Figure 6.2 shows the confidence in status classifications. The number of groundwater bodies in unknown status declined from eight in the first to one in the second RBMP.

Map 6.1 ***Map of the most recently assessed chemical status of groundwater bodies in Spain***



Note: Standard colours based on WFD Annex V, Article 2.4.5.
Source: WISE, Eurostat (country borders)

Figure 6.1 Chemical status of groundwater bodies in Spain for the second RBMP, for the first RBMP and expected in 2015. The number in the parenthesis is the number of groundwater bodies for both cycles. Note the period of the assessment of status for the second RBMP was 2012 to 2014. The year of the assessment of status for first RBMP is not known



Source: WISE electronic reporting

The total number of groundwater bodies failing good chemical status slightly increased since the first RBMP from 251 (32 %) to 253 (35 %) groundwater bodies (see Figure 6.1) (from 30 % to 31 % of the total groundwater body area). The expected date of achievement of good chemical status in Spain is shown in Figure 5.4 (see Chapter 5).

The reasons for the failure of good chemical status of groundwater bodies are shown in Figure 6.3. For 232 groundwater bodies the general assessment of the chemical status for the groundwater body as a whole failed. This assessment considers the significant environmental risk from pollutants across a groundwater body and a significant impairment of the ability to support human uses. 57 groundwater bodies are failing the drinking water test which means that the requirements of drinking water protected areas have not been met. 52 groundwater bodies are failing good chemical status due to saline or other intrusion. 41 groundwater bodies are failing the groundwater associated surface water test which means that there is diminution of the status of groundwater associated surface water. 34 groundwater bodies are failing the groundwater dependent terrestrial ecosystem test which means that there is damage to

groundwater dependent terrestrial ecosystems. Figure 6.4 shows the top 10 pollutants causing failure of status, and Figure 6.5 shows the pollutants causing a sustained upward trend.

The calculation of the extent of exceedance of a groundwater quality standard or a groundwater threshold value[55] is in six RBDs based on the number of monitoring sites in the groundwater body, in three RBDs based on the groundwater body area and for seven RBDs it is not clear how the extent of exceedance of a groundwater quality standard or a groundwater threshold value was calculated as 'other' method was reported. For one RBD no method was reported although two groundwater bodies are at risk and fail good status.

In five RBDs, groundwater threshold values have not been established for all pollutants or indicators of pollution causing a risk of failure of good chemical status.[56] The assessment of RBMPs and background documents did not reveal any related explanation for that but showed that that all Groundwater Directive[57] Annex II Part B substances were considered in threshold value establishment but there are differences between the RBMPs assessed.

In 14 RBDs[58] natural background levels have been considered in the groundwater threshold value establishment. In two RBDs, they have been considered in status assessment but in two of 18 RBDs (Western Cantabrian and Ebro) natural background levels have not been considered in the establishment of groundwater threshold values.

A trend methodology is available and assessments have been performed in five of 18 RBDs.

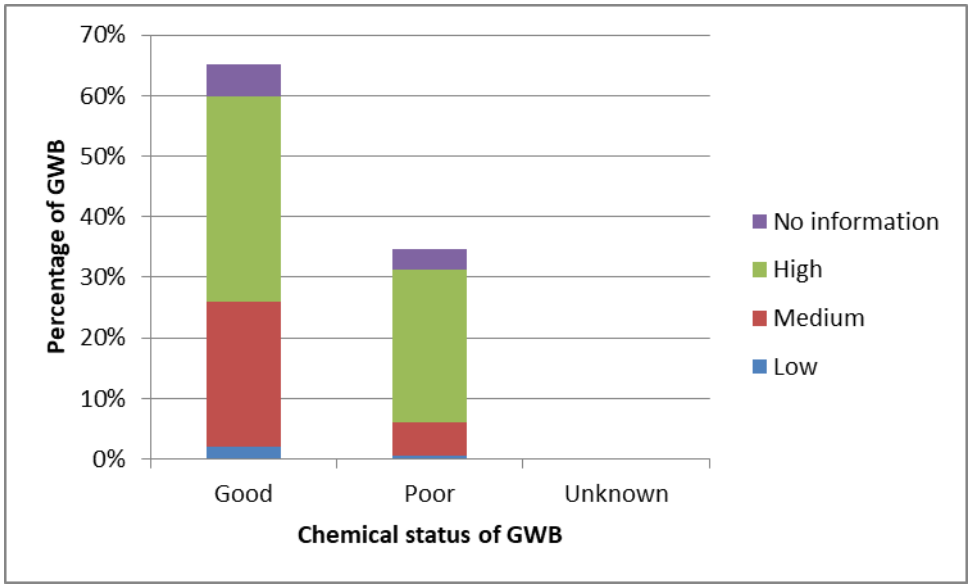
[55] Threshold values are quality standards that have to be set by Member States for pollutants causing a risk of not meeting WFD requirements.

[56] Spain subsequently clarified, that there must have been a reporting error because threshold values have been established in all RBDs.

[57] Directive 2006/118/EC of the European Parliament and of the Council of 12 December 2006 on the protection of groundwater against pollution and deterioration http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:02006L0118-20140711.

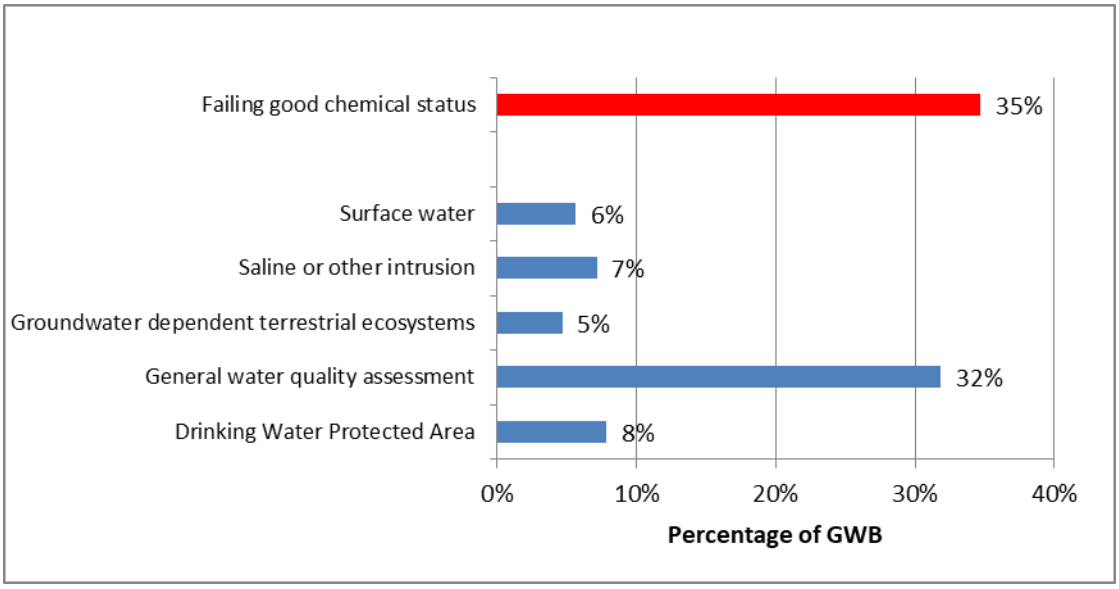
[58] Spain subsequently clarified that there are 15 RBDs where natural background levels have been considered.

Figure 6.2 Confidence in the classification of chemical status of groundwater bodies in Spain based on the most recent assessment of status



Source: WISE electronic reporting

Figure 6.3 Reasons for failing good chemical status in Spain for the most recent assessment of status



Source: WISE electronic reporting

Notes:

'Surface water' = Failure to achieve Environmental Objectives (Article 4 WFD) in associated surface water bodies or significant diminution of the ecological or chemical status of such surface water bodies.

'Groundwater dependent terrestrial ecosystems' = Significant damage to terrestrial ecosystems which depend directly on the groundwater body.

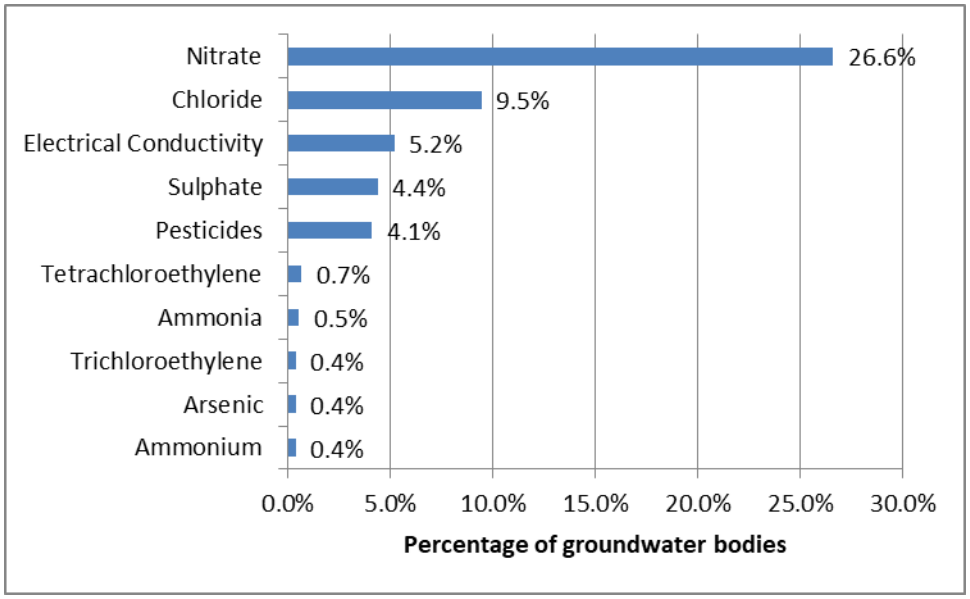
'Saline or other intrusion' = Regional saline or other intrusions resulting from anthropogenically induced

sustained changes in flow direction.

'Drinking Water Protected Area' = Deterioration in quality of waters for human consumption.

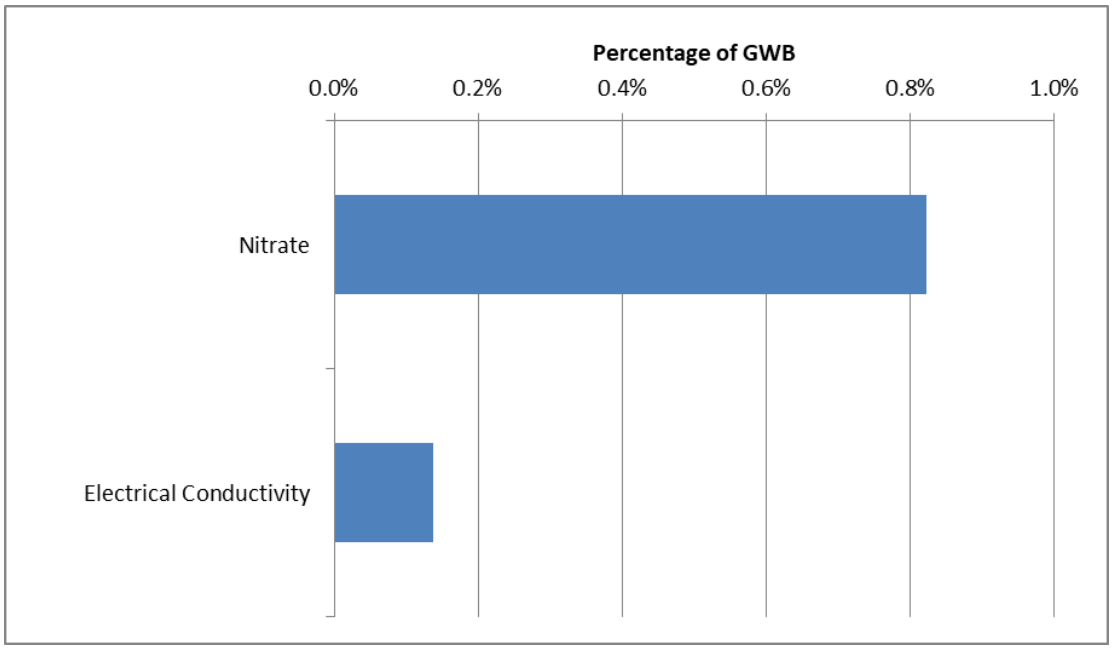
'General water quality assessment' = Significant impairment of human uses; significant environmental risk from pollutants across the groundwater body.

Figure 6.4 Top 10 groundwater pollutants causing failure of good chemical status in Spain



Source: WISE electronic reporting

Figure 6.5 Most common pollutants with upward trends in groundwater bodies in Spain



Source: WISE electronic reporting

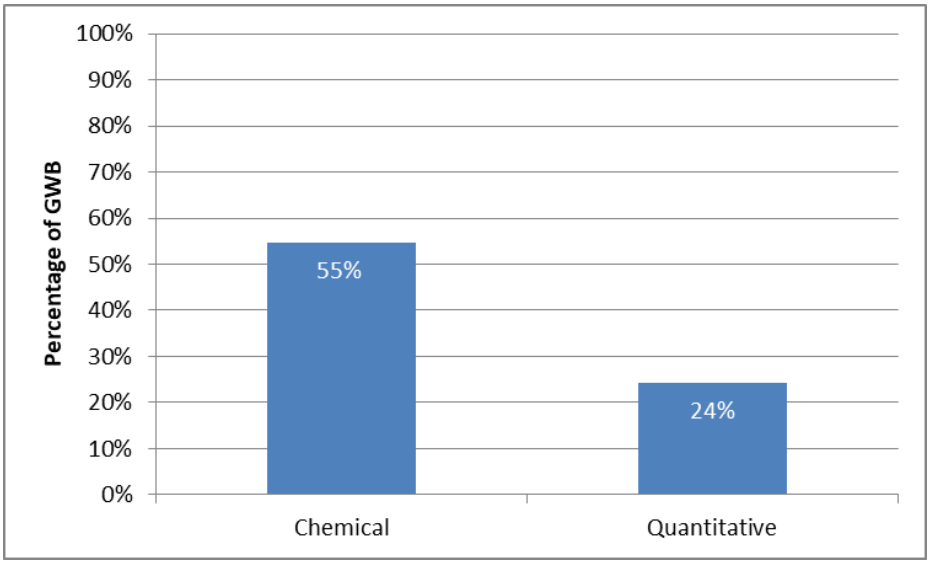
6.1.3 Consideration of groundwater associated surface waters and/ or groundwater dependent ecosystems

In 13 of 18 RBDs surface water bodies are associated to groundwater bodies, in seven RBDs a related risk is indicated and 41 groundwater bodies are failing good chemical status. These aquatic ecosystems have been considered in status assessment in all RBDs, apart from Balearic Islands.

In 14 of 18 RBDs, groundwater dependent terrestrial ecosystems were identified, in seven RBDs a related risk is indicated and 34 groundwater bodies are failing good chemical status. Groundwater dependent terrestrial ecosystems have been considered in status assessments in all RBDs.

Groundwater associated aquatic ecosystems and groundwater dependent terrestrial ecosystems have been partially considered in the establishment of groundwater threshold values. In Duero, Guadiana, Ebro and Balearic Islands groundwater associated aquatic ecosystems have not been considered[59] although they exist and cause a risk. In Guadiana, Ebro and Balearic Islands groundwater dependent terrestrial ecosystems have not been considered although they exist and cause a risk.

Figure 6.6 Percentage of groundwater bodies in Spain at risk of failing good chemical status and good quantitative status for the second RBMP



Source: WISE electronic reporting

[59] Spain subsequently clarified that there must have been a reporting error as Duero, Guadiana, Ebro and Balearic Islands considered groundwater associated aquatic ecosystems.

6.2 Main changes in implementation and compliance since the first cycle

The number of groundwater bodies slightly decreased although the total groundwater body area remained nearly the same. 701 of 729 groundwater bodies remained unchanged since the first RBMP. Spain subsequently clarified that the decrease observed could be because of the counting number of the groundwater bodies in Canary Islands, but they have not been reported for the second RBMP. Spain also mentioned that in fact the number of groundwater bodies has increased.

The monitoring situation deteriorated: the number of groundwater bodies covered by surveillance monitoring dropped significantly and the coverage of groundwater bodies at risk by operational monitoring is not complete. Spain subsequently clarified that there were some errors in the reported information for both cycles, this being particularly evident in the first RBMP and the number of operational monitoring sites has increased (18 %) since the first RBMP, which reflects the effort made in order to complete the monitoring of the groundwater bodies at risk.

The chemical status situation did not improve and 31 % of the total groundwater body area is still failing good chemical status.

The initial assessment for the Guadiana RBD showed that three groundwater bodies changed status from good to poor. However, Spain subsequently clarified that there is in fact only one groundwater body that changed from good to poor.

The Guadalquivir RBD describes the methodological approach e.g. for groundwater body characterisation (including the modelling tools used), and the calculation of nitrates objectives has changed from the previous cycle. No other changes are reported. As there are 26 new groundwater bodies, the surveillance network has increased in terms of water bodies monitored (but not the operational network).

The Jucar RBMP reports that the trend analysis of pollutants has changed, considering not only one year (2010, in the previous plan) but a timespan 2010–2013.

The Balearic Islands RBMPs did not report any changes in the characterisation except for a lower number of groundwater bodies (no explanation was provided). Similarly, although there was a significant increase of monitoring stations, no explanation was provided regarding the motivation for this. No explanation is provided for the increase in the number of groundwater bodies at poor chemical status. The chemical status has been judged on the basis of 2006–2012

data on chloride and nitrate, and it is recognised that many groundwater bodies still do not have a monitoring station.

6.3 Progress with Commission recommendations

The Commission recommendations based on the first RBMPs and first Programme of Measures requested action on the following:

- Recommendation: "*Monitoring gaps should be filled (hydromorphological parameters; analytical methods for priority substances and other pollutants, including the use of biota monitoring where relevant to overcome problems with limits of detection; monitoring methodologies to identify groundwater pollution trends, etc.).*"

  Assessment: A trend methodology is available and assessments have been performed in five of 18 river basin districts. This recommendation is considered partially fulfilled.

Topic 7 Designation of Heavily Modified and Artificial Water Bodies and definition of Good Ecological Potential

7.1 Assessment of implementation and compliance with WFD requirements in the second cycle for designation

7.1.1 Designation of Heavily Modified and Artificial Water Bodies

In the second planning cycle, heavily modified water bodies are reported so far for 18 RBDs. For the first cycle, 16.8 % of river water bodies were designated as heavily modified, while in the second cycle the percentage of heavily modified as a proportion of total river water bodies has increased to 20 %. Overall, there are no widespread changes to the level of designation of heavily modified water body and artificial water body since the first RBMPs, but there are some RBD-specific issues which are outlined in Chapter 7.2.

In 16 out of 18 RBDs, there are designated river heavily modified water bodies which are reservoirs and were originally rivers. In three out of 18 RBDs, there are lake heavily modified water bodies designated, which are reservoirs and were originally lakes.

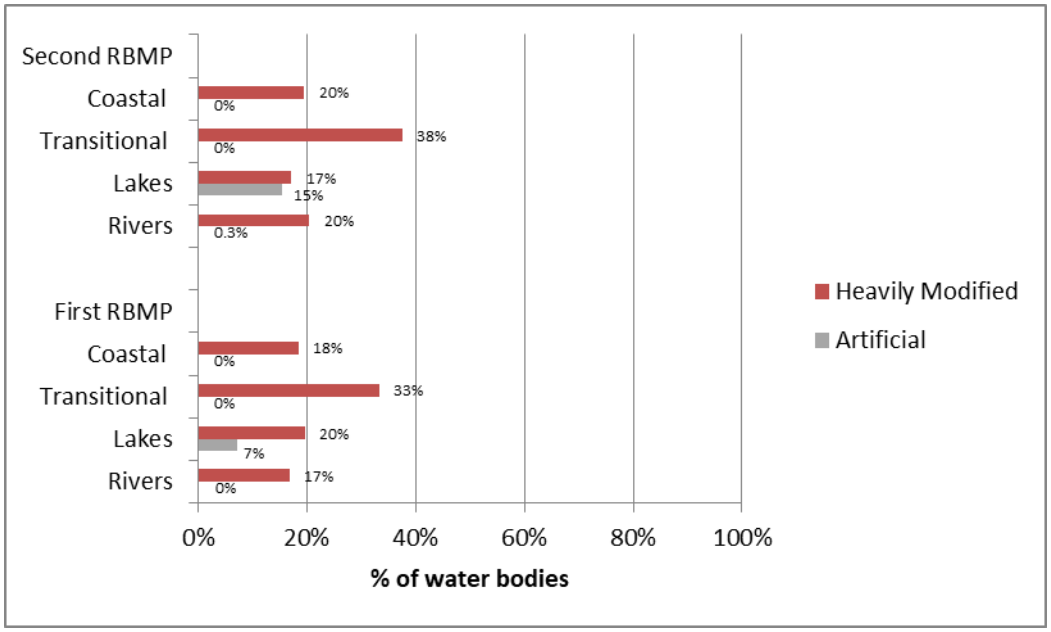
The main water uses for which river water bodies are designated as heavily modified water bodies are hydropower production, flood protection, drinking water supply for urban areas as well as irrigation for agriculture. In some RBDs, several heavily modified water bodies are also designated due to tourism and recreational uses.

For lake water bodies, the main water uses for designation as heavily modified water body are hydropower production, irrigation for agriculture and tourism/recreation. For coastal water bodies heavily modified water body designation is mainly related to navigation / ports. For transitional heavily modified water bodies, the main water uses are flood protection, navigation / ports, tourism / recreation, agricultural land drainage and the wider environment.

The main physical alterations of river heavily modified water bodies are channelisation / straightening / bed stabilisation / bank reinforcement and weirs / dams / reservoirs. For lake heavily modified water bodies, the main alterations are weirs / dams / reservoirs; for coastal heavily modified water bodies, land reclamation / coastal modifications / ports and for transitional heavily modified water bodies, channelisation / straightening / bed stabilisation / bank reinforcement and land reclamation / coastal modifications / ports.

The second RBMPs include assessments of the significant adverse effects of measures on the use and wider environment and an assessment of better environmental options on the level of water bodies. However, no criteria and thresholds to define what is significant or not significant are provided in the RBMPs or the methodological documents.

Figure 7.1 Proportion of total water bodies in each category in Spain that has been designated as heavily modified or artificial



Source: WISE electronic reporting

7.1.2 Definition of Good Ecological Potential for Heavily Modified and Artificial Water Bodies

Good ecological potential is reported as defined in the 18 reported RBDs. In 14 out of 18 RBDs, the Common Implementation Strategy Guidance approach (approach based on biological quality elements as illustrated in Common Implementation Strategy Guidance Document No 4) has been applied to define good ecological potential. In the remaining four RBDs (Guadalquivir, Segura, Ceuta, Melilla), a hybrid approach combining elements of the Common Implementation Strategy Guidance and the Prague approach (based on the identification of mitigation measures) has been used.

Good ecological potential is defined at water body level in 12 out of 18 RBDs. In six RBDs, good ecological potential is defined for groups of heavily modified water bodies /artificial water bodies of the same use/physical modification.

There is a specific national method for defining good ecological potential of reservoirs and ports, which is a national regulation that establishes criteria for monitoring and status assessment in surface water bodies. Differentiations in the methodology are provided for specific categories in different RBDs, e.g. in the RBD Guadalquivir, a method has been developed for good ecological potential in transitional waters, while for rivers downstream of reservoirs, the method is not clear and is considered as provisional until specific studies are developed. For good ecological potential of lake heavily modified water bodies, the same method is used as for good ecological status of natural water bodies. In the Segura RBD, specific methods to define good ecological potential for channelised rivers and for lakes are reported.

Good ecological potential is reported to have been defined in terms of biology in 16 out of 18 reported RBDs (good ecological potential has not been defined in terms of biology in Ceuta and Melilla). Biological quality elements for which biological values have been derived to define maximum ecological potential and good ecological potential are reported; these differ for the various RBDs but the one reported for all RBDs is phytoplankton. Biological values to define maximum ecological potential / good ecological potential for benthic invertebrates have been derived in 15 out of 16 RBDs. Biological values to define maximum ecological potential / good ecological potential for fish have been derived in seven out of 16 RBDs.

For most RBDs the RBMPs include information on whether actual values for biological quality elements are estimated or not for good ecological potential, including for reservoirs and ports, for which values for phytoplankton are defined at national level. In the Segura RBD, values are given for phytobenthos and benthic invertebrates for channelised rivers and for phytoplankton and macrophytes in lakes. In the Jucar RBMP the additional class change limits have been identified.

Various biological quality element assessment methods which are sensitive to hydrological and morphological changes are reported for all water categories. Sensitive methods to both hydrological and morphological changes are in place in rivers for benthic invertebrates, phytobenthos, fish phytoplankton, other aquatic flora and macrophytes), in lakes (for macrophytes, phytoplankton and benthic invertebrates) in coastal waters (for phytoplankton, benthic invertebrates, macroalgae and angiosperms) and in transitional waters (for phytoplankton, benthic invertebrates, fish and macrophytes).

Mitigation measures for defining good ecological potential have been reported for all 18 RBDs as well as the ecological changes expected due to those mitigation measures.

A comparison between good ecological potential and good ecological status has been done in six RBDs (Western Cantabrian, Duero, Andalusian Mediterranean Basins, Guadalete and Barbate, Tinto, Odiel and Piedras, Segura). In the other RBDs, there is no such comparison made.

7.2 Main changes in implementation and compliance since the first cycle

As indicated above, there are no widespread changes to the level of designation of heavily modified water bodies and artificial water bodies, but there are some RBD-specific issues to be indicated. Some of the consequences of these changes are discussed in the RBMPs. In the Miño-Sil RBD, there is a significant increase of designated river heavily modified water bodies from 49 to 68 (18 % to 25 % of all river water bodies). All RBMPs include an annex with the explanation on the designation process for all heavily modified and artificial water bodies.

In Eastern Cantabrian, the eight reservoirs were designated as heavily modified lake water bodies in the first cycle. In this second plan, with the aim of improving the characterisation of water bodies, these reservoirs have been included in the category of heavily modified river water bodies.

In Duero, there is a significant increase of designated river heavily modified water bodies from 80 to 208 (11 % to 30 % of all river water bodies). The RBMP explains that this change is due to a thorough review of heavily modified water bodies, especially due to hydrological and morphological alterations.

In Ebro, there is a significant increase of designated transitional heavily modified water bodies, from 3 to 13 (37 % to 81 % of transitional water bodies), due to the improvement of knowledge of transitional waters in the River Ebro Delta (boundaries, ecological status...).

There are three new artificial water bodies designated in the Guadiana and in the Andalusian Mediterranean Basins. In the first RBMPs, a full methodology for good ecological potential definition was missing. In the second cycle, there have been significant improvements regarding the methods for assessing the potential and establishing the GEP. As a result, the diagnosis probles have considerably been reduced. This progress is particularly relevant in the RBDs of Jucar, Guadiana, Tagus, and especially in the Ebro.

Furthermore, mitigation measures for the definition of good ecological potential have been reported in all 18 RBDs. The RBMPs include specific fact sheets for each heavily modified

water body with the expected ecological changes due to the application of those mitigation measures.

7.3 Progress with Commission recommendations

- Recommendation: *The designation of HMWBs should comply with all the requirements of Article 4(3). The assessment of significant adverse effects on their use or the environment and the lack of significantly better environmental options should be specifically mentioned in the RBMPs. This is needed to ensure transparency of the designation process.*

- Recommendation: *In the context of designation of HMWBs, develop clear criteria/thresholds to define the significant adverse effect of restoration measures on water uses, and a proper (real) assessment of other alternatives that could be better environmental options.*

  Assessment: In the first RBMPs, there were some gaps in the methodology for heavily modified water body designation. In the second RBMPs, it is noted that a water planning regulation with detailed methodology for heavily modified water body designation is in place. For the Balearic Islands RBD, the first cycle RBMP did not provide complementary information on the methodology for heavily modified water body designation, and this seems to be unchanged in the second cycle RBMP, which provides no information on such methodology. The RBMP of the Balearic Islands was being revised at the time of the publication of this report, and this issue may be updated.

  Concerning the methodology on the designation tests under WFD Articles 4(3)(a) and 4(3)(b), the second RBMPs include assessments of the significant adverse effects of measures on the use and wider environment and an assessment of better environmental options on the level of water bodies. However, no criteria and thresholds to define what are significant or not significant effects are provided in the RBMPs or in the methodological documents.

  This recommendation has been partially fulfilled.

- Recommendation: *Ensure that good ecological potential is correctly defined for all heavily modified water bodies and artificial water bodies (in terms of biological condition and mitigation measures).*

  Assessment: Good ecological potential is reported to be defined at water body level in 12 out of 18 RBDs, and is also defined in terms of biology in 16 out of 18 reported RBDs. According to the second RBMPs for most RBDs though, information is not entirely clear on whether actual values for biological quality elements are estimated or not for good ecological potential, except for reservoirs and ports, for which values for phytoplankton are defined at national level. Mitigation measures for defining good ecological potential have been reported for all 18 RBDs.

  This recommendation has been partially fulfilled.

Topic 8 Environmental objectives and exemptions

8.1 Assessment of implementation and compliance with WFD requirements in the second cycle

8.1.1 Environmental objectives

The environmental objectives are defined in Article 4 of the WFD. The aim is long-term sustainable water management based on a high level of protection of the aquatic environment. Article 4(1) defines the WFD general objective to be achieved in all surface and groundwater bodies, i.e. good status by 2015. Within that general objective, specific environmental objectives are defined for heavily modified water bodies (good ecological potential and good chemical status by 2015[60]), groundwater (good chemical and quantitative status by 2015) and for Protected Areas (achievement of the objectives of the associated Directive by 2015 unless otherwise specified).

Environmental objectives for ecological and chemical surface status have been reported in all RBDs as well as for good chemical and quantitative groundwater status, although for a number of water bodies (which represent only less than 2 % of the total), the date for the achievement of the objectives is unknown. Good ecological potential is defined and objectives for transitional waters and coastal waters are reported.

Member States are also required to specify additional environmental objectives and standards in Protected Areas where these are required to ensure that the requirements of the associated Directive are met. An assessment of such additional objectives for Spain is provided in Chapter 15 of this report.

Assessments of the current status of surface and groundwater bodies in Spain are provided elsewhere in this report: for ecological status/potential of surface waters (Chapter 3); chemical status of surface waters (Chapter 4); quantitative status of groundwater bodies (Chapter 5); chemical status of groundwater bodies (Chapter 6); status of surface and groundwater bodies associated with Protected Areas (Chapter 15).

For the second RBMPs, Member States are required to report the date when they expect each surface and groundwater body to meet its environmental objective. This information is

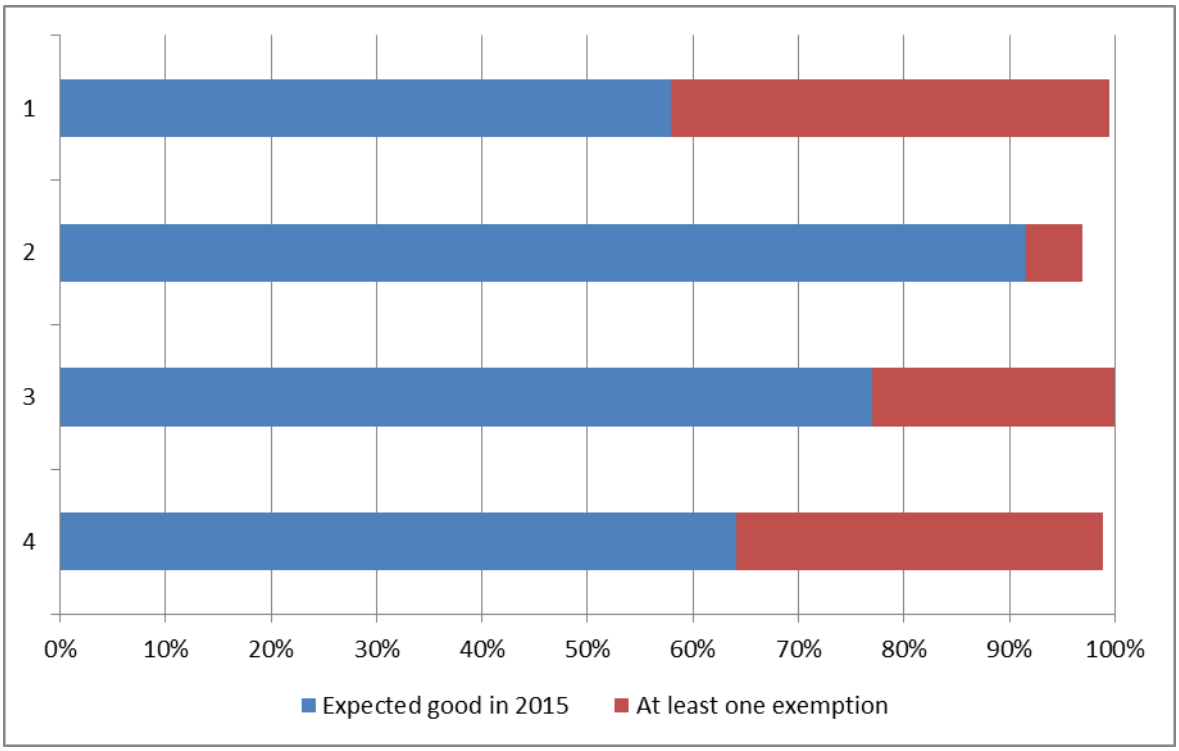
[60] For priority substances newly introduced by Directive 2013/39/EU, good status should be reached by 2027, and for the 2008 priority substances, for which the Environmental Quality Standards were revised by Directive 2013/39/EU, good status should be reached in 2021.

summarised for Spain elsewhere in this report: for ecological status/potential of surface waters (Chapter 3); chemical status of surface waters (Chapter 4); quantitative status of groundwater bodies (Chapter 5); chemical status of groundwater bodies (Chapter 6).

8.1.2 Exemptions

Where environmental objectives are not yet achieved, exemptions may be applied in case the respective conditions are met and the required justifications are explained in the RBMP. Figure 8.1 summarises the percentage of water bodies expected to be at least in good status in 2015 and the use of at least one exemption in Spain for the four main sets of environmental objectives.

Figure 8.1 ***Water bodies in Spain expected to be in at least good status in 2015 and use of exemptions. 1 = Surface water body ecological status/potential; 2 = Surface water body chemical status; 3 = Groundwater body quantitative status; 4 = Groundwater body chemical status***



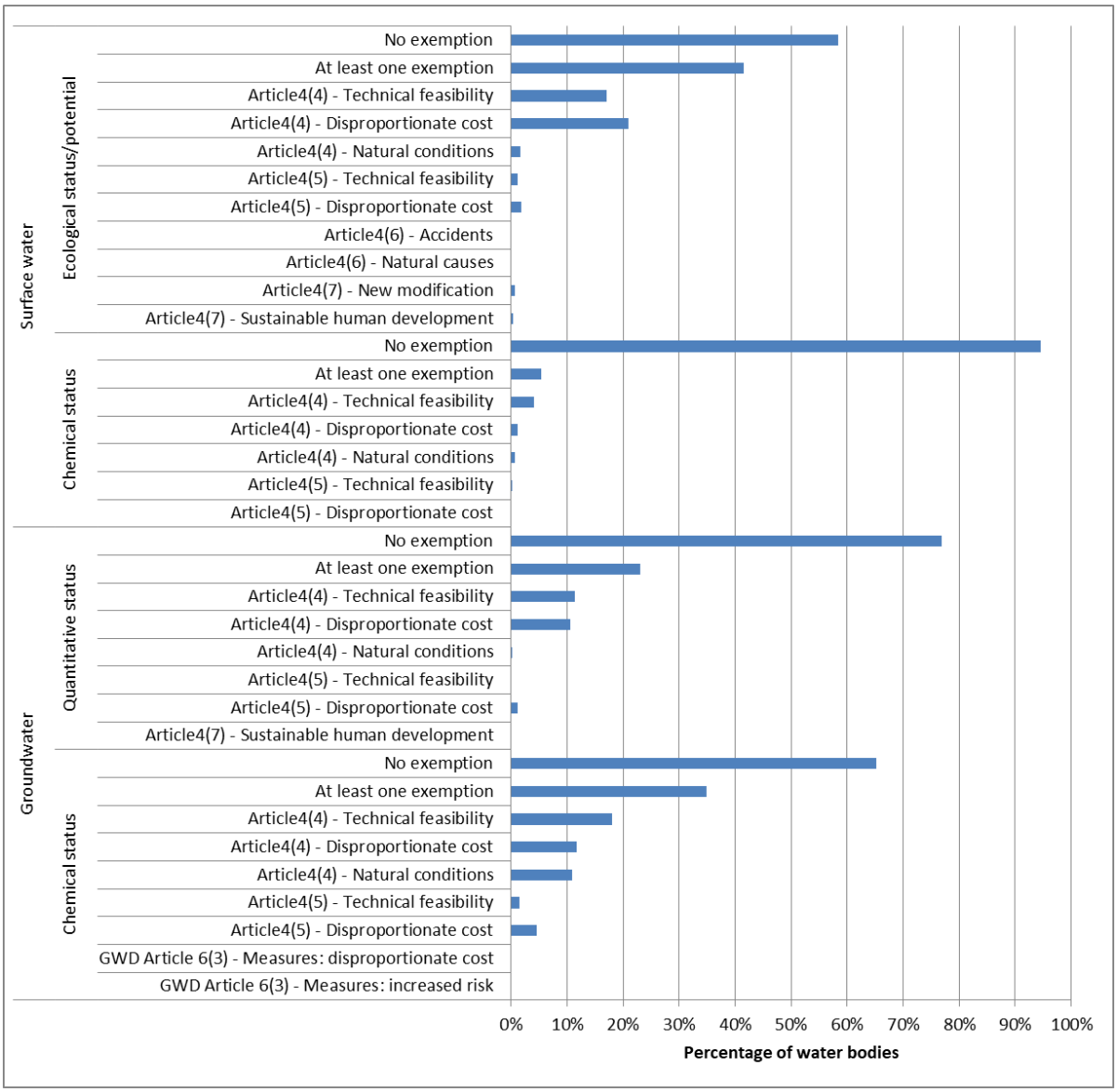
Source: WISE electronic reporting. For some water bodies the date for achievement of good status is unknown. Spain provided the following data: Expected good in 2015: Ecological: 57,8 % 2964 SW, Chemical SW: 91,5 % (4688 SW, Chemical GW: 64,1 % 467 GW, Quantitative: 77 % 561 GW, At least one exemption:, Ecological: 41,6 % 2132 SW, Chemical SW:5,4 % (278 SW, Chemical GW:34,8 % 254 GW, Quantitative:23 % 168 GW.

Article 4 of the WFD allows under certain conditions for different exemptions to the objectives: extension of deadlines beyond 2015; less stringent objectives; a temporary

deterioration, or deterioration non-achievement of good status / potential due to new modifications, provided a set of conditions are fulfilled. The exemptions under WFD Article 4 include the provisions in Article 4(4) - extension of deadline, Article 4(5) - lower objectives, Article 4(6) - temporary deterioration, and Article 4(7) - new modifications / new sustainable human development activities. Article 4(4) exemptions may be justified by: disproportionate cost, technical feasibility or natural conditions, and Article 4(5) by disproportionate costs or technical feasibility.

Figure 8.2 summarises the percentage of water bodies subject to each type of exemption (and reason) in relation to the four types of environmental objective in Spain.

Figure 8.2 ***Type of exemptions applied to surface water and groundwater bodies for the second RBMP in Spain. Note: Ecological status and groundwater quantitative status exemptions are reported at the water body level. Chemical exemptions for groundwater are reported at the level of each pollutant causing failure of good chemical status, and for surface waters for each Priority Substances that is causing failure of good chemical status***



Source: WISE electronic reporting

Application of Article 4(4)

The number of cases where Article 4(4) has been applied has increased in around two thirds of RBDs. Spain subsequently clarified that this is a consequence of the efforts to prioritise the use

of this exemption in order to limit the application of exemptions under Article 4(5) on setting less stringent objectives.

In the assessment of the first RBMPs, the justification was considered to be insufficient and referred for groundwater and surface water to technical feasibility, disproportionate costs and natural conditions for Article 4(4). In the second cycle, the justifications included have been improved, and these have been justified on the grounds of reasons of technical feasibility, disproportionate costs and natural conditions.

Disproportionate costs under Article 4(4) are used as a reason based on affordability, social and sectorial impacts and cost benefit ratios. The disproportionate costs are applied in a distinguished way between Articles 4(4) and 4(5), and Spain subsequently informed the Commission that further efforts are planned for the third cycle to improve the application and justification of this condition. The disproportionate costs are the reason for exemptions in 5 RBMPs, for both article 4(4) and 4(5). For example:

- The Guadiana RBMP includes an assessment of the paying capacity, which is briefly reflected in the water body exemption fiche and lists the costs (by "measure groups") of other basic and complementary costs identifying their costs against the paying capacity thresholds established.

- In the Ebro RBMP, a similar exercise has been undertaken. However, for one water body fiche analysed (water body 403 Río Ebro desde el río Oroncillo hasta el río Bayas), disproportionate costs and the justification for disproportional costs states that the average of investment per square km was much larger for this water body than for the average of the RBD in the past years; and water prices (due to modernisation) cannot be afforded by irrigators. However, these investments include complementary measures like irrigation modernisation (€9.7 m out of €13.7 m of the overall budget) and do not mention that these are partly covered by European Union funds (e.g. the European Agricultural Fund for Rural Development).

- The Guadalquivir RBMP provides a methodological explanation for disproportionate costs which is related to paying capacity. This capacity is based on one of the following criteria: i) related to the limit of 5 % of family expenses, ii) the limit of 5 % of economic revenues or iii) a limit of 70 EUR/inhabitant/year. It is stated that these criteria are based on Organisation for Economic Co-operation and Development and DEFRA experiences. In the fiches included in the RBMP, no specific references to data

or justification have been encountered for such paying capacity related to specific measures or water bodies.

Exemptions under Article 4(4) to good chemical status of groundwater bodies justified due to technical feasibility is being defined in the Guadalquivir RBMP by a modelling exercise. This has been developed with a tool called "PATRICAL", which explains that results will not be achieved within the current RBMP cycle timeline. The strengths and weaknesses of the PATRICAL system have not been further assessed in the frame of this compliance assessment. The specific exemption fiche for water body ES050MSBT000056900 (Osuna - La Lentejuela) additionally explains that the basic and complementary measures of the first cycle have been insufficient to achieve good status, and that due to their socio-economic impact, most of the measures are being implemented slowly.

In the Guadalquivir RBD, for a groundwater body with diffuse agricultural pollution pressure (e.g. ES050MSBT000052300 – Úbeda), a combined Article 4(4) exemption of technical feasibility and natural conditions has been applied. A brief textual explanation refers to the slow physical characteristics of this groundwater body, such as shown by the PATRICAL simulation tool. Similar texts have been drafted for other groundwater bodies. In the Ebro RBMP, the corresponding Annex does not include a description of how natural conditions are defined.

The pressures responsible for exemptions in surface water come from a broad range of activities including urbanisation, industry, agriculture, mining, abstraction and activities leading to changes in hydromorphology.

For groundwater, the main pressures responsible for exemptions are point and diffuse pollution from industry and agriculture. Abstraction is referred to in the Duero, Guadalquivir, Guadiana, Guadalete and Barbate, Jucar, Balearic Islands, Miño-Sil, Andalusian Mediterranean Basins, Segura, Catalan and Melilla RBDs.

The main drivers for exemptions are urban development, tourism and recreation, industry, flood protection, fisheries and aquaculture, energy and agriculture.

Application of Article 4(5)

The number of cases where Article 4(5) has been applied has increased in most RBDs. In the assessment of the first RBMPs, the justification was considered to be insufficient and referred for groundwater and surface water to technical feasibility, disproportionate costs for Article

4(5). In the second cycle, the justifications for the use of this exemption have been improved, and the reasons for exemptions are again technical feasibility and disproportionate costs.

Disproportionate costs under Article 4(5) are used as a reason based on affordability, social and sectorial impacts and cost benefit ratios. The disproportionate costs are applied in a distinguished way between Articles 4(4) and 4(5). The disproportionate costs are the reason for exemptions in five RBMPs, for both article 4(4) and 4(5).

Another surface water body (278 Río Linares desde su nacimiento hasta el inicio del tramo canalizado en la población de Torres del Río) faces high sulphate concentrations due to a geological gypsum riverbed, leading to the application of an Article 4(5) exemption, which is textually described in a fiche. However, the option to correct typology and reference conditions is not discussed. The RBMP assessment does not include the establishment of the indicator values for less stringent objectives.

In the case of Article 4(5) exemption for a surface water body due to chemical pollution (e.g. ES050MSPF011008047), the Guadalquivir RBMP states that industrial activities are responsible for the pollution, and it is not feasible to stop their activity, so less stringent objectives have to be adopted, due to "technical feasibility". The available information is displayed in table format at water body level, and references are provided for background documents and Appendixes, such as the one describing the results of the PATRICAL tool simulation.

The pressures responsible for exemptions in surface water come from a broad range of activities including urbanisation, industry, agriculture, mining, abstraction and activities leading to changes in hydromorphology.

For groundwater the main pressures responsible for exemptions are point and diffuse pollution from industry and agriculture. Abstraction is referred to in the Duero, Guadalquivir, Balearic Islands, Catalan and Melilla RBDs.

The main drivers for exemptions are urban development, tourism and recreation, industry, flood protection, fisheries and aquaculture, energy and agriculture.

Table 8.1 ***Pressure responsible for Priority Substances in Spain failing to achieve good chemical status in surface water and for which exemptions have been applied***

Significant pressure on surface water bodies	Number of failing Priority Substances	Number of Article 4(4) - Technical feasibility exemptions	Number of Article 4(5) - Technical feasibility exemptions
	Number	Number	Number
1.1 - Point - Urban waste water	21	185 (138)	3
1.2 - Point - Storm overflows	9	20 (19)	0
1.3 - Point - Industrial Emissions Directive plants	14	20 (16)	4
1.4 - Point - Non Industrial Emissions Directive plants	21	131 (99)	2
1.6 - Point - Waste disposal sites	4	6	0
1.7 - Point - Mine waters	2	3	0
1.9 - Point - Other	4	0	0
2.1 - Diffuse - Urban run-off	13	38 (35)	0
2.2 - Diffuse - Agricultural	18	139 (98)	1
2.4 - Diffuse - Transport	5	6	0
2.5 - Diffuse - Contaminated sites or abandoned industrial sites	6	9 (8)	0
2.6 - Diffuse - Discharges not connected to sewerage network	6	19	1
2.7 - Diffuse - Atmospheric deposition	2	7	0
2.8 - Diffuse - Mining	7	71 (70)	0
2.10 - Diffuse - Other	6	14 (13)	0
3.1 - Abstraction or flow diversion - Agriculture	4	8	0
3.2 - Abstraction or flow diversion - Public water supply	3	11	0
3.3 - Abstraction or flow diversion - Industry	4	11	0
3.4 - Abstraction or flow diversion - Cooling water	3	3	0
3.7 - Abstraction or flow diversion - Other	2	2	0
4.1.4 - Physical alteration of channel/bed/riparian area/shore - Other	3	3	0
4.2.1 - Dams, barriers and locks - Hydropower	1	1	0

Significant pressure on surface water bodies	Number of failing Priority Substances	Number of Article 4(4) - Technical feasibility exemptions	Number of Article 4(5) - Technical feasibility exemptions
	Number	Number	Number
4.2.2 - Dams, barriers and locks - Flood protection	4	8	0
4.2.7 - Dams, barriers and locks - Navigation	2	2	0
4.2.8 - Dams, barriers and locks - Other	2	3	0
4.3.1 - Hydrological alteration - Agriculture	1	1	0
4.3.3 - Hydrological alteration - Hydropower	3	3	0
4.3.4 - Hydrological alteration - Public water supply	1	1	0
4.3.6 - Hydrological alteration - Other	2	3	0
5.1 - Introduced species and diseases	4	10	0
7 - Anthropogenic pressure - Other	3	3	0
8 - Anthropogenic pressure - Unknown	7	20	0

Source: WISE electronic reporting. Spain subsequently informed that there were errors in the data, the corrected numbers are in brackets in this table.

Table 8.2 Pressure responsible for pollutants in Spain failing to achieve good chemical status in groundwater and for which exemptions have been applied

Significant pressure on groundwater	Number of failing pollutants	Number of exemptions				
		Article 4(4) - Technical feasibility	Article 4(4) - Disproportionate cost	Article 4(4) - Natural conditions	Article 4(5) – Technical feasibility	Article 4(5) - Disproportionate cost
1.1 - Point - Urban waste water	8	10		7		
1.2 - Point - Storm overflows	2	2				
1.3 - Point - Industrial Emissions Directive plants	2	1				1
1.4 - Point - Non Industrial Emissions Directive plants	8	22		2		1
1.5 - Point - Contaminated sites or abandoned industrial sites	7	4				8

Significant pressure on groundwater	Number of failing pollutants	Number of exemptions				
		Article 4(4) - Technical feasibility	Article 4(4) - Disproportionate cost	Article 4(4) - Natural conditions	Article 4(5) – Technical feasibility	Article 4(5) - Disproportionate cost
1.6 - Point - Waste disposal sites	5	16	3			
2.1 - Diffuse - Urban run-off	5	3				10
2.10 - Diffuse - Other	5	7				
2.2 - Diffuse - Agricultural	14	158 (106)	64 (45)	97 (93)	16	28 (21)
2.4 - Diffuse - Transport	2	2				
2.5 - Diffuse - Contaminated sites or abandoned industrial sites	1	1				
2.6 - Diffuse - Discharges not connected to sewerage network	1	1				
2.8 - Diffuse - Mining	5	1				5
3.1 - Abstraction or flow diversion - Agriculture	9	82	23 (21)	94 (93)		11
3.2 - Abstraction or flow diversion - Public water supply	8	33 (31)	32 (28)	54 (53)		4
3.3 - Abstraction or flow diversion - Industry	5	2	8			11 (9)
3.6 - Abstraction or flow diversion - Fish farms	1	1				
3.7 - Abstraction or flow diversion - Other	2	2		1		
7 - Anthropogenic pressure - Other	1	2	9	3		
8 - Anthropogenic pressure - Unknown	7	19	11	18		

Source: WISE electronic reporting. Values in brackets provided by Spain in the frame of the assessment.

Spain subsequently informed that there were errors in the data, the corrected numbers are in brackets in this table.

Application of Article 4(6)

In the Duero RBD, Article 4(6) is applied in the second RBMP because of accidents. In the Guadiana RBD, 17 water bodies are listed for temporary deterioration due to prolonged droughts.

Application of Article 4(7)

In the first RBMPs, most RBDs stated that there is the possibility of applying exemptions for new modifications, Article 4(7), and provided examples of conditions and examples of those modifications. However, none of these RBMPs or Programme of Measures included any case for which this exemption was finally applied to any water body. In the second RBMPs, Article 4(7) is applied in several basins (Western Cantabrian, Eastern Catabrian, Duero, Guadalquivir, Júcar, Segura, Tinto, Odiel and Piedras, Ebro, Ceuta and Melilla). In the first cycle, Andalusian Mediterranean Basins mentioned the intention of using this type of exemption and it is unclear why this is no longer the case in the second cycle. The RBMP Guadalquivir states that for two groundwater bodies exemptions under Article 4(7) have been included in the second cycle. Appendix 6 includes a list of six initiatives (mining, river dredging and dam construction) which lead to Article 4(7) exemptions; for each of them a fiche is included in the RBMP. For the Ebro RBMP, 22[61] surface water bodies were reported applying exemptions under Article 4(7).

There is evidence that the impact of the new modifications on the water status has been assessed in the RBMPs, as the corresponding RBMPs include fiches for each of the new modifications foreseen under Article 4(7). These fiches include tick-box information as well as overview maps, textual description and small tables. In the Guadalquivir RBMP, the impact of the new modification of the status of the affected water bodies has been assessed. However, in the case of the dam construction (Recrecimiento del Embalse del Agrio) the effects have only been assessed by the Spanish authorities for the four water bodies directly affected by "physical changes" (which is the terminology used for describing the change), and not for the downstream water bodies of the Guadiamar river, which might be affected by the water uses and abstractions. The corresponding fiche of the RBMP refers however to the need to study ecological flows downstream the dam, whilst no mention is made to the implementation of ecological flows, as studied or assessed.

[61] Spain subsequently clarified that this number should be 7.

In the Guadalquivir RBD, no assessment of possible cumulative effects has been carried out for the six new modifications. As mentioned already, downstream modifications of hydrological conditions seem to be only marginally considered.

In the Ebro RBMP, the impact of the new modifications on the status of the affected water bodies appears to be assessed by the Spanish authorities in a generic way. For example, regarding one dam construction (Embalse de Riomayor en río Ega), tick boxes of the fiche describe that deterioration of water bodies will occur, and additional textual information informs about the type of the change (e.g. from natural to artificial water body). The information regarding the expected trend or change in status classification is scarce, with one line per water body affected, and refers to uncertainties and the fact that the future status can only be defined after the construction of the dam and the start of the operations. No assessment of possible cumulative effects has been carried out for the new modifications in the RBD Ebro. The main type of cumulative effects of the new dams foreseen in the RBMP may include hydrological and hydromorphological changes downstream (for shorter or longer river stretches) and their effects on biological elements. In this sense, the fiches appear to reflect significant gaps, as the changes in downstream hydrology are perceived as "improvements of water availability in the river bed, with likely positive effects on fish population and invertebrates" according to the used indicators (e.g. in fiche "Embalse de Robres del Castillo en río Jubera"). The RBMP text might reflect misperceptions of the WFD objectives and/or inappropriate indicators to determine the biological status.

The fiches used for the justification of Article 4(7) exemptions include a section with a generic tick box to clarify if mitigation actions have been taken, including a reference to the corresponding Environmental Impact Assessment studies, as well as a text box for further justification. In the case of a dam construction (Recrecimiento del Embalse del Agrio) in Guadalquivir, the text refers to the site selection (e.g. already deteriorated due to pre-existing mining materials) and future considerations under the Environmental Impact Assessment. Regarding the planned river dredging in the river estuary (Measure Guadalquivir 0554), the Article 4(7) fiche includes a list of measures foreseen, such as mainly additional studies, environmental control measures, and a rehabilitation plan (included as Measure in the RBMP: Guadalquivir 0551). In the case of Ebro, a list of the mitigation actions is provided, with a tick box next to each to indicate whether the measure is already ongoing or planned, and the text refers also to the status of the corresponding Environmental Impact Assessment. However, the mitigation measures listed are not water-body specific, and they do not refer specifically to those quality elements which would be deteriorated by the new modification.

As regards to overriding public interest and/or that the benefits of the project outweigh the benefits of achieving the WFD environmental objectives, the RBMP Ebro shows that a balancing test of the benefits of the Project (Embalse de Riomayor en río Ega) has been undertaken, with a monetary quantification, which is however not supported by background documents or references. It refers to the additional incomes of farmers when changing current land-use to irrigation, and the possibility of creating irrigation-associated jobs, it also accounts for the direct employment for constructing the planned dam. However, the benefits from achieving the WFD objectives are not quantified in monetary terms (protected areas are affected by the dam construction and the new irrigation area) for the balancing test, and the section which lists the corresponding benefits also includes references to the benefits of the dam construction, such as increased water availability. In this sense, the balancing test does not seem to consider benefits and losses in a similar or comparable way. Spain clarified that the state of the art regarding the approach to ecosystem services is still limited. Another dam project (Embalse de Mularroya en río Grío) included in Ebro RBMP refers in its fiche to overriding public interest. Out of the four possible tick boxes to choose from, it refers to social and economic benefits, and provides a textual explanation. This text refers to the regulatory decisions since the 1998 river management plan to consider the dam as of overriding public interest, which has been incorporated in latter regulatory documents, including the first RBMP. Within its arguments, the text refers to the fact that the dam will enable supply of water for agriculture and other uses, groundwater recharge, flood protection and guarantee flow in the river. The RBMP text refers to additional studies, which e.g. model the future decline of water resources in the sub-basin due to climate change. Regarding the social and economic benefits, the text refers to expected investments in irrigation agriculture in the lower part of the sub-basin, with likely positive impacts in the secondary and tertiary economic sectors. References are made to studies. However, no specific figures on the expected economic benefits are included in the justification text. Secondary reasons related to improved drinking water supply and human health, as well as to flood risk mitigation are briefly mentioned within a phrase. Reference is also made to additional studies of the Environmental Impact Assessment, which explain how the character and status of water bodies might evolve in future.

In the Guadalquivir RBMP, overriding public interest for the Cerrada de la Puerta dam (Measure 0291) is argued on the basis of ‘public security’ and ‘other social and economic reasons’, for addressing ‘flood protection’ and ‘water deficit reduction’ in the basin. Though irrigation agriculture (for olive crops) has not been selected as beneficiary sector of the measure within the tick boxes, the textual description refers exclusively to such uses. No data nor information is included in the justification regarding flood risks or public security. The river dredging project for the Guadalquivir estuary is considered of overriding public interest

due to three different reasons, namely ‘human health’, ‘public security’ and ‘other social and economic arguments’. The textual description refers to the reduction of flood risks by higher discharge speed due to the dredged flow channel. However, no further data or references are included in the justification. Regarding economic aspects, a table is provided on the individual transport costs referred to different ship sizes. However, no further considerations or references are included in the justification. It might additionally be considered that the Guadalquivir Flood Risk Management Plan neither establishes an Area of Potentially Significant Flood Risk in the project area, nor includes the dredging in its Programme of Measures; which weakens the flood risk argument for justifying overriding public interest.

The San Calixto dam of Guadalquivir targets flood risks and public security; and the Agrio dam public security and environmental reasons, with irrigation agriculture and industrial water supply being benefitted. The Article 4(7) fiche includes the water supply in substitution of agricultural groundwater abstractions which currently affect the Doñana protected areas, thus the project aims indirectly to benefits in the protected area.

As regard to whether better environmental options have been taken into account, the exemption fiches included in the RBMPs specify the alternatives assessed with a tick-box exercise, and a short textual description. However, the information included in the RBMPs about the assessment of alternatives is rather limited and mainly focusing on different technical options for dam construction but not on alternatives addressing drivers behind the planned projects, although they may be considered by the RBD competent authorities at the stage of planning of the project. For example, in the Guadalquivir RBMP, the Agrio dam alternatives assessed are ‘non-action’ and dam capacity increase alternatives at the same site. Alternatives for addressing the underlying problem/cause with other means have not been analysed. The alternatives for the San Calixto dam assessed are three dam projects, with only varying altitude levels of the dam (154, 156 and 160 meters). The alternative to dredge the Guadalquivir estuary along 80 kilometres assesses three alternatives, including non-action and the construction of a new shipping canal. In this case, alternatives that have been proposed in public discussions such as the combined use of the major ports around Sevilla (e.g. Huelva, Cadiz and Algeciras) have not been included in the assessment. In the Ebro RBD, the Mularroya dam project justification refers to the Environmental Impact Assessment Declaration from 2015, and lists nine alternatives, including non-action and eight different dam alternatives, in different water bodies. The La Valcuerna project exemption fiche refers in tick-boxes to 19 alternatives, including non-action, 14 dam construction alternatives and four management alternatives (reduction of irrigated area, water trading schema, abandonment of salinised soils and combined use of alluvial groundwater), and adds a text paragraph which

refers to an alternative study carried out by the River Basin Authority in 2009 and other studies. The embalse de Albagés dam project includes in its exemption fiche three alternatives, including non-action and two dam options, with distance of one kilometre amongst both, different height and volume. The justification for the Robres del Castillo dam project is based on two alternatives (non-action, and dam), and includes a short paragraph in textual form without further references.

Application of Article 6(3) Groundwater Directive

According to WISE, exemptions under Article 6(3) Groundwater Directive have not been applied in any of the RBMPs. Spain subsequently clarified that it was considered that some of the reasons for applying this exemption may be covered by exemptions under Article 4 WFD.

8.2. Main changes in implementation and compliance since the first cycle

An important effort has been done since the previous plans, which has led to a significant decrease in the number of water bodies for which the environmental objective was not set (106 water bodies as compared to 335 in the first cycle).

The number of cases where Article 4(4) and 4(5) exemptions are applied has increased in a number of RBDs since the first RBMP. Spain subsequently clarified that this is a consequence of the efforts to prioritise the use of this exemption in order to limit the application of exemptions under Article 4(5) on setting less stringent objectives.

Exemptions under Article 4(6) were not applied in the first cycle, but have been applied because of an accident in the Duero RBD and in Guadiana for temporary deterioration in the second cycle. Most RBMPs stated in the first cycle that there is the possibility of applying exemptions for new modifications (Article 4(7)) and provided examples of conditions and examples of those modifications. However, these were finally not applied. In the second cycle, Article 4(7) is applied in some several RBDs. Spain subsequently informed that, following the recommendations from the Commission, a Technical Instruction was adopted at national level for the analysis of the the requirements of Article 4(7) for new modifications, and that in all RBMPs a detailed explanation on the exemptions applied is provided in the fact sheets specific per water body.

8.3. Progress with Commission recommendations

The Commission recommendations based on the first RBMPs and Programme of Measures requested action on the following:

- Recommendations: A) *The application of exemptions needs to be more transparent and the reasons for the exemptions should be clearly justified in the plans. B) Provide better justification of exemptions. There is no analysis of the measures needed to achieve good status. Therefore, it is not possible to justify whether measures are disproportionately costly or technically unfeasible. Measures need to be taken as far as possible in water bodies where exemptions are applied, and report them in the RBMPs.*

  Assessment: Some progress has been made regarding this recommendation, for example by increasing the transparency in the application of exemptions and providing the justifications for those exemptions, for whish specific exemption fiches have been developed, including the measures foreseen. However, further efforts are needed to better justify the reasons, including the reference to relevant studies or documents supporting the decision. Therefore, this recommendation has been partially fulfilled.

- Recommendation: *Ensure in the second RBMPs that the status of all water bodies is assessed in accordance with the WFD before considering any further infrastructure that would be liable to cause deterioration in the status of water bodies or prevent the achievement of good status. These infrastructures can only be authorised if the conditions of Article 4(7) are fulfilled. The justification needs to be included in the RBMP. The "declaration of general interest" in the Spanish legislation cannot be automatically equated with the concept of "overriding public interest" in article 4(7)(c). This has to be justified case by case in the second RBMPs*

  Assessment: The recommendation has been applied by Spain for some types of modifications, such as new dams or the estuary dredging of the Guadalquivir river. However, it has not been applied to other modifications, e.g. related to flood prevention or water abstractions. Thus, the recommendation has been partially fulfilled.

- Recommendation: *As regards new dams, Spain should justify the flood protection share on a case by case basis, including the justification that there is no better environmental option.*

Assessment: No change has been observed in the second RBMPs for many types of modifications. Nevertheless, Spain subsequently clarified that for dams intended for flood protection the river basin competent authorities carry out a *multifactorial analysis* on a case by case basis, which includes the consideration of other possible better environmental options. For the justification of all other new infrastructure, Spain informed that further efforts will be needed for the next cycle. Thus, the recommendation has been partially fulfilled.

- Recommendation: *Ensure in the second RBMPs that the status of all water bodies is assessed in accordance with the WFD before considering any further infrastructure that would be liable to cause deterioration in the status of water bodies or prevent the achievement of good status. These infrastructures can only be authorised if the conditions of article 4(7) are fulfilled. The justification needs to be included in the RBMP. The "declaration of general interest" in the Spanish legislation cannot be automatically equated with the concept of "overriding public interest" in article 4(7)(c). This has to be justified case by case in the second RBMPs.*

  Assessment: All the RBMPs include a detailed explanation in individual factsheets for each water body, where the justification for the use of Article 4(7) for new modifications is provided. There remain however some shortcomings, e.g. that the information included in the RBMPs about the project alternatives suggests that these are assessed mainly in terms of different technical options but not in a broader sense addressing the actual drivers behind; or that the benefits-losses balance-tests do not seem to address benefits and losses in a comparable way. Even if significant efforts have been made to improve these aspects in the second RBMPs, in line with the commitments undertaken in the action programmes included in the Association Agreement (EU-Spain 2014-2020), the generic approach to the application of exemptions under Article 4(7) needs to be further changed to specific criteria. The concept of 'overriding public interest' continues to be insufficiently addressed by the 'declaration of general interest' of the Spanish legislation. No change has been observed in the treatment of the concept of 'overriding public interest'. This recommendation has therefore been partly fulfilled.

- Recommendation: *Ensure that environmental objectives are established for all water bodies in the second cycle, including for HMWBs and AWBs. If no objectives are defined, appropriate measures cannot be established either.*

Assessment: Environmental objectives for ecological and chemical status of surface water have been reported in all RBDs as well as for chemical and quantitative status of groundwater. Information is also provided on when the objectives will be achieved, although for a number of water bodies the date for the achievement of the objectives is unknown. Ecological potential has been classified for heavily modified and artificial water bodies for all water categories. There is only a small share of river and lake heavily modified / artificial water bodies whose potential is unknown, but this share is slightly higher for coastal water bodies amounting to 14 %. Therefore, this recommendation can be considered as fulfilled.

Topic 9 Programme of measures

The aim of this chapter is to provide an overview of the Programme of Measures reported by Members; more specific information on measures relating to specific pressures (for example arising from agriculture) is provided in subsequent chapters.

> The Key Types of Measures (KTM) referred to in this section are groups of measures identified by Member States in the Programme of Measures, which target the same pressure or purpose. The individual measures included in the Programme of Measure (being part of the RBMP) are grouped into Key Types of Measures for the purpose of reporting. The same individual measure can be part of more than one Key Types of Measure because it may be multi-purpose, but also because the Key Types of Measures are not completely independent silos. Key Types of Measures have been introduced to simplify the reporting of measures and to reduce the very large number of Supplementary Measures reported by some Member States (WFD Reporting Guidance 2016).
>
> A Key Types of Measure may be one national measure but it would typically comprise more than one national measure. The 25 predefined Key Types of Measures are listed in the WFD Reporting Guidance 2016.
>
> The Key Types of Measures should be fully implemented and made operational within the RBMP planning period to address specific pressures or chemical substances and achieve the environmental objectives.

9.1 Assessment of implementation and compliance with WFD requirements in the second cycle

9.1.1 General issues

An indication as to whether or not measures have been fully implemented and made operational is when they have been reported as being planned to tackle significant pressures (at the Key Types of Measure level). Significant pressures are also reported at the water body level. It would therefore be expected that there would be measures planned in the RBMP to tackle all significant pressures. Significant pressures for which KTMs were operational, and

significant pressures causing failure of objectives, were reported for all 18 RBDs for which information was provided, both for groundwater and surface water. Coverage of significant pressures with operational KTMs is variable for different RBDs.

Spain subsequently clarified that due to the fact that the reporting guidance and the reporting system tools were available for the Member States after the completion of the RBMPs, the organization of measures does not reflect the reality. When the classification of KTM was established, Spain has already catalogued thousands of measures according to the described typologies in the Spanish Hydrological Planning Instruction. The assignment of KTM was made at the end of the process, translating each subtype (over 200) to a determined KTM. It was not possible to translate measures one by one, in an individual way, due to the large number of them.

For surface water, seven representative RBDs were selected for detailed checking of KTM and their links to pressures. Two of these RBDs had reported operational KTMs for all significant pressures causing failure (Guadiana and Andalusian Mediterranean Basins) and three reported most of the pressures covered by operational KTMs (Segura, Jucar, and Ebro). Two other RBDs had only a small proportion of pressures covered: the Guadalquivir RBD reported KTMs for six of 31 pressures, and the Balearic Islands RBD reported KTMs for six of 23 pressures. In both cases there is an absence of all pressures due to physical/hydrological/hydromorphological alterations, as well as introduced species or exploitation of animals/plants. The Guadalquivir RBD also did not address abstraction/flow diversion pressures. All seven of the RBDs checked included KTMs for physico-chemical parameters, individual chemical substances and priority pollutants, and two of them (Segura and Jucar) listed ‘Significant Other Pressures causing failure’, but none were reported to be addressed with KTMs.

For groundwater, three of the seven representative RBDs checked in detail had reported operational KTMs for all significant pressures causing failure (Andalusian Mediterranean Basins, Jucar, and Ebro), two of these (Andalusian Mediterranean Basins and Ebro) also included operational KTMs for some pressures not reported as causing failure of objectives. For three others (Guadiana, Segura, and Balearic Islands) about 60 % of reported pressures had reported operational KTMs, whilst one other (Guadalquivir) only had KTMs for three of the 15 reported pressures. All four RBDs reported KTMs for one or more additional pressures not causing failures. Pressures not covered included some point and diffuse sources, and abstraction/flow diversions.

The number of national or RBD specific measures incorporated into each key type of measure (KTM), including some national KTMs developed by Spain, are reported for all 18 RBDs for which information has been reported. However, many additional national KTMs have been mapped in each of the RBDs. Therefore, it is not clear if these are relevant or will be made operational. In total, 5365 national basic measures and 6051 national supplementary measures have been mapped against key types of measure, including 12 KTMs developed by Spain. 65 % of the national basic measures and 30 % of the national supplementary measures are mapped against KTM1 - Construction or upgrades of wastewater treatment plants, and 10 % of the national basic measures and 17 % of the basic supplementary measures are mapped against KTM14 - Research, improvement of knowledge base reducing uncertainty. At the other extreme, only 13 national basic measures (0.24 %) and three national supplementary measures (0.05 %) are mapped against KTM15 - Measures for the phasing-out of emissions, discharges and losses of Priority Hazardous Substances or for the reduction of emissions, discharges and losses of Priority Substances. Spain has reported the type of the national basic measures in place, and a wide range of types of measure are being applied. No basic measures have been reported relating to the Integrated Pollution Prevention Control Directive (96/61/EC) and the Industrial Emissions Directive (2010/75/EU), or to prohibit direct discharges of pollutants into groundwater as required by Article 11(3)(j).

The percentage of water bodies not expected to achieve good status or potential has been marked zero by 2027 for all significant pressures in eight RBDs (groundwater and surface water), some others are estimated at 0-10 %, mainly for surface waters, whilst for groundwater are estimated at 10-20 % (Duero and Catalan RBDs) and even 20-50 % (Catalan RBD or >50 % (Melilla). For example in the Melilla RBD, two of the >50 % failures of groundwater bodies by 2027 relate to diffuse sources (urban run-off and agriculture) which do not appear to be covered by KTMs. Similarly, in the Catalan RBD two of the 20-50 % failures of groundwater bodies by 2027 relate to nitrate and diffuse pollution from agriculture and these may be covered by KTM99-02 (other national measures to reduce diffuse sources of pollution).

KTM23 - Natural Water Retention Measures (NWRM) is not reported to be tackling significant pressures in any of the RBDs, although 39 national basic measures and four national supplementary measures have been mapped against it in 11 RBDs, and the information on coordination with the Floods Directive[62] indicates that NWRM have been included in the Programme of Measures of 18 RBDs.

[62] Directive 2007/60/EC on the assessment and management of flood risks entered into force on 26 November 2007 http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32007L0060

KTMs have been mapped against River Basin Specific Pollutants causing a failure of objectives in surface water in 11 of the 18 RBDs for which information has been reported in WISE (no information was available for the Galicia-Coast[63], Eastern Cantabrian, Western Cantabrian, Guadiana, Balaeric Islands, Ceuta, or Melilla RBDs). However, for some RBDs no information was provided on which River Basin Specific Pollutants are causing failure of objectives in surface water in order to identify whether the measures are sufficient to address this issue.

For groundwater, KTMs have been mapped, and the number of groundwater bodies where individual chemical pollutants are causing a failure of objectives were reported for all 11 of the 18 RBDs. No information was provided for Galicia-Coast[64], Eastern Cantabrian, Western Cantabrian, Guadiana, Balearic Islands, Ceuta and Mililla RBDs. "KTM99 - Other key type measure reported under Programme of Measures" was reported as addressing the individual substances causing groundwater bodies to fail to be of good status in all the RBDs that reported measures. All KTMs were reported as KTM99 - Other key type measure reported under Programme of Measures, and no "Significant Other Pressures" were listed, except other chemical parameters in surface water in the Catalan RBD and in groundwater Terbumeton-desethyl in Jucar, nitrate in Guadalquivir and ammonia in Catalan RBD.

Priority Substances failing objectives in surface water bodies, including the number of surface water bodies failing objectives, and KTMs mapped against these have been reported for 15 RBDs (there is no information for the Balearic Islands, the Ceuta RBD and the Melilla RBD). All Priority Substances causing a failure of good status are reported to be addressed by measures in four RBDs only (Miño-Sil, Tagus, Guadiana and Guadalete and Barbete). For all other RBDs a few Priority Substances are not covered by a KTM; these are mainly related to pesticides, several polycyclic aromatic hydrocarbons (PAHs) and a few other substances. All KTMs were reported as KTM99 - Other key type measure reported under Programme of Measures.

Spain reported quantitative indicators and gap values for 18 RBDs for significant pressures (including individual chemical/Priority Substances and physico-chemical parameters) in groundwater and surface water for 2015, 2021 and 2027. The gap indicator are presented mainly as surface area or length and number of water bodies affected by the relevant

[63] Spain reported that Galicia-Coast RBD competent authority is working on the identification of basin-specific contaminants. In addition, in the design of the Galicia-Coast RBMP PoM the failures objectives have been taken into account, and solutions are proposed in all water bodies with an observed impact.

[64] Spain reported, as previously mentioned, that solutions are proposed in all water bodies with an observed impact. This is the case of the only groundwater body in the RBD where the operational monitoring has been increased.

significant pressure. KTMs indicators are listed for most significant pressures including KTMs developed by Spain, together with measure indicators for 2015, 2021 and 2027. KTM indicators are mainly investment and number of measures required, or 'other indicator' (KTM099); in many cases the latter are not associated with any quantitative gap indicators and values, and many refer merely to 'dummy indicators'. Some RBDs reported null values (i.e. no gap analyses) for a considerable number of significant pressures, notably the Galicia-Coast[65] Eastern Cantabrian, Guadalquivir, Catalan RBD, Ceuta and Melilla. Many but not all of the reported gaps are expected to be closed (zero) by 2027, some by 2021.

Cost-effectiveness analysis is an appraisal technique that provides a ranking of alternative measures on the basis of their costs and effectiveness, where the most cost-effective has the highest ranking. In the first Programme of Measures, some cost-effectiveness analysis was carried out but the approach used varied, and it was not clear how the results of the cost-effectiveness analysis were used in the selection of measures. According to the data reported to WISE, a qualitative cost-effectiveness analysis was carried out in all 18 main RBDs for the second Programme of Measures. The RBMP and background documents for the Ebro RBD were examined in more detail. It was found that measures have been established on the basis of the objectives of the RBMP (environmental objectives of the WFD, water supply objectives), and the available budget. An effectiveness analysis was carried out for (only) eight measures (irrigation modernisation, integrated Delta protection, urban wastewater treatment, agro-environmental measures, water rights management, effluents authorisation, definition of ecological flows targeting future demands, and improvement of urban water supply), referring briefly to the type of status indicators which would benefit from such measures. No further justification for the selection of measures is included.

A critical factor in the success of the implementation of the Programme of Measures is the availability of funding to support the investments required. Investment costs were reported for 18 RBDs for the first cycle (covering years 2009-15) and second cycle (2015-21) separately for WFD Article 11(3)(a) requirements (measures required to implement Community legislation for the protection of water) and measures required by Articles 11(3)(b-l), 11(4) and 11(5) of the WFD (all other measures). For the first Programme of Measures (2009-2015) a total of €2998 million was invested in Article 11(3)(a) measures in the 18 RBDs for which information was reported, whilst a total of €6735 million was invested in all other measures (Articles 11(3)(b-l), 11(4) and 11(5).

[65] Spain reported that in the Galicia-Coast RBMP a gap analysis was carried out regarding the currents situation. Further efforts will be done in this RBD and in the other Spanish ones to improve this part of the RBMPs and in particular for the analysis of the joint effect of different pressures and the reduction of the gap.

All 18 RBDs reported capital investment requirements for Article 11(3)(a) measures in the second Programme of Measures (2015-2021), these range from €1.4 million in the Melilla RBD to €1440 million in the Tagus RBD. The total investment required for all 18 RBDs is €5311 million, a significant increase on the investment made during the first Programme of Measures. 11 RBDs reported annual operation and maintenance costs for Article 11(3)(a) measures ranging from €0.24 million per year in the Eastern Cantabrian RBD to €141 million in the Guadalquivir RBD. The total reported operation and maintenance costs for the 11 RBDs is €785 million.

All 18 RBDs also reported capital investment requirements for the measures required by WFD Articles 11(3)(b-l), 11(4), and 11(5). These range from €21 million in the Melilla RBD to €1236 million in the Ebro RBD. In total €8176 million capital investment will be required for the implementation of measures required by WFD Articles 11(3)(b-l), 11(4), and 11(5) in the 18 RBDs which reported, again a significant increase on the investment made in the first Programme of Measures. 11 RBDs reported annual operation and maintenance costs for these measures ranging from €1.51 million in the Ceuta RBD to €208 million in the Guadalquivir. The total annual operation and maintenance costs that will be required are €405 million. It should be noted that the Galicia-Coast RBD reported annual operation and maintenance costs for measures required by Article 11(3)(a) only, using the available information at that moment, whilst the Tinto, Odiel and Pedras RBD only reported annual maintenance and operation costs for measures required by Articles 11(3)(b-l), 11(4) and 11(5). Depreciation has not been included in any of the reported investment costs calculations.

Seven RBDs reported receiving European Union funds to finance measures in the first cycle (2009-2015). Funding received ranged from €4 million in the Eastern Cantabrian RBD to €329 million in the Galicia-Coast RBD. In total €953 million of European Union funding was reported. For the second Programme of Measures (2015-2021) six RBDs report that European Union funding is available to support the implementation of measures. This ranges from €24 million in the Andalusian Mediterranean Basins RBD to €178 million in the Duero RBD. In total, it is expected that a total of €579 million will be received from European Union funds to support the implementation of the second Programme of Measures, which is an increase from the first cycle. It should be noted that two RBDs (Eastern Cantabrian and Western Cantabrian) both received European Union funding to support the implementation of the first Programme of Measures, but did not report any European Union funding for the second Programme of Measures, whilst the Andalusian Mediterranean Basins did not receive any European Union funding for the first Programme of Measures.

A lack of finance was reported as an obstacle to the implementation of the first Programme of Measures and no clear financial commitments are reported to have been secured for the implementation of the second Programme of Measures in any of the 18 main RBDs for any sector. This gives cause for concern for the potential success of the second Programme of Measures, particularly as the investment costs required have significantly increased.

Spain reported coordination of the preparation of all RBMPs and programmes of measures with the Marine Strategy Framework Directive[66], but no joint consultation and no consideration of the need for additional or more stringent measures beyond those required by the WFD in order to contribute to the achievement of the relevant Marine Strategy Framework Directive objectives in coastal and marine environments. National measures/RBD specific measures that are relevant to the Marine Strategy Framework Directive and the relevant KTMs are listed for all 18 RBDs for which information has been reported.

The RBMPs and the Flood Risk Management Plans have not been integrated. However, for all 18 RBDs for which information is provided:

- joint consultation of RBMPs and Flood Risk Management Plans was carried out,
- the objectives and requirements of the Floods Directive were considered in the second RBMPs and Programme of Measures,
- win-win measures in terms of achieving the objectives of the WFD and Floods Directive, drought management and use of Natural Water Retention Measures (NWRM) have been included in the Programme of Measures,
- the design of new and existing structural measures, such as flood defences, storage dams and tidal barriers, has been adapted to take account of WFD Environmental Objectives in all RBDs, and WFD Article 9(4) has been applied to impoundments for flood protection and, as such, it would be an activity/use which should be subject to cost recovery under Article 9. However, no clear financial commitments have been secured for the implementation of Programme of Measures in the flood protection sector in any RBDs.

[66] Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive) http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32008L0056.

9.1.2 Measures related to other significant pressures

Other significant pressures have been reported for 14 of the 18 RBDs for which information was reported. These relate to anthropogenic pressures and introduced species or diseases. The indicator gaps for 2015, 2021 and 2027 are given as surface area or length, and number of water bodies affected by the relevant pressure. KTM 18 – 'Measures to prevent or control the adverse impacts of invasive alien species and introduced diseases' is reported as tackling introduced species or diseases, with indicators and gap values for 2015, 2021 and 2027 reported as investment and number of measures required. All anthropogenic pressures are addressed with KTM99 – 'Other key type measure reported under Programme of Measures' and no quantitative indicators are presented ('dummy indicators'- all zero). Many but not all of the gaps are expected to be closed (zero) by 2027, some by 2021.

9.1.3 Mapping of national measures to Key Types of Measure

It was expected that Member States would be able to report their Programme of Measures by associating their national measures with predefined KTM. KTM are expected to deliver the bulk of the improvements through reduction in pressures required to achieve WFD Environmental Objectives. A Key Type of Measure may be one national measure but it would typically comprise more than one national measure. Member States are required to report on the national measures associated with the KTMs, and whether the national measures are basic (Article 11(3)(a) or Article 11(3)(b-l)) or supplementary (Article 11(4)).

Table 9.1 summarises the number of national measures that have been mapped to the relevant KTMs in Spain. Also shown is the number of RBDs for which the Key Type of Measure has been reported. Table 9.2 then summarises the type of basic measures associated with the national measures mapped against the Key Type of Measure.

Table 9.1 Mapping of the types of national measures to Key Types of Measure in Spain

Key Type of Measure	National basic measures	National supplementary measures	Number of RBDs where reported
KTM1 - Construction or upgrades of wastewater treatment plants	3479	1826	18
KTM10 - Water pricing policy measures for the implementation of the recovery of cost of water services from industry	2		2
KTM11 - Water pricing policy measures for the implementation of the recovery of cost of water services from agriculture	6		4
KTM12 - Advisory services for agriculture	8	95	15
KTM13 - Drinking water protection measures (e.g. establishment of safeguard zones, buffer zones etc)	33	7	13
KTM14 - Research, improvement of knowledge base reducing uncertainty	558	1023	18
KTM15 - Measures for the phasing-out of emissions, discharges and losses of Priority Hazardous Substances or for the reduction of emissions, discharges and losses of Priority Substances	13	3	5
KTM16 - Upgrades or improvements of industrial wastewater treatment plants (including farms).	19	28	11
KTM17 - Measures to reduce sediment from soil erosion and surface run-off	6	191	18
KTM18 - Measures to prevent or control the adverse impacts of invasive alien species and introduced diseases	16	130	17
KTM2 - Reduce nutrient pollution from agriculture	148	38	16
KTM20 - Measures to prevent or control the adverse impacts of fishing and other exploitation/removal of animal and plants	25	65	13
KTM21 - Measures to prevent or control the input of pollution from urban areas, transport and built infrastructure	117	39	13
KTM23 - Natural water retention measures	4	39	11
KTM3 - Reduce pesticides pollution from agriculture.	18	11	8
KTM4 - Remediation of contaminated sites (historical pollution including sediments, groundwater, soil)	12	25	9
KTM5 - Improving longitudinal continuity (e.g. establishing fish passes, demolishing old dams)	45	220	15
KTM6 - Improving hydromorphological conditions of water bodies other than longitudinal continuity	57	671	17
KTM7 - Improvements in flow regime and/or establishment of ecological flows	103	55	16
KTM8 - Water efficiency, technical measures for irrigation, industry, energy and households	246	445	18
KTM9 - Water pricing policy measures for the implementation of the recovery of cost of water services from households	12		5
KTM99-01 - Other national measures to reduce point sources of pollution	23	97	17
KTM99-02 - Other national measures to reduce diffuse sources of pollution	38	80	16
KTM99-03 - Other national measures to reduce pressure caused by water abstractions	21		9

KTM99-04 - Other national measures to improve morphological conditions of water bodies	11	67	10
KTM99-06 - Other national measures to preserve and improve the structure and functions of aquatic ecosystems	30	83	13
KTM99-07 - Other national measures linked to impacts	41	116	15
KTM99-08 - Other national measures linked to drivers	6	13	9
KTM99-11 - Other national measures (not directly linked to pressures or impacts): Governance	132	153	18
KTM99-12 - Other national win-win measures to increase available resources	62	151	15
KTM99-13 - Other national win-win measures to flood prevention	74	330	18
KTM99-15 - Other national win-win measures to flood preparation		13	7
KTM99-19 - Other national win-win measures to satisfy other water uses		37	7
Total number of Mapped Measures	**5365**	**6051**	**18**

Source: Member States reporting to WISE

Table 9.2 Type of basic measure mapped to Key Type of Measures in Spain

Key Type of Measure	Basic Measure Type													
	Accidental pollution	Controls water abstraction	Cost recovery water services	Efficient water use	Hydromorphology	IPPC IED	Nitrates	Point source discharges	Pollutants diffuse	Pollutants direct groundwater	Protection water abstraction	Recharge augmentation groundwaters	Surface Priority Substances	Urban Waste Water
KTM1 - Construction or upgrades of wastewater treatment plants	10			1		2	1	96	1		1		1	3366
KTM10 - Water pricing policy measures for the implementation of the recovery of cost of water services from industry			2											
KTM11 - Water pricing policy measures for the implementation of the recovery of cost of water services from agriculture			6											
KTM12 - Advisory services for agriculture				3					5					
KTM13 - Drinking water protection measures (e.g. establishment of safeguard zones, buffer zones etc)		1		1							31			
KTM14 - Research, improvement of knowledge base reducing uncertainty	9	109	3	100	134	1	1	214	59	1			5	2
KTM15 - Measures for the phasing-out of emissions, discharges and losses of Priority Hazardous Substances or for the reduction of emissions, discharges and losses of Priority Substances							3	5					5	
KTM16 - Upgrades or improvements of industrial wastewater treatment plants (including farms).			1			10		5	1					2
KTM17 - Measures to reduce sediment from soil erosion and surface run-off	2				1			2	1					
KTM18 - Measures to prevent or control the adverse impacts of invasive alien species and introduced diseases					16			11	11					
KTM2 - Reduce nutrient pollution from agriculture							144	1	2					1
KTM20 - Measures to prevent or control the adverse impacts of fishing and other exploitation/removal of animal and plants					25			25	25					
KTM21 - Measures to prevent or control the input of pollution from urban areas, transport and built infrastructure						111		2	2				1	1
KTM23 - Natural water retention measures								4						

Key Type of Measure	Basic Measure Type													
	Accidental pollution	Controls water abstraction	Cost recovery water services	Efficient water use	Hydromorphology	IPPC IED	Nitrates	Point source discharges	Pollutants diffuse	Pollutants direct groundwater	Protection water abstraction	Recharge augmentation groundwaters	Surface Priority Substances	Urban Waste Water
KTM3 - Reduce pesticides pollution from agriculture.									18					
KTM4 - Remediation of contaminated sites (historical pollution including sediments, groundwater, soil)								9	1				2	
KTM5 - Improving longitudinal continuity (e.g. establishing fish passes, demolishing old dams)					45									
KTM6 - Improving hydromorphological conditions of water bodies other than longitudinal continuity					57									
KTM7 - Improvements in flow regime and/or establishment of ecological flows		4		2	97									
KTM8 - Water efficiency, technical measures for irrigation, industry, energy and households		26		220										
KTM9 - Water pricing policy measures for the implementation of the recovery of cost of water services from households			9	3										
KTM99 - Other key type measure reported under PoM	11	37	23	100	156		1	176	150		6	2	1	15

Source: Member States reporting to WISE

Key

'Accidental pollution' = Article 11(3)(l): Any measures required to prevent significant losses of pollutants from technical installations and to prevent and/or reduce the impact of accidental pollution incidents.
'Controls water abstraction' = Article 11(3)(e): Controls over the abstraction of fresh surface water and groundwater and impoundment of fresh surface waters including a register or registers of water abstractions and a requirement for prior authorisation of abstraction and impoundment.
'Cost recovery water services' = Article 11(3)(b): Measures for the recovery of cost of water services (Article 9).
'Efficient water use' = Article 11(3)(c): Measures to promote efficient and sustainable water use.
'Hydromorphology' = Article 11(3)(i): Measures to control any other significant adverse impact on the status of water, and in particular hydromorphological impacts.
'IPPC IED' = Integrated Pollution Prevention Control Directive (96/61/EC) and the Industrial Emissions Directive (2010/75/EU) .
'Nitrates' = Nitrates Directive (91/676/EEC) .
'Point source discharges' = Article 11(3)(g): Requirement for prior regulation of point source discharges liable to cause pollution.
'Pollutants diffuse' = Article 11(3)(h): Measures to prevent or control the input of pollutants from diffuse sources liable to cause pollution.
'Pollutants direct groundwater' = Article 11(3)(j): Prohibition of direct discharge of pollutants into groundwater.
'Protection water abstraction' = Article 11(3)(d): Measures for the protection of water abstracted for drinking water (Article 7) including those to reduce the level of purification required for the production of drinking water.
'Recharge augmentation groundwaters' = Article 11(3)(f): Controls, including a requirement for prior authorisation of artificial recharge or augmentation of groundwater bodies.
'Surface Priority Substances' = Article 11(3)(k): Measures to eliminate pollution of surface waters by Priority Substances and to reduce pollution from other substances that would otherwise prevent the achievement of the objectives laid down in Article 4.
'Urban Waste Water' = Urban Waste Water Treatment Directive (91/271/EEC) .

9.1.4 Pressures for which gaps need to be filled to achieve WFD objectives and the Key Types of Measures planned to achieve objectives

Member States are required to report the gaps that need to be filled to achieve WFD Environmental Objectives in terms of all significant pressures on surface water and groundwater, in terms of Priority Substances causing failure of good chemical status and in terms of River Basin Specific Pollutants causing failure of good ecological status/potential. Member States were asked to report predefined indicators of the gaps to be filled or other indicators where relevant. Values for the gap indicators were required for 2015 and 2021, and were optional for 2027.

The information reported in WISE on the gaps to fulfil to achieve good ecological status include detailed data on the significant pressures on surface and groundwaters that may cause failure on the environmental objectives. For chemical status, the Member States reported the specific chemical substances causing failure.

This information is reported at the sub-unit level. Sub-units are smaller geographic areas within particular RBDs identified by Member States. Not all Member States have defined and reported sub-units.

Member States were required to report which KTMs are to be made operational to reduce the gaps to levels compatible with the achievement of WFD environmental objectives. A number of indicators were predefined for each KTM. Values of the indicators for the second and subsequent planning cycles were also to be reported to give an indication of the expected progress and achievements: the values for 2027 could be optionally reported. This means that the value of the indicator will be reduced with time as measures are implemented. A value of zero is comparable with 100 % good ecological status or potential or good chemical status.

This information was reported at sub-unit level, or at RBDs level if sub-units have not been reported by the Member State.

9.2 Main changes in implementation and compliance since the first cycle

The level of implementation of the first cycle of Programme of Measures in all 18 RBDs for which information was provided was reported as ‘some measures completed’, although Spain chose not to provide a brief description for any of the RBDs. Obstacles were reported for all

RBDs in terms of delays, governance, lack of finance and lack of mechanisms. No obstacles were reported in terms of extreme events, lack of measures or cost effectiveness. Links to documents were provided for six of the 18 RBDs. The RBMP and background documents for the Ebro RBD were further examined in the assessment and it was found that the summary of changes mainly refers to numerical figures of measures executed or not.

Significant progress seems to have been achieved on the issues included in recommendations from the assessment of the first RBMPs by the listing of:

- significant pressures for each of the 18 RBDs,
- number of water bodies failing objectives due to specific pressures,
- Key Type of Measures to tackle these pressures, and
- mapping of national measures.

In addition, gap analyses for 2015, 2021 and 2027 have been reported for most significant pressures in 18 RBDs and including investment costs required for some measures.

New legislation or regulations to implement the Programme of Measures in the first cycle was reported necessary and already implemented in all of the 18 RBDs for which information was provided.

9.3 Progress with Commission recommendations

- Recommendation: *Separate very clearly in the second RBMPs the measures designed to achieve the environmental objectives from others. The latter need to be treated as Article 4(7) exemptions whenever appropriate (i.e. modifications to water bodies liable to cause deterioration or prevent the achievement of good status or potential).*

  Assessment: No information was found to answer the issues addressed in this recommendation in the assessment of data reported to WISE. In the assessment of RBMPs and background documents the RBMP for the Ebro RBD was examined in more detail and it was found that this plan differentiates between four groups of measures, with one of them (40.8 % of the RBMPs investment) targeting the WFD environmental objectives, and others targeted to water supply, floods and droughts and governance. A number of major water infrastructure projects for water supply such as

dams have been considered as Article 4(7) exemptions and some justification provided accordingly. However, this might not be the case for all other infrastructure projects as flood dykes or similar. In summary, not enough information on progress regarding this recommendation could be found in the plans[67]. Therefore, this recommendation has been partially fulfilled.

- Recommendation: *Ensure that there is a proper integration of the pressures and impacts analysis, the status assessment and the design of the PoMs. Avoid defining the PoMs on the basis of business as usual and a non-transparent assessment of "what can be done", but rather on a genuine gap analysis that identifies which measures are needed to achieve good status and can also support the justification of exemptions.*

  Assessment: Gap analyses have been reported for most significant pressures for 2015, 2021 and 2027 in all of the 18 RBDs for which information was reported. The investment costs required for some measures were also reported. It appears that cost-effectiveness analysis has been used to support decision making in the selection of measures for a few Key Types of Measure. In the assessment of RBMPs and background documents the RBMP for the Ebro RBD was examined in more detail and it was found that the RBMP includes an overview table and fiches describing the quality-element specific gaps to achieve good status. However, there is no apportionment of the gap to sectors or a detailed explanation of the selection of measures. The fiche usually provides brief texts which state that 'measure A will contribute to achieving good status by 2021/2027', without further description of effectiveness assessment or modelling tools used. Therefore, this recommendation has been partially fulfilled.

- Recommendation: *Ensure that RBMPs provide much more information about the measures, such as their location (including the number of water bodies), classification (basic, other basic, supplementary) and character (voluntary or binding), the targeted sector and source, the pressure they address (beyond the current grouping by general topics) and the expected specific effects in terms of status improvement.*

  Assessment: This has been addressed to some extent by the listing of significant pressures for each of the 18 RBDs, number of water bodies failing objectives due to specific pressures, Key Type of Measures to tackle these pressures, mapping of national

[67] Spain subsequently clarified that has clearly differentiated the measures in 19 types and 206 subtypes. The 19 types allow to clearly distinguish those measures which are aimed to the achievement of the environmental objectives from the rest.

measures, and the gap analyses for 2015, 2021 and 2027. However, the assessment of data reported to WISE could not address the level of detail required in this recommendation, especially details for specific water bodies. In the assessment of RBMPs and background documents the Ebro RBMP was examined in more detail, and it was found that the RBMP includes information about the name of the measure, the planning cycle in which it will be implemented, the budget and the financing level (European Union, National, Regional, Municipal, Individual). However, it does not provide details on the location (including the number of water bodies), classification (basic, other basic, supplementary) and character (voluntary or binding), the targeted sector and source, the pressure addressed and the expected specific effects in terms of status improvement (in the specific water bodies). Therefore, this recommendation has been partially fulfilled.

- Recommendation: *Ensure that the process of selecting (or not) measures is more sound and transparent, providing in the RBMPs not only statements that a cost-effectiveness analysis has been carried out, but also informing on the measures that have been considered in the analysis, its results and how this assessment has influenced the selection of measures.*

  Assessment: This recommendation has been addressed in part by the gap analyses for the 18 RBDs for which information was reported, but the assessment of data reported to WISE cannot address the level of detail required by this recommendation, such as unsuccessful measures and modelling/methodology/decision-support tools. In the assessment of RBMPs and background documents the Ebro RBMP was examined in more detail and it was found that it refers to the measures which have been discarded (1001) in the first planning cycle or added (11) to it, but there is no explanation of such changes. A list of potential measures for the first cycle is included (which includes all measures listed), but it is also unclear how the RBMP will deal with this set of measures. The RBMP chapter on the effectiveness of the measures during the first cycle lists the types of measures implemented (e.g. irrigation modernisation, wastewater treatment plants), the amount spent and includes 1-2 phrases on the possible effects on the status of water bodies. However, no quantitative assessment is provided. The cost-effectiveness assessment is a brief table which compares the overall investment amount per planning cycle with the number of water bodies in good status, calculating a ratio. No measure-specific analysis is included, or lessons learned from the first cycle are included in the RBMP. Therefore this recommendation has been partially fulfilled.

- Recommendation: *Clarify in the RBMPs what technical measures are behind legislation and how much they contribute to closing the gap to good status as basic measures are mostly presented as legislative acts (e.g. articles of the Water Law and related regulations).*

  Assessment: This has been addressed to some extent by the listing of significant pressures for each of the 18 RBDs for which information was reported, operational Key Type of Measures to tackle these pressures, numbers of water bodies failing to achieve good status, and the gap analyses for 2015, 2021 and 2027 (see also the recommendations addressed above). The Ebro RBMP was examined in more detail, and it was found that it does not clarify what actions are taken in practice (including e.g. technical measures) to implement the basic measures. Therefore, this recommendation has been partially fulfilled.

- Recommendation: *Ensure all water bodies are delimited, in particular in the Canary Islands, where so far no river, lake or transitional water bodies have been identified.*

  Assessment: With the exception of information on the administrative responsibilities, no information was reported for the 7 RBDs of the Canary Islands by the time this assessment was carried out. Therefore, this recommendation has not been fulfilled.

Topic 10 Measures related to abstractions and water scarcity

10.1 Assessment of implementation and compliance with WFD requirements in the second cycle

10.1.1 Water exploitation and trends

Water abstraction and exploitation continues to be very significant for a large part of Spain. According to the WISE-reported data, the RBDs with the highest WEI+ are Balearic Islands (97 %), Segura (77 %), Jucar (50 %) and Guadalquivir (45 %), all of them beyond the risk threshold of 40 %. Another important set of RBDs show values between 20-40 %, namely Guadiana, Guadalete and Barbate, Ebro (39.94 %, very close to the 40 % risk threshold, in particular given the uncertainties about water abstraction and consumption), as well as Catalan RBD and Ceuta; these being areas with significant abstraction pressures.

In two of the assessed RBDs (Guadiana and Balearic Islands), water consumption pressures have decreased in the recent past, and in two other (Guadalquivir, Ebro) no such summary statement can be made, based on the information available in the RBMP.

Spanish RBMPs include a water resource allocation and management plan.

10.1.2 Main uses for water consumption

In most of the Spanish RBDs, the main water consumer is agriculture (irrigation), for both surface and groundwater. It should be noted however, that most of the data, and in particular for irrigation, rely on surveys and modelling, and are often not backed by metering. In Guadiana, water demands have been estimated with real data available on abstractions and consumption in the most significant demand units of the RBD; whilst for the Balearic Islands, estimations are based on water allocation and water use authorisations. The water consumption of energy production is not always specified in the Spanish RBMPs[68].

[68] Spain subsequently clarified that refrigeration and evaporation consumptions are considered. However, no evidence could be found in the assessed RBMPs. In addition, Spain clarified that water consumption for energy production purposes is described for instance in the Guadalquivir and Ebro RBMPs.

10.1.3 Measures related to abstractions and water scarcity[69]

According to the WISE reported data, basic measures such as abstraction control under Article 11(3)(e) are in place in all RBDs. However, the intensity of the abstraction control might be insufficient as Spain reports (in 2017 and for previous years) that approximately 8 % of the agricultural holdings inspected under the Common Agricultural Policy cross compliance standards concerning the good agricultural and ecological conditions are infringing the requirement for legal water abstractions. Small abstractions do not require permitting procedures but have to be registered.

According to Spanish Water Law, River Basin Authorities must maintain a Water Register of concessions to control abstractions. The Water Register is organised into three sections:

- Section A: surface or groundwater concessions, reserves legally set aside for river basin authorities, special authorisations referred to in Article 59(5) of the Revised Water Act, and rights deriving from the previous Public Water Use Register.

- Section B: water usage from rainwater, wells and springs when the total annual volume does not exceed 7000 m^3 within the same piece of land.

- Section C: temporary use of private waters referred to in the temporary provision of the Revised Water Act.

River Basin authorities also maintain a Private Water Catalogue, which consists of an inventory of water abstractions classified as private by the Water Law of 1879, whose owners have chosen to keep them in such regime and not to include them in the Water Register.

The information on a systematic review of the concessions according to the WFD objectives could not be found in the RBMPs assessed.[70] The following measures regarding a concession

[69] Spain subsequently clarified that Spanish RBMPs include the allocation and reservation of water resources so as to meet the water needs for current and future uses, establishing water distributions within each river basin district. This information is critical not only for dealing with the socio-economic aspects, but also for assessing the impact produced by them, for calculating accurately environmental objectives in water bodies and, as the case might be, for rationalising the application of exemptions to the compliance of such objectives. The allocation and reservation of resources available for the foreseeable demands has been carried out based on the results of the balance obtained for the demands scenario established for the year 2021. Likewise, RBMPs have listed those demands which cannot be met with the available resources within the corresponding river basin districts. The allocation and reservation of resources is considered a key measure by Spain to address water scarcity and to manage abstractions.

[70] Spain subsequently clarified that this review is a routinary work of every River Basin Authority and many measures addressing this issue have been planned.

review have been included in the Programmes of Measures of some RBMPs (selection of plans assessed in more detail on this aspect):

- Guadiana includes the analysis of water rights with two types of measures: a study and monitoring of concessions for an adjustment to real consumption, and a study and monitoring of groundwater bodies at risk of failing to meet their environmental objectives for an adjustment of abstractions to available water resources.

- Guadalquivir includes, associated to modernisation of irrigation systems, a review of concessions to adjust water rights to new reduced consumption, following the commitments from the Rural Development Plans as by Article 46 of the Rural Development Regulation[71].

- Ebro: No information could be found in the RBMP.

- Balearic Islands includes three types of measures related to abstraction control: a) Updating of the Water Register and regularisation of concessions (review of data of all abstractions, completion of Water Register and Private Water Catalogue, and inventory of undeclared abstractions); b) Establishment of rules for abstractions and granting of concessions on groundwater bodies (proposal of modification or adaptation of rules for granting concessions, substitutions and guidelines for the exploitation and management of water bodies); c) Review of concessions on groundwater bodies according to water balances to ensure the achievement of the WFD objectives. In addition, Balearic Islands established in its Regulatory Document that no concessions will be granted in groundwater bodies in bad quantitative status.

Under Article 11(3)(c), measures promoting efficient and sustainable water use (e.g. water metering and allocations) were implemented in the previous cycle and no new measures nor significant changes are planned in any of the RBDs.[72]

No plan to extend and generalise the use of flow meters for all water abstractions and uses (especially agriculture) and to require users to report regularly the volumes actually abstracted to the River Basin Authorities has been found in the RBMPs assessed in more detail on this

[71] Regulation (EU) No 1305/2013 of the European Parliament and of the Council of 17 December 2013 on support for rural development by the European Agricultural Fund for Rural Development (EAFRD) and repealing Council Regulation (EC) No 1698/2005.

[72] Spain subsequently clarified that water allocations were updated in the second cycle RMBPs and published as regulation in the State Official Gazette.

aspect (Guadiana, Guadalquivir, Ebro, Balearic Islands).[73] The following measures regarding metering have been included in the Programmes of Measures in some RBMPs:

- Guadiana. The Programme of Measures includes a €120 million investment for the installation of metering devices.

- Guadalquivir. The Programme of Measures indicates that, according to water regulations, in all water abstractions the owner is obliged to install and maintain a metering device.

- Ebro: No information has been found.

- Balearic Islands. The Programme of Measures includes the installation of about 150 metering devices in order to control the most significant water abstractions, mainly for irrigation.

As to the process of compulsorily including abstractions in the Water Register, no information could be found, although Spain subsequently indicated that 10 RBDs have reported related measures.

Regarding measures under Article 11(3)(f), i.e. controls, including a requirement for prior authorisation of artificial recharge or augmentation of groundwater bodies, these were implemented in the previous cycle, and no new measures nor significant changes are planned in any of the RBDs.

Water pricing measures for water services from agriculture (KTM11) are only considered for abstraction pressures in a few RBDs (Guadalquivir, Guadalete and Barbate, Jucar), mainly focused on studies. Water pricing measures for water services from households (KTM9) are considered for abstraction pressures in three RBDs (Western Cantabrian, Guadalquivir, Jucar). In the majority of RBDs, the measure applied to tackle abstraction pressures is KTM8 on water efficiency and KTM99-other KTM reported under the Programmes of Measures. Water reuse is foreseen as a measure in most of the RBDs (except Galicia-Coast[74], Duero and Guadiana).

[73] Spain subsequently indicated that 9 of the 18 reported RBMPs include metering measures (Eastern Cantabrian, Western Cantabrian, Duero, Tagus, Guadiana, Guadalquivir, Guadalete and Barbate and Tinto, Odiel and Piedras and Balearic Islands).

[74] Spain subsequently clarified that in the Galicia-Coast RBD the first water reuse authorisations are being granted, and the data will be incorporated into the program of measures.

In most of the RBDs, water abstraction constitutes a major pressure on the status of water bodies, and hinders them from achieving good status. The measures taken are not sufficiently clear to identify if they fully address these pressures. In particular, only the RBDs Western Cantabrian, Eastern Cantabrian, Guadalquivir, Guadalete and Barbate, Tinto, Odiel and Piedras and Jucar include measures under KTM 11 and KTM9 (water pricing), which might indicate an insufficient implementation of Article 9 of the WFD.

10.2 Main changes in implementation and compliance since the first cycle

Overall, no major changes have occurred. Water abstractions and scarcity continue being extremely relevant for the majority of the RBDs (except Miño-Sil, Galicia-Coast, Eastern Cantabrian and Western Cantabrian RBDs), and Spain continues addressing this issue by investing in more efficiency (KTM8).

10.3 Progress with Commission recommendations

- Recommendation: '*Spain should consider the review of the legislation to incorporate explicitly the identification of water bodies at risk as a result of the pressures and impacts analysis.'*

  Assessment: No change can be detected in this assessment. Therefore, it is considered that this recommendation has not been fulfilled[75].

- Recommendation: '*Develop a plan to extend and generalise the use of flow meters for all water abstractions and uses - in particular, agriculture -, and to require users to report regularly to the river basin authorities the volumes actually abstracted. This information should be used to improve quantitative management and planning.'*

  Assessment: No plan to extend and generalise the use of flow meters for all water abstractions and uses (especially agriculture) and to require users to report regularly to the River Basin Authorities the volumes actually abstracted has been found in the RBMPs assessed but as subsequently indicated by Spain, measures aiming to increase the number of flow meters have been reported. These include some information which does not clarify if the approach by the Spanish authorities is to generalise the use of

[75] Spain subsequently clarified, that is preparing a systematic work to update the required report of the WFD Article 5 (to be published in 2018), which addresses this issue. Moreover, and linked to the compliance with Article 46 of the EAFRD Regulation, it is possible to take as reference the information on water bodies status reported in the RBMPs.

flow meters and by when such generalisation would be achieved. For some RBMPs, there is a clear indication that such generalisation will not be achieved in the next decade (e.g. Balearic Islands referring to the installation of 150 flow meters until 2027 with a public investment of 600,000 EUR, to cover 3-5 % of the agricultural area), whilst for others (Guadiana, Guadalquivir) the investment is private, but it remains unclear if the measure is being implemented and which control and sanction actions are foreseen in case of non-compliance. Finally, the Ebro RBMP does not refer to such metering. In summary, it is concluded that this recommendation has been partially fulfilled, with a major challenge to assure its full implementation.

- Recommendation: '*Ensure that all abstractions are registered and permits adapted to the available resources'.* '*Ensure that: the necessary amendments to the legislation are enacted to require all abstractions to be registered and regulated, no matter under which regime they got their permit (pre- or post-1985 Law)'.*

  Assessment: This recommendation is not considered as fulfilled, as on-going measures are yet to be assessed. As to whether the process of including abstractions in the Water Register is compulsory or not, no information could be found in the RBMPs and no corresponding regulatory changes were identified. No indication has been found that the RBMPs have made a concession review to ensure that they are aligned to the WFD objectives. In addition, the Spanish licensing system usually allocates water for long periods (a maximum of 75 years is established, although it is not systematically applied).[76]

- Recommendation: '*Ensure that: all abstractions are metered and subject to control of the river basin authorities'.*

  Assessment: According to Spanish Water Law, and as previously mentioned, the inclusion of abstractions in the Water register remains voluntary for a proportion of the water rights; namely the Private Water Catalogue, which consists of an inventory of water abstractions classified as private by the Water Law of 1879, whose owners have chosen to keep them in such regime and not to include them in the Water Register. However, Spanish authorities promote the conversion of private rights (which are considered temporary) into public concessions, considering limitations if good status is

[76] Spain subsequently clarified that it is compulsory to register all the water abstractions, either in the Water Register or in the Private Water Catalogue and that several measures related to the concession review to ensure that they are aligned to the WFD objectives have been reported. The results of these measures are yet to be assessed.

at risk (Real Decreto 670/2013, Art. 139bis, 196bis). In addition, Spain subsequently indicated that several measures have been reported to better meter abstractions, which results are yet to be assessed. Thus, this recommendation is considered partially fulfilled.[77]

- Recommendation: '*The way the modernisation of irrigation is considered in the Programmes of Measures needs to be reviewed. Only those projects which genuinely contribute to the WFD objectives should be labelled as such. Such contribution should be justified and quantified in the RBMPs on a case by case basis. The concession/permits should be reviewed and set to meet environmental objectives and then modernisation should be the efficiency measure put in place to achieve compliance with the new permit condition.'*

  Assessment: The implementation of this recommendation has not yet been assessed as not enough information on progress could be found in the Plans.

- Recommendation: *Spain should introduce abstraction volumetric fees for all users covering also properly calculated environmental and resource costs. Ensure that the cost-recovery instruments are adapted as soon as possible to the WFD to ensure that they provide adequate incentives to use the water efficiently. In addition, the revenues of cost-recovery instruments should be sufficient for the river basin authorities to effectively execute their water management tasks (update and maintenance of register of abstractions, monitoring, etc.).*

  Assessment: The assessment on this recommendation is included in chapter 14 of this report.

[77] Spain subsequently clarified that in addition to the fact that all water abstractions need to be compulsory registered (Water Register or the Private Water Catalogue), those included in the Private Water Catalogue represent only a small proportion in comparison to those included in the Water Register. All the abstractions included in the Water Register declare the volume or flow authorised. Spain has reported several measures addressed to increase the number of metered abstractions.

Topic 11 Measures related to pollution from agriculture

11.1 Assessment of implementation and compliance with WFD requirements in the second cycle

The main pressures from agriculture are: diffuse pollution (nutrients and chemicals), hydromorphological changes and abstractions in surface water and groundwater. For details on pressures, refer to Figure 2.2 in chapter 2. A gap assessment has been partly performed and for all basins the number of measures or the investment to achieve the objectives is provided.

The link between pressures and measures related to pollution from agriculture is fully established, but for abstractions related to agriculture this link is missing[78]. In the first cycle, KTMs applied in many RBMPs included increased efficiency of water usage in agriculture, by improving or changing supply infrastructure (e.g. Segura, Jucar, Balearic Islands), and the RBMPs usually referred to gross water savings that are transferred to the water balances. Irrigation efficiency measures or similar measures with the same rationale continue being applied in the second cycle Programme of Measures. The same applies to water reuse. Measures against erosion have been largely lacking in the first cycle but have been introduced in many basins in the second cycle.

No specific scope was given for the measures related to agricultural pollution in the first cycle. In the second cycle, the area of agricultural land to be covered by measures to achieve environmental objectives is provided for several measures. The measures applied in most RBDs are KTM12 - Advisory services for agriculture, KTM13 - Drinking water protection measures (e.g. establishment of safeguard zones, buffer zones), KTM17 - Measures to reduce sediment from soil erosion and surface run-off, KTM2 - Reduce nutrient pollution from agriculture and KTM23 - Natural water retention measures. KTM3 - Reduce pesticides pollution from agriculture is applied to a lesser extent. In all basins a combination of basic (the minimum requirement to be complied with) and supplementary measures can be found. Details on the application of KTMs are given in chapter 9 of this report.

It remains unclear if measures reported are voluntary or mandatory as the information from the RBMPs is not clear and not related to the KTMs. The WISE references to the Programme of Measures types are not always correct.

[78] Spain subsequently informed that there is a mistake in the reporting. Measures have been taken to limit the effects of abstractions (e.g. implementation of ecological flow regimes). The same measures that are applied for the first cycle continue to apply in the second cycle.

Regarding safeguard zones around drinking water protection areas, the situation seems to be very different in the different RBMPs in Spain as the following shows:

- Detail obtained from the Ebro RBMP refers to safeguard zones, explaining that only one protection zone has been formally approved so far, and that all other drinking water sources do have a safeguard zone (with either light or strong restrictions). However, the safeguard zones are apparently a proposal by the River Basin Authority only. According to the RBMP, the number of drinking water abstractions has been reduced from 3319 to 3258 from the first cycle to the second cycle; no justification for this change is provided.

- Information obtained from the Duero RBMP shows reporting on protection zones which will be established in the future; potentially harmful developments (e.g. irrigation, livestock or industrial areas) require a favourable municipal report.

- Information obtained from the Guadalquivir RBMP lists the drinking water protection areas and shows them in a map, differentiating whether the protection refers to water quality or quantity. From the river basin map, it appears that not all drinking water abstraction areas are protected, but the RBMP does not add information to show which proportion of the drinking water protection areas are already protected. In the Programme of Measures, one measure (€140000) is foreseen to revise or extend the protection areas, during the second and third planning cycle.

- The Jucar RBMP makes reference to the number of drinking water supply areas from surface and groundwater (1961 from groundwater). These are included in Annex 4 which lists the protected areas. However, the RBMP does not make any further statement regarding their status or level of protection.

General binding rules under Article 11(3)(h) are applied for nitrates and pesticides in all RBDs
The basic measures defined in Article 11(3)(h) for the control of diffuse pollution from agriculture at source are applied with the same rules across the whole of the following RBDs; Galicia-Coast, Andalusian Mediterranean, Guadalete and Barbate, Tinto, Odiel and Piedras, Catalan, Balearic Islands, Ceuta and Melilla. In all other basins there are differentiated rules for different parts of the RBDs[79].

[79] It must be taken into account that the adoption of this type of measures is a competence of the Autonomous Community, not of the RBD Authority.

For additional control measures on land (not just in safeguard zones but in the wider catchment) to prevent nitrogen, phosphorus or pesticides from entering drinking water sources, the situation is also very diverse as the following shows:

- Information obtained from the Ebro RBMP shows that there is only reference to voluntary measures in the first and second cycle. The measures listed include; studies to analyse the origin of nitrates and sulphates; nitrates risk assessment in an alluvial aquifer; studies to understand the reasons for infringement and to define measures; studies to understand drinking water supply vulnerability in specific areas, re-design of Nitrate Vulnerable Zones, agri-environmental experiments in some Navarra areas, and dissemination of agri-environmental measures. Aragon also includes controls of irrigation return flows as a specific measure. Most of these measures (at regional level) have been included in the previous RBMP and have now been modified.

- Information obtained from the Guadalquivir RBMP includes Measure 0283 aiming to extend the obligations of Nitrate Vulnerable Zones beyond their geographic scope; however the measure is only associated with a budget of €10000/year, and does not make specific reference to drinking water areas.

- Information obtained from the Jucar RBMP lists all measures to address diffuse agricultural pollution pressures. Outside Nitrate Vulnerable Zones, the following measures are included: 1) follow-up on the regulation for the use of sludge from wastewater treatment plants, 2) follow-up of the regulation on fertilizers, and waste from olive oil plants (in the Valencia region). One measure generally addresses improvement in the control of drinking water pollution, but its description does not refer to diffuse pollution in particular. All measures for diffuse pollution together have an estimated budget of less than €10000000 for the 2016-2021 period.

Farmers Unions have been consulted under the Public Consultation process in all basins.

Financing of agricultural measures is not secured in all basins.

It remains unclear if the application of the polluter pays principle in the agricultural sector has been fully implemented.

11.2 Main changes in implementation and compliance since the first cycle

Measures against erosion have been largely lacking in the first cycle but have been introduced in many basins in the second cycle. No specific scope was given for the measures related to agriculture in the first cycle. In the second cycle, the area of agricultural land to be covered by measures to achieve environmental objective is provided for several measures.

11.3 Progress with Commission recommendations

The Commission recommendations based on the first RBMPs and Programme of Measures requested action on the following:

- Recommendation: *Concerning agriculture, it is important to have more information on the link with relevant pressures (such as water abstraction) in order to address those pressures appropriately in the PoM.*

  Assessment: The main agricultural pressures on water quality and quantity have been identified in the Spanish RBMPs, they are: diffuse pollution (nutrients and chemicals), hydromorphological changes and abstractions in surface water and groundwater. A gap assessment has been partly performed and for all basins the number of measures or the investment needed to achieve the objectives is provided. The link between pressures and measures related to pollution from agriculture is fully established, but for abstractions related to agriculture this link is missing. Therefore, this recommendation has been partially fulfilled[80].

- Recommendation: *Ensure that appropriate basic measures are established for control of diffuse pollution. The basic measures for diffuse pollution should go beyond the Nitrates Directive codes of practice, which are voluntary instruments limited to nitrates issues. They do not address other agricultural pressures (phosphates, pesticides, etc.). Mandatory measures that are controllable should be included in the second RBMPs.*

  Assessment: In general as regard to diffuse pollution, Spanish RBMPs refer to the basic legislation and the implementation of Rural Development Programmes as basic elements. However, there is no specific assessment of how these have specifically contributed to the WFD objectives. Mandatory measures to reduce diffuse pollution seem to be established. However, it remains unclear if they go beyond Nitrate

[80] Spain subsequently clarified that the link is not reported due to a one to one correlation schema, but it is analysed in the RBPMs and that there are 1438 registers in the information reported linking surface and groundwater bodies with the pressure type '3.1 – Abstraction or flow diversion – Agriculture'.

Vulnerable Zones. Cost-effectiveness assessments are widely transferred from the first RBMPs, and it is unclear if any further assessments have been undertaken. Measures beyond Nitrate Vulnerable Zones have been rarely included in the Programme of Measures and are only reported with low budgets. Therefore, this recommendation has been partially fulfilled.

Topic 12 Measures related to pollution from sectors other than agriculture

12.1 Assessment of implementation and compliance with WFD requirements in the second cycle

In the context of this topic, pollution is considered in terms of nutrients, organic matter, sediment, saline discharges and chemicals (priority substances, river basin specific pollutants, groundwater pollutants and other physico-chemical parameters) arising from all sectors and sources apart from agriculture. KTM are groups of measures identified by Member States in their Programmes of Measures which target the same pressure or purpose. A KTM could be one national measure but would typically comprise more than one national measure. The same individual measure can also be part of more than one KTM because it may be multipurpose but also because the KTMs are not completely independent of one another.

KTMs[81] relevant to non-agricultural sources of pressures causing failure of WFD objectives have been reported for the majority of the RBDs in Spain. In total, five different KTMs have been reported which are:

KTM 1 – 'Construction or upgrades of wastewater treatment plants'

KTM4 – 'Remediation of contaminated sites (historical pollution including sediments, groundwater, soil)'

KTM17 – 'Measures to reduce sediment from soil erosion and surface run-off'

KTM 21 – 'Measures to prevent or control the input of pollution from urban areas, transport and built infrastructure'.

KTM 99 – 'Other key type measure reported under Programme of Measures (Historical pollution)'.

[81] Spain subsequently clarified that it has only identified one KTM per measure. Each measure has been associated with the KTM that best explains the reason for establishing that measure, without including others that could also benefit from the action. Thus, for example, many wastewater treatment plants have been linked to KTM-1, concealing the fact that they could also be associated to other KMTs. Therefore, the analysis in this chapter could lead to gaps in the reported data that do not really exist, but are merely a consequence of the data organisation system.

The Spanish RBMPs have not reported the significant pressures tackled by KTM15 - Measures for the phasing-out of emissions, discharges and losses of Priority Hazardous Substances or for the reduction of emissions, discharges and losses of Priority Substances and KTM16 - Upgrades or improvements of industrial wastewater treatment plants (including farms). However, these KTM have been mapped against national measures.

The WFD specifies that the Programme of Measures shall include, as a minimum, 'basic measures' and, where necessary to achieve objectives, 'supplementary measures' when basic measures are not enough to address specific significant pressures (see the chapter 9 in this report).

Quantitative information on basic and supplementary measures used to tackle pollution from non-agricultural sources (number of measures per KTM) is provided for 18 RBDs in Spain. The number of basic measures to tackle pollution from non-agricultural sources is provided for 10 types of basic measures incorporated into each KTM for 16 out of 18 Spanish RBDs (such information is not provided for the RBDs Balearic Islands, and Melilla).

Spain provided more targeted information on basic measures required under Article 11(3)(c to k). Use of authorisation and/or permitting regime to control waste water point source discharges (Basic measures Article 11(3)(g)) is in place in the majority of the Spanish RBDs for surface and groundwater. Similarly, a register of waste water discharges (Basic measures Article 11(3)(g)) is available in most of the Spanish RBDs for surface and groundwater.

In all 18 Spanish RBDs which reported information, the waste water discharges subjected to legal authorization, in accordance with the Spanish Law, in order to guarantee the protection of the waters (Basic measure Article 11(3)(g)). Some direct discharges to groundwater are authorised in accordance with Article 11(3)(j).

Spain reported that the measures to eliminate or reduce pollution from Priority Substances and other substances (Basic measures Article 11(3)(k)) are missing in almost half of the RBDs.

As far as measures for all those Priority Substances causing failure are concerned, in the Ebro RBMP only a few surface water bodies have been classified for their chemical status, i.e., monitoring of Priority Substances have been carried out. From the measures included in this RBMP it is unclear how the measures will address the chemical pollution, and an Article 4(4) exemption has been applied until 2027. The only two water body groups for which measures for chemical status have been included in the RBMP are those containing the industry-polluted

sites of Flix and of Sabiñánigo. The measure group A16 addresses both of them with a set of 10 measures, out of which three have been finished in 2015, and two are on-going with no budget allocation for the 2016-2021 period. The overall budget for A16 for the second planning cycle is €75 million, and no budget is foreseen for the 3rd planning cycle. Given that the Ebro river basin district is one of the most industrial ones of Spain, the number and volume of such measures seems extremely low. In the Catalan RBD, KTMs have been reported for 4-nonylphenol, endosulfan, chlorpyrifos, terbuthylazine, lead and its compounds, mercury and its compounds, nickel and its compounds and metolachlor.

In the Catalan RBD, a number of chemical substances were reported as relevant River Basin Specific Pollutants, even though these include Priority Substances: 4-nonylphenol, total benzo(g,h,i)-perylene + indeno(1,2,3-cd)-pyrene and Sum of: aldrin, dieldrin, endrin and isodrin. The RBMP includes a list of eight water bodies which are prioritised for action as they e.g. affect drinking water protection areas. However, the RBMP also indicates that only one of these eight water bodies is targeted with a specific action to reduce industrial pollution. Furthermore, it should be noted that out of the four measures (with € 700000 budget for the second planning cycle) all are targeting collecting information on the pollution, and none is directly addressing pollution reduction.

As far as measures for all those pollutants causing failure of good chemical status in groundwater are concerned, in the Catalan RBD, volatile organic halogens (VOX) are detected, and are addressed by other KTM. In this RBMP almost half of the groundwater bodies are reported to be in bad chemical status; though the source of pollution is not specified. The Programme of Measures does not specify any measures for groundwater bodies related to industrial pollution.

12.2 Main changes in implementation and compliance since the first cycle

In the first cycle the Programmes of Measures did not specify which substances are targeted by each measure.

In the second RBMPs, measures are reported for some substances causing non-compliance.

For surface waters in some RBDs there are substances which are causing failure of objectives for which no measures have been planned. The Programmes of Measures do not specify any measures for groundwater bodies related to industrial pollution and do not provide clear information about measures addressing River Basin Specific Pollutants. Measures to eliminate

or reduce pollution from Priority Substances and other substances (Basic measures Art11(3)(k)) are missing from most of the RBDs.

Spain subsequently provided the following explanation with a view to clarifying the design of the Programme of Measures:

Spain submitted the document "Classification of the Measures in Spain", in which it can be seen that the structure proposed for the database used for the report to the European Commission considers different interpretations when it comes to the ratio of the measures with the KTMs, the latter allowing 1:n ratios, whereas in Spain the ratio is 1:1. The KTM measures referred to are:

- KTM15 - Measures for the phasing-out of emissions, discharges and losses of Priority Hazardous Substances or for the reduction of emissions, discharges and losses of Priority Substances

- KTM16 - Upgrades or improvements of industrial wastewater treatment plants (including farms).

For both cases there is hardly any measure associated to them, because the measures for reducing pollution by Priority Substances will initially have to be classified mainly as measures for reducing pollution from point sources or measures for reducing pollution from diffuse sources, and will thus be allocated to different KTMs. The only specific measure for KTM15 concerns preparing the inventories for emissions, discharges and losses of priority substances.

In the case of the measures for improving industrial wastewater treatment plants, an overwhelming majority of them will be included within the types of measures for reducing point sources. In fact, the measures reported associated with KTM15 are as follows:

KTM_Description	ES017	ES020	ES070	ES080	ES100	General Total
KTM15 - Measures for the phasing-out of emissions, discharges and losses of Priority Hazardous Substances or for the reduction of emissions, discharges and losses of Priority Substances	6	3	1	4	2	16
General Total	**6**	**3**	**1**	**4**	**2**	**16**

The fact that there are no measures with KTM15 in most of the RBDs is explained by the way in which the information about the measures has been organised in the Spanish database.

12.3 Progress with Commission recommendations

The Commission made one relevant recommendation based on the first RBMPs and first Programmes of Measures:

Recommendation: "*[The identification of river basin specific pollutants needs to be more transparent, with clear information on how pollutants were selected, how and where they were monitored, where there are exceedances and how such exceedances have been taken into account in the assessment of ecological status.] It is important to take an ambitious approach to combatting chemical pollution and that adequate measures are put in place.*"

Assessment: The reporting of the relevant information in the Spanish RBMPs makes it difficult to assess the level of ambition, because it is not clear to what extent the measures identified will tackle the pollutants causing failure. This recommendation is partially fulfilled.

Topic 13 Measures related to hydromorphology

13.1 Assessment of implementation and compliance with WFD requirements in the second cycle

Significant hydromorphological pressures are identified in all RBDs. The sectors associated to the significant hydromorphological pressures reported in Spain are very diverse. The following sectors are driving hydromorphological pressures for the largest number of water bodies: flood protection and agriculture (including for the purpose of irrigation). In some RBDs, the following sectors are associated to a high number of water bodies affected by dams: hydropower, industry, drinking water and recreation. Furthermore, a significant number of water bodies are affected by hydromorphological pressures, whose driver is unknown/obsolete or indicated as "other" (not specified as one of the key sectors in the WISE reporting).

Operational KTM to tackle significant hydromorphological pressures are reported for 15 out of 18 reported RBDs. The main KTM made operational to reduce hydromorphological pressures are KTM99- 'other measures', and in a few RBDs KTM6. – 'improving hydromorphological conditions of water bodies other than longitudinal continuity'.

The types of specific hydromorphological measures planned are diverse across the different RBDs, including fish ladders, sediment management, removal of physical structures, re-meandering, setting of ecological flows, river and floodplain restoration, managed aquifer recharge as natural water retention measure, amongst others.

No operational KTM to tackle hydromorphological pressures are reported for Guadalquivir, Balearic Islands and Ceuta (it is noted that, in Ceuta, all surface water bodies are coastal) At the same time, for these three RBDs, national measures are mapped against certain KTM relevant to hydromorphology (mainly KTM7 - improvements in flow regime and/or establishment of ecological flows or KTM99 - other measures). This discrepancy seems to be related to an incomplete reporting into WISE due to Spanish legal meaning of the significance of a pressure and inherent difficulties to reflect the reality in the reporting model.

In terms of basic measures, there is an authorisation and/or permitting regime in place to control physical modifications, which covers changes to the riparian area of water bodies, as well as a register of physical modifications of water bodies in all reported RBDs, according to WFD Article 11(3)(i).

Overall, management objectives for restoring river continuity have been set in 13 out of 18 reported RBDs. In addition, the management objectives for continuity are quantitative for 11 out of the 13 RBDs which have set such objectives. Nevertheless, KTM5 (improving longitudinal continuity) was reported as an operational measure to tackle significant pressures in some RBDs.

Win-win measures in terms of achieving the objectives of the WFD and Floods Directive, drought management and use of Natural Water Retention Measures are reported to be included in the Programme of Measures of all reported RBDs. However, the specific KTM23 on Natural Water Retention Measures was applied to tackle significant pressures in some RBDs. At the same time, specific measures included in the second RBMPs have clear links to Natural Water Retention Measures, e.g. the removal of weirs, river and floodplain restoration, managed aquifer recharge and erosion-preventing measures. However, the RBMPs do not provide clear explanations of how such measures contribute to water retention in their specific context.

The design of new and existing structural measures, such as flood defences, storage dams and tidal barriers, is reported to have been adapted to take into account WFD objectives in all RBDs.

Ecological flows have been derived for all relevant water bodies in all reported RBDs, but have been implemented only in some of the water bodies (work still ongoing). The timeline for completing the process of implementing ecological flows differs for different RBDs. E.g. in the RBD Guadiana all activities for the implementation of ecological flows are programmed until 2021. Other RBDs (e.g. Guadalquivir, Segura and Ebro) programme studies for the implementation of ecological flows until 2027, so that at least partially ecological flows will not be in place by the end of the second planning cycle. For some RBDs, no information is given on the timeline for completing the implementation of ecological flows.

The second RBMPs make reference to actions of prioritising the implementation of ecological flows in ‘strategic’ or priority river stretches in the second cycle and in non-priority stretches by 2027. They also refer to certain specific measures for the implementation of ecological flows, such as the control or review of water rights and concessions, infrastructural changes at dams to allow for the discharge of ecological flows, new gauging stations for control of ecological flows, further studies and monitoring of ecological flows.

Indicators on the gap to be filled for significant hydromorphological pressures are provided for all RBDs. Progress indicators for the KTM tackling significant hydromorphological pressures

are only reported for three out of 18 RBDs (Miño-Sil, Jucar and Catalan RBDs). In Jucar, the number of water bodies affected by significant hydromorphological pressures will be reduced by around 10 % until 2021 by taking one of two required measures. It is unclear whether the remaining 90 % of the pressure gap to achieve the objectives will be tackled with the measure taken between 2021 and 2027. In Catalan and Miño-Sil RBDs, the information provided is not fully clear as KTM indicator values are only reported for 2015. At the same time, the level of the significant hydromorphological pressures does not drop between 2015 and 2021 but drops to zero from 2021 to 2027. This may imply either that measures are taken in the second cycle which will not reduce the pressures by 2021 but will eliminate the pressures by 2027, or that no measures are taken by 2021 but all measures are taken between 2021 and 2027. Overall, very little can be concluded on the level of ambition in tackling hydromorphological pressures in Spain as a whole.

13.2 Main changes in implementation and compliance since the first cycle

Concerning the coverage of hydromorphological measures in the different RBDs, hydromorphological measures are reported for more RBDs in the second RBMPs than was the case in the first cycle. However, the second RBMPs do not explicitly discuss elements of progress on hydromorphological measures comparing them to the planning under the first plans.

13.3 Progress with Commission recommendations

- Recommendation: *Ensure that the Ecological Flows established guarantee good ecological status. If this is not the case, report transparently the deviations and the justifications on the basis of technical feasibility or disproportionate costs. In the relevant water bodies, consider the objectives of water-dependent protected habitats and species in setting Ecological Flows.*

  Assessment: Specific information on ecological flows in some of the second RBMPs indicates that their setting has considered hydro-biological criteria, as per a few fish species, and their preference curves associated to habitats. Based on the information found, it cannot be concluded how much ecological flows contribute to achieving the WFD objectives or whether the most adequate fish species in terms of conservation and requirements have been chosen for this exercise. In the current regulatory framework (Spanish Hydrological Planning Instruction, 2008), ecological flows restrictions can be lowered except when affecting Natura 2000 or Ramsar sites. These limitations

however, are no longer included in the draft Instruction for Drought Management. Spain subsequently informed that the requirement is set in higher regulations, both in the Regulation of Hydrological Planning and in the Regulation of the Public Hydraulic Domain, which was precisely modified in 2016 to advance harmoniously in the definition and implementation of the ecological flow regimes. Overall, not enough information on progress regarding the specific issues raised in this recommendation could be found in the plans, and thus is considered partially fulfilled.

- Recommendation: *Avoid presenting the maintenance of ecological flow in new dams as an ecological benefit of the dam, but consider it as a mitigation measure. Justify the flood protection share on a case by case basis, including the justification that there is no better environmental option.*

  Assessment: The second part of this recommendation is assessed under the chapter on environmental objectives and exemptions. For the first part of this recommendations, in some of the second RBMPs (e.g. for RBDs Guadalquivir and Ebro), evidence has been found that the maintenance of ecological flow is considered still as an ecological benefit of the dam. Spain subsequently informed that the Government issued a regulatory rule that modified the Regulation of the Public Hydraulic Domain in 2016 to harmoniously clarify all these issues. The ecological flows are a restriction imposed to exploitation systems. With this new regulatory rule, the recommendation would be fulfilled, but this has not been subject of this assessment.

- Recommendation: *Consider and prioritise the use of green infrastructure and/or natural water retention measures that provide a range of environmental (improvements in water quality, increase of infiltration and thus aquifer recharge, flood protection, habitat conservation etc.), social and economic benefits which can be in many cases more cost-effective than grey infrastructure, as well as other restoration measures, removal of dams and other hydro morphological barriers.*

  Assessment: The specific KTM23 on Natural Water Retention Measures is not applied to tackle significant pressures in any of the RBDs. At the same time, specific measures included in the second RBMPs have clear links to Natural Water Retention Measures, e.g. the removal of weirs, river and floodplain restoration, managed aquifer recharge and erosion-preventing measures. However, the RBMPs do not provide clear explanations of how such measures contribute to water retention in their specific context. Furthermore, no reference was found in the RBMPs to a national or regional

strategy that prioritises the implementation of natural water retention and green infrastructure measures. This recommendation has been partially fulfilled.

Topic 14 Economic analysis and water pricing policies

14.1 Assessment of implementation and compliance with WFD requirements in the second cycle and main changes in implementation and compliance

According to the reported information, water services include drinking water abstraction (surface and groundwater supply), irrigation, urban water supply, self-abstraction, reuse and desalinisation and wastewater collection and treatment.

The information included in the RBMPs for the second cycle is more detailed compared to the first cycle and separately presented, and the relevant water uses that might contribute to cost recovery of water services per Article 9 have been identified at RBD level. The second RBMPs include the estimation of the financial, environmental and resource costs of the water services, as well as the income obtained by the different existing cost recovery instruments for the different water services in Spain.

The environmental costs of water services have not been internalised in all the RBMPs. Resource costs have been analysed, with a justification for cases for which this was not done.

A general methodology for calculating cost recovery was provided by the General Directorate of Water to be applied in all RBDs, including guidelines for calculating financial and environmental costs and an approach to estimate resource costs. As a result, RBMPs include a harmonised presentation of cost recovery rate results. Also, the methodology for Environmental Costs has been streamlined resulting in significantly higher estimations of the costs than in the first planning cycle and higher lower cost recovery rates.

The national average cost recovery rate is 80 % for financial costs, 68 % when including (the considered) environmental costs. The cost recovery rate for self-abstraction in both agriculture and urban/industry sectors is stated to be 75 % and 79 % respectively.

Most RBMPs include a brief justification of subsidies and not-applying cost recovery for applying Article 9(4), based on criteria such as the economic, social and environmental sustainability, the preservation of landscape and tradition, avoiding erosion and desertification, maintaining population in the countryside and diminishing the rural exodus as well as its support to the agri-food industry and employment in the rural areas, promoting adaptation to climate change. This is however documented only in short text form without further supporting analysis.

Subsidies are mentioned for reuse and desalinisation, extraordinary measures to reduce costs for water supply on farms, European Union investments for irrigation infrastructure, drought situations, and water supply investments. Another type of subsidy is the so-called 'discounts' from cost recovery, which are for example, applied to the 'impoundment tariff' or 'dam infrastructure costs' due to 'flood protection' or other non-user specific beneficiaries like 'restoration'.

Regarding incentive pricing, some instruments target environmental costs but important gaps remain, in particular regarding self-abstraction and diffuse pollution. A limited share of the irrigated area is estimated to have metering systems in place, and there are no plans presented to increase this number significantly, apart from modernisation projects funded by the European Agricultural Fund for Rural Development.

Regarding the adequate contribution of water uses, not all agricultural users pay for water.

Overall, more information has been presented as compared to the first RBMPs, an updated economic analysis has been done as well. On most of the topic issues, important methodological progress can be noted, as well as the effort to present information in a more homogenised manner (which is evident from the WISE reporting).

14.2 Progress with Commission recommendations

- Recommendation: *The cost-recovery should address a broad range of water services, including impoundments, abstraction, storage, treatment and distribution of surface waters, and collection, treatment and discharge of waste water, also when they are "self-services", for instance self-abstraction for agriculture. The cost recovery should be transparently presented for all relevant user sectors, and environment and resource costs should be included in the costs recovered. Information should also be provided on the incentive function of water pricing for all water services, with the aim of ensuring an efficient use of water. Information on how the polluter pays principle has been taken into account should be provided in the RBMPs.*

- Recommendation: *Introduce volumetric abstraction fees for all users (including self-abstraction of groundwater) covering properly calculated environmental and resource costs. Ensure that the cost-recovery instruments are adapted as soon as possible to the WFD to ensure that they provide adequate incentives to use the water efficiently. In addition, the revenues of cost-recovery instruments should be sufficient for the river*

basin authorities to effectively execute their water management tasks (update and maintenance of register of abstractions, monitoring, etc.).

Develop a basic harmonisation of the minimum elements to be included in water tariffs for drinking water supply and waste water treatment for the second RBMPs to ensure long-term sustainability of investments in water protection across the country.

Consider water use for energy production (hydropower and cooling) as a water service, and present relevant information (cost recovery, environmental and resource costs, "discount rates for dams") transparently in the updated RBMPs.

Present transparently subsidies and cross-subsidies in the second RBMPs (i.e. desalinated water, dam construction, etc.) and justify dam discount calculation on a case by case basis.

Extend calculation of environmental costs to costs related to energy production (hydropower, cooling) and diffuse pollution from agriculture.

Assessment: According to the reported information, water services include drinking water abstraction (surface and groundwater supply), irrigation, urban water supply, self-abstraction, reuse and desalinisation and wastewater collection and treatment. At the level of the RBD, the information is more specific, also with regard to the water uses contributing to the recovery of costs.

The second RBMPs contain a homogenous estimation of the degree of cost recovery of water services. In order to guarantee the harmonization of calculation criteria and comparability of results, CIS WFD guidance documents have been used.

Financial costs, including capital, operation and maintenance costs have been calculated for each reported service (surface and groundwater supply, irrigation, urban water supply, self-abstraction, reuse and desalinisation and wastewater collection and treatment). Also in this case, information provided in RBMPs is more detailed than that reported on WISE.

The national average cost recovery rate is 80 % for financial costs, 68 % when including environmental costs. However, there are wide variations among RBDs, ranging from 35 % (Galicia-Coast) and 37,5 % (Miño-Sil) to 91 % (Tagus) or 94 % (Guadalete and Barbate) for financial costs; or from 34 % (Miño-Sil) to 86 % (Guadalete and Barbate) when including the environmental costs.

The cost recovery rate for self-abstraction in both agriculture and urban/industry sectors is stated to 75 % and 79 % respectively and 95 % and 92 % when including environmental costs.

Most RBMPs include a brief justification of subsidies and not-applying cost recovery for applying Article 9(4). This is however documented only in short text form without further supporting analysis.

Regarding incentive pricing, some instruments target environmental costs but important gaps remain, in particular regarding self-abstraction and diffuse pollution. In Spain the price paid for water is only partially based on the volume of water abstracted by individual agricultural user or the volume abstracted by collective irrigation networks. Holders of administrative water concessions and private water users are entitled to their private use, are obliged to install and maintain appropriate metering systems to ensure the provision of accurate information on the water actually consumed or used or returned to the environment. This obligation, which obviously includes agricultural users, has been already reinforced by the main water regulations since the consolidated text of the 2001 Water Act, Article 55. According to the commitments undertaken by virtue of the Association Agreement, the effectiveness of the recovery instruments and, when appropriate, their revision, is being considered by Spain regarding the present and future economic and financial regime of the water use. Nevertheless, despite these legal provisions not all irrigation users, especially those with older surface irrigation systems, have metering systems able to provide a reliable quantification. In Spain only a limited share of the irrigated area is estimated to have metering systems in place, and there are no plans presented to increase this number.

Regarding the adequate contribution of water uses, not all agriculture users pay for water. All users in Spain are stated to pay for the water services, although there is some room for improvement related to the cost recovery of the water as resource itself. Irrigators connected to a public water network pay for the Water Canon[82], irrigators using self-services pay their own costs when using self-services, e.g. paying for the energy costs of pumping when abstracting themselves water from a groundwater body or from a surface water body intake only for their own plot. This applies to all users. No thresholds are foreseen in the Water Act for the application of cost recovery of water services.

[82] Water Canon in Spanish “Canon del Agua”

Subsidies are mentioned for reuse and desalinisation, extraordinary measures to reduce costs for water supply on farms, European Union investments for irrigation infrastructure, drought situation Royal Decree, and water supply investments. Another type of subsidies are the so-called "discounts" from cost recovery, which are e.g. applied to the "impoundment tariff" or "dam infrastructure costs" due to flood protection or other non-user specific beneficiaries. The Spanish RBMPs consider that these shall be paid by the public and not by specific users, and their amount is estimated and of different nature in the RBDs. In some of the RBMPs, the % values are explicitly included, in others only a general reference but no figures are provided.

The environmental costs of water services, which still have not been fully internalised, are calculated as the equivalent annual cost of the measures to be implemented in order to correct the pressures caused by such water services and thus meet the objective of good status or good ecological potential. These measures include usually all pending measures needed to achieve objectives in the 2016-2027 period. Also, there are differences in the RBMPs on calculating environmental costs.

It is important to note that, according to the state-level general methodology, diffuse pollution from agriculture is considered an environmental cost, although there is no general instrument in Spain for its recovery. Some estimations have been made in several RBMPs such as in those in Western Cantabrian, Duero, Guadiana, Guadalquivir, Andalusian Mediterranean Basins, Segura and Jucar; whilst not in all. Note also the recent Upper Court decision (March 2017) revoking part of the Jucar RBMP and requesting application of the polluter pays principle to cover the additional costs of urban water supply services affected by nitrates pollution.

Resource costs are considered relevant only when there is an inefficient allocation among users (once environmental considerations are also taken into account). This means that when there is a water shortage, either in quantity and/or quality, other alternatives generate a greater economic value. According to Article 7(4) of the Spanish Hydrological Planning Instruction, resource costs will be valued as the cost of scarcity, meaning the opportunity cost that arises when a scarce resource is allocated to one use rather than another. Its calculation is normally based on market prices, and where there are no water markets this is usually considered not significant; the result is that resource costs are not recovered. Also, there are differences in the RBMPs on calculating resource costs.

In summary, the recommendations by the European Commission are addressed only in a limited way (e.g. no change can be appreciated in the treatment of cost recovery for self-abstraction from groundwater, there are no indications to harmonise cost recovery mechanisms in accordance with the polluter pays principle). A stepwise increase of volumetric pricing seems to be in place for urban, industrial and irrigation uses. However, this is not documented in most RBMPs.

Topic 15 Considerations specific to Protected Areas (identification, monitoring, objectives and measures)

15.1 Assessment of implementation and compliance with WFD requirements in the second cycle

For the second RBMPs, Spain has reported Protected Areas for all the relevant Directives (Table 15.2). There have been considerable changes in the number of some Protected Areas from the first to second cycle; e.g. the number of Protected Areas designated under the Habitats and Birds Directives have increased by more than 30 %[83].

Table 15.1 Number of protected areas of all types in each RBD of Spain, for surface and groundwater

Protected Area type	Number of Protected Areas associated with[84]				
	Rivers	Lakes	Transitional	Coastal	Groundwater
Abstraction of water intended for human consumption under Article 7	1239	8	4		7485
Recreational waters, including areas designated as bathing waters under Directive 76/160/EEC[85]	200	18	79	1543	
Protection of species where the maintenance or improvement of the status of water is an important factor in their protection, including relevant Natura 2000 sites designated under Directive 79/409/EEC (Birds)[86]	282	65	51	79	303
Protection of habitats or species where the maintenance or improvement of the status of water is an important factor in their protection, including relevant Natura 2000 sites designated under Directive 92/43/EEC (Habitats)[87]	708	101	83	145	732

[83] Spain subsequently clarified that there was a 30 % increase and not 60 % because there are some duplicates in the WISE data.

[84] Spain subsequently informed the Commission that the reported information in WISE was not accurate. This table reflects the updated/corrected data.

[85] Directive 2006/7/EC of the European Parliament and of the Council of 15 February 2006 concerning the management of bathing water quality and repealing Directive 76/160/EEC http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32006L0007.

[86] Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32009L0147.

[87] Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:31992L0043.

Protected Area type	Number of Protected Areas associated with[84]				
	Rivers	Lakes	Transitional	Coastal	Groundwater
Nutrient-sensitive areas, including areas designated as vulnerable zones under Directive 91/676/EEC (Nitrates Directive)[88] and areas designated as sensitive areas under Directive 91/271/EEC (Urban Wastewater Treatment Directive)[89]	310	44	53	111	102
Areas designated for the protection of economically significant aquatic species	700	4	92	175	0

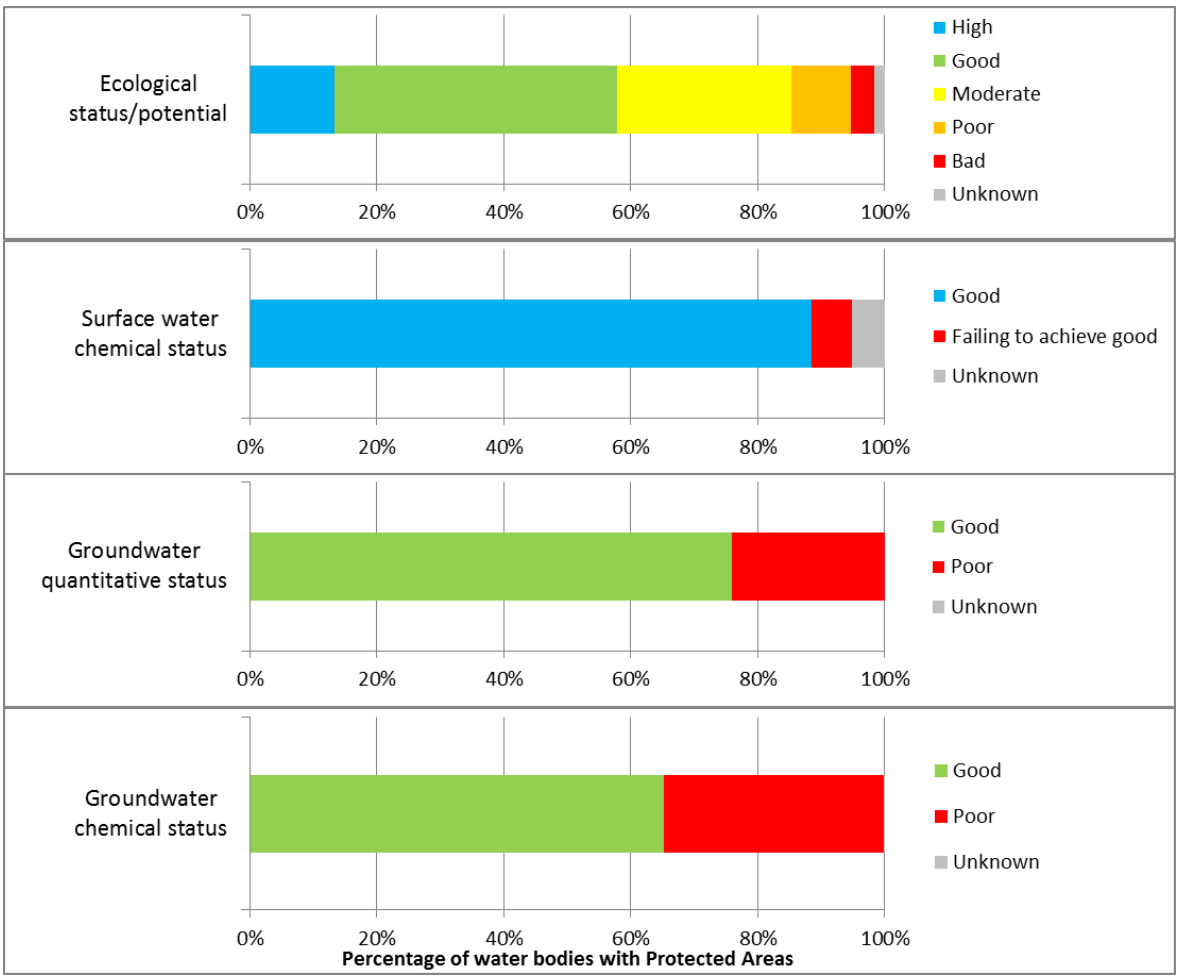
Source: Member States reporting to WISE

A good overview of the status of surface and groundwater water bodies associated with Protected Areas is also reported (Figure 15.1) with the status classification reported with either high or medium degrees of confidence.

[88] Council Directive 91/676/EEC of 12 December 1991 concerning the protection of waters against pollution caused by nitrates from agricultural sources http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:31991L0676.

[89] Council Directive 91/271/EEC of 21 May 1991 concerning urban waste-water treatment http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:31991L0271.

Figure 15.1 Status of water bodies associated with the Protected Areas report for Spain. Note: based on status/potential aggregated for all water bodies associated with all Protected Areas



Source: WISE electronic reporting

Table 15.2 Number of protected areas of all types in each RBD of Spain, for surface and groundwater

Protected Area type	Number of Protected Areas associated with[90]				
	Rivers	Lakes	Transitional	Coastal	Groundwater
Abstraction of water intended for human consumption under Article 7	1239	8	4	0	7485
Recreational waters, including areas designated as bathing waters under Directive 76/160/EEC[91]	200	18	79	1543	0
Protection of species where the maintenance or improvement of the status of water is an important factor in their protection, including relevant Natura 2000 sites designated under Directive 79/409/EEC (Birds)[92]	282	65	51	79	303
Protection of habitats or species where the maintenance or improvement of the status of water is an important factor in their protection, including relevant Natura 2000 sites designated under Directive 92/43/EEC (Habitats)[93]	708	101	83	145	732
Nutrient-sensitive areas, including areas designated as vulnerable zones under Directive 91/676/EEC (Nitrates Directive)[94] and areas designated as sensitive areas under Directive 91/271/EEC (Urban Wastewater Treatment Directive)[95]	310	44	53	111	102
Areas designated for the protection of economically significant aquatic species	700	4	92	175	0

Source: Member States reporting to WISE

Spain reported that, for Protected Areas designated under the Birds and Habitats Directives, additional objectives have been set only in a few RBMPs and for a small number of Protected Areas. In the few RBDs where specific objectives have been set, they are either fulfilled or further work is required to establish the needs of the water dependent interest features. For the

[90] Spain subsequently informed the Commission that the reported information in WISE was not accurate. This table reflects the updated/corrected data.

[91] Directive 2006/7/EC of the European Parliament and of the Council of 15 February 2006 concerning the management of bathing water quality and repealing Directive 76/160/EEC http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32006L0007.

[92] Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32009L0147.

[93] Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:31992L0043.

[94] Council Directive 91/676/EEC of 12 December 1991 concerning the protection of waters against pollution caused by nitrates from agricultural sources http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:31991L0676.

[95] Council Directive 91/271/EEC of 21 May 1991 concerning urban waste-water treatment http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:31991L0271.

main part, the approach is not to designate specific objectives because the objectives of the WFD are sufficient to also fulfil the objectives according to other Directives. Spain subsequently clarified that all the objectives of WFD cover the objectives of the areas within the Natura 2000 Network.

For areas designated for the protection of economically significant aquatic species (shell fish), in general, additional objectives have been set in terms of the microbiological standards set in the repealed Directive. However, for a few, no objectives have been set.

With respect to Drinking Water Protected Areas (in surface and groundwater), specific objectives have been set only in one RBMP (Miño-Sil).

Monitoring sites of surface water associated with Protected Areas are reported for all Protected Area types (Table 15.3). Further information on the purpose of monitoring sites for surface water and groundwater status assessment can be found in Chapters 3 and 4 (ecological and chemical status of surface waters) and Chapters 5 and 6 (quantitative and chemical status of groundwater bodies).

Comparing the number of reported number of Protected Areas and the number of monitoring sites associated with Protected Areas in Spain indicates that the monitoring programme reported in 2016 is insufficient to cover the needs. For example, in the Eastern Cantabrian and Western Cantabrian RBDs, a total of approximately 116[96] Protected Areas designated under the Habitats Directive is reported but with no associated monitoring sites. Furthermore, in the Andalusian Mediterranean Basins, where all Protected Area types are reported, the reported monitoring programme only covers areas designated in relation to shell fish (but then only in rivers) and Drinking Water Protected Areas for surface waters[97].

The monitoring programme has been changed in several ways between the first and second cycles. Firstly, no monitoring activities have been reported in the second cycle for Protected Areas designated under the Birds Directive whereas monitoring was in place for these Protected Areas in the first cycle. The number of monitoring sites associated with Drinking Water Protected Areas has decreased for both surface and groundwater bodies but mostly for groundwater monitoring (approximately reduced to a third of the sites in the second cycle

[96] Spain subsequently clarified that 102 Protected Areas are designated under the Habitats Directive in these RBDs.

[97] Spain has informed the Commission that this could be due to an error in the reporting of the stations, where this WFD stations would not have been marked as they also informed about Protected Areas.

compared to the first). A similar picture emerges for monitoring in relation to Protected Areas designated under the Nitrates and Bathing Water Directives.

Table 15.3 Number of monitoring sites associated with Protected Areas in Spain.

Protected Area type	Number of monitoring sites associated with Protected Areas in[98]				
	Rivers	Lakes	Transitional	Coastal	Groundwater
Abstraction of water intended for human consumption under Article 7	911	11	7	6	1487
Recreational waters, including areas designated as bathing waters under Directive 76/160/EEC	124	17	59	366	0
Protection of habitats or species where the maintenance or improvement of the status of water is an important factor in their protection, including relevant Natura 2000 sites designated under Directive 92/43/EEC (Habitats) and Directive 79/409/EEC (Birds)	675	17	1	0	18
Nutrient-sensitive areas, including areas designated as vulnerable zones under Directive 91/676/EEC (Nitrates Directive)	65	5	5	79	1542
Nutrient-sensitive areas, including areas designated as sensitive areas under Directive 91/271/EEC (Urban Wastewater Treatment Directive)	312	2	20	3	0
Areas designated for the protection of economically significant aquatic species	43	2	48	0	0

Source: WISE electronic reporting

The monitoring programme associated with Protected Areas designated under the Habitats Directive has increased significantly in a few RBDs, taking the network from 200-300 sites in the first RBMP to over 900 sites in the second cycle. But still, only seven RBDs have a specific monitoring of Protected Areas designated under the Habitats Directive even though such areas are reported in the status assessment for all RBDs and even with high confidence.

Groundwater monitoring is only reported in WISE for 11 RBDs[99], although the status (both quantitative and qualitative) is reported for groundwater bodies for nearly all 18 Spanish RBDs and for a considerable part with high confidence.

[98] Spain subsequently informed the Commission that the reported information in WISE was not accurate. This table reflects the updated/corrected data.

[99] Spain subsequently stated that groundwater monitoring of water bodies associated with Protected Areas takes place in 14 RBDs.

The status assessment of surface and groundwater bodies associated with Protected Areas is reported for all Protected Areas - by type and number. It is the general picture that the status assessment is made with a high or medium confidence. A reliable assessment of status, especially with high or medium confidence, implies an adequate underlying monitoring programme. However, the reported number of monitoring sites indicates a limited monitoring programme which by no means covers the rather high number of Protected Areas in some RBDs and for some types of Protected Area, there are no monitoring sites at all. For example, in the Eastern Cantabrian and Western Cantabrian RBDs, the reported monitoring programme is very limited and covers only Protected Areas related to a few Directives[100] . Nevertheless, the status assessment is reported for all Protected Areas and for all with high confidence. For groundwater, both the quantitative and the chemical status assessment are made for all RBDs and mainly made with high or medium confidence. However, monitoring activities have only been reported to WISE for 14[101] RBDs.

With respect to measures, safeguard zones in connection with Drinking Water Protected Areas have been established in all RBDs and there are no plans to change the regulations as a result of this RBMP. In the safeguard zones, there is a ban for changes to the landscape, excavation and any kind of construction, permissions for the discharge of waste water can be revised and other types of activities (like livestock production or industrial activity) require an assessment before the can commence.

For other types of Protected Areas, additional objectives have largely not been set and consequently no additional measures would be expected.

Exemptions have been applied for all types of surface water Protected Area with the exception of those under Article 4(7). On average, 11 % of the water bodies associated with Protected Areas have had exemptions applied ranging from 0 % for Drinking Water Protected Areas to 20 % for those designated under the Habitats and Bathing Water Directives. For groundwater, only 2 % of the water bodies associated with Protected Areas designated under the Habitats, Birds and Nitrate Directives have had exemptions applied. Further assessment of the exemptions applied in Spain is provided in Chapter 8.

[100] Spain subsequently clarified that ES017 and ES018 reported sites related to the following monitoring purposes: Abstraction of water, Nitrates, Sensitive areas, Recreational waters, Shellfish.

[101] Spain informed the Commission that it was reported for 14 RBDs: ES010, ES017, ES018, ES020, ES030, ES040, ES050, ES063, ES064, ES070, ES080, ES091, ES100 and ES110.

15.2 Main changes in implementation and compliance since the first cycle

The number of Protected Areas has changed in many instances. For example, in the Duero RBD, the number of protected areas under the Habitats Directive increased from 78 in the first cycle to 86 in the second.

The monitoring program has changed in several ways. Firstly, no monitoring activities have been reported in the second cycle for Protected Areas related to the Birds Directive in contrast to the first cycle, where specific monitoring was performed[102].

Monitoring of Drinking Water Protected Areas has decreased for both surface and groundwater bodies; mostly for groundwater monitoring (decreased to approximately one third of the extent reported in the first cycle in the second). A similar picture emerges for monitoring in relation to Protected Areas designated under the Nitrates and Bathing Water Directives.

The extent of monitoring related to Protected Areas designated under the Habitats Directive has increased significantly for a few RBDs with 200-300 sites in the first RBMP to over 711 sites in the second cycle. But still, only half of the RBDs have a specific monitoring of Protected Areas designated under the Habitats Directive; although water bodies associated with these Protected Areas are reported in the status assessment for all RBDs and even with high confidence.

15.3 Progress with Commission recommendations

- Recommendation: *Ensure monitoring includes all relevant parameters of the drinking water Directive:*

  Assessment: The information reported to WISE for the second cycle does not allow for a check on the parameters monitored in Drinking Water Protected Areas. However, the very limited extent of specific monitoring of these areas indicates that the extent of monitoring in itself is of concern. Progress with this recommendation could not be assessed.

- Recommendation: *Define status of Protected Areas to ensure a harmonized approach across the country*.

[102] Spain subsequently clarified that when establishing the indicators or metrics for evaluating the environmental status, it took into account the environmental requirements of protected areas, which explains why no additional objectives were needed

It is not possible to check if such a common approach has been implemented. The reported status assessment of water bodies associated with Protected Areas is very comprehensive covering all Protected Area types. However, a very limited monitoring program specific for Protected Areas has been reported – a program not covering all Protected Area types and not by far all of the areas reported. Progress has been made with the definition of the status assessment of water bodies associated with Protected Areas, but the existence of a harmonised approach could not be assessed. This recommendation has been partially fulfilled.

- Recommendation: *Carry out a comprehensive study together with the responsible authorities for nature to derive the quantitative and qualitative needs for protected habitats and species, translated into specific objectives for each protected area which should be inserted in the RBMPs. Appropriate monitoring and measures should also be included in the RBMPs.*

  For Protected Areas designated under the Birds and Habitats Directives, it is reported for a few RBD, that specific objectives have been set - but in some cases the needs are unknown. For the majority of the RBDs, it is reported, that either the objectives for the WFD are sufficient to reach the objective for the particular parent Directive or that the needs are not known. There is no evidence therefore of a comprehensive study to define additional objectives and to implement appropriate monitoring and measures. This recommendation has been partially fulfilled.

Topic 16 Adaptation to drought and climate change

16.1 Assessment of implementation and compliance with WFD requirements in the second cycle and main changes since the first cycle

Even though there is no legal obligation to prepare Drought Management Plans, many Member States have prepared them in order to cope with droughts. Drought is a relevant issue for all RBDs in Spain. However, so far none of the RBMPs have applied any exemption under Article 4(6) for prolonged droughts (except Guadiana in the RBMP, but not according to WISE). According to the reporting by Spain, no sub-plans are in place on water scarcity and droughts. It should be noted however, that Spain has updated 11 of the 2006-2007 drought management plans[103]. The updated drought management plans consider combined indicators which could lead to a more frequent application of Article 4(6). Practical implications of their implementation are yet to be assessed.

Climate change was considered in various ways in all RBDs and it is stated that the guidance on how to adapt to climate change (Guidance Document No. 24) was used. Climate change has been considered in all basins in the following aspects: when setting objectives, selecting robust adaptation measures, monitoring change at reference sites and when assessing direct and indirect climate pressures. Climate change is also considered in flood risk and drought management and for water scarcity. Detecting climate change signals is another aspect considered. The RBMP Guadiana reports climate change as driver for applying Article 4(4) exemptions but no RBMP reports climate change as driver for applying Article 4(5) exemptions. KTM24 (climate change adaptation measures) is not made operational to address significant pressures in any of the RBDs. No specific sub-plans addressing climate change have been reported in any of the RBDs but as in the first cycle there is a national strategy for adaptation to climate change[104], with specific references to water management.

16.2 Progress with Commission recommendations

There were no recommendations relating to this topic.

[103] https://www.boe.es/diario_boe/txt.php?id=BOE-A-2018-17752.

[104] http://www.mapama.gob.es/gl/cambio-climatico/temas/impactos-vulnerabilidad-y-adaptacion/plan-nacional-adaptacion-cambio-climatico/