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Second River Basin Management Plans - Member State: Italy

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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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
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 (MS) 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

Italy (Map A) has a population of 60 million and a total surface area greater than 300 000 km^2. A large proportion of the territory is upland or mountainous: in mainland Italy, the Alps spread as an arc across the northernmost part of the country, while the Apennines stretch through the centre of the country. Most of the population lives in lowland areas, which as a result have a high population density.

Map A ***Map of River Basin Districts***



Source: WISE, Eurostat (country borders)

International River Basin Districts (within European Union and Switzerland)

International River Basin Districts (outside European Union)

National River Basin Districts (within European Union)

Countries (outside European Union)

Coastal Waters

Italy has eight River Basin Districts (RBDs) (Table A). The largest, the Padan, is 74 000 km^2 and covers almost 1-quarter of the country's territory. Six RBDs cover mainland Italy, while one each covers Italy's two large islands, Sardinia and Sicily.

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

Table A Overview of Italy's River Basin Districts

RBD	Name	Size (km^2)	Countries sharing RBD
ITA	Eastern Alps	38 187	AT, CH, SI
ITB	Padan	70 274 (71 057)	CH, FR
ITC	North Apennines	40 099 (38 131)	FR
ITD	Serchio	16 29	-
ITE	Central Apennines	37 616	-
ITF	South Apennines	71 037	-
ITG	Sardinia	30 265	-
ITH	Sicily	28 036	-

Source: River Basin Management Plans reported to WISE

Italy subsequently clarified that there was an error in the reported information (corrected values in brackets)

Three Italian RBDs share catchments with other Member States, and two with Switzerland:

- The Eastern Alps RBD shares catchments with Slovenia and small catchments with Austria and Switzerland;
- The Padan RBD shares catchments with Switzerland and a small catchment with France;
- The North Apennines RBD shares catchments with France.

Table B provides information for several key shared catchments (note that the data for the Danube refers to Italy's share of the whole international RBD; for the others, data refers specifically to the catchment).

Table B Transboundary river basins by category and % share in Italy

Name international river basin	National RBD	Countries sharing RBD	Coordination category					
			1		2		4	
			km²	%	km²	%	km²	%
Danube	ITA	AL, AT, BA,BG, CH, CZ, DE, HR, HU, IT, MN, ME, MK, PL, RO, RS, SL, SK, UA	565 (613)	<0.1				
Rhine	ITB	AT, BE, CH, DE, FR, IT, LI, LU, NL	60 (52)	<0.1				
Po	ITB	CH, FR			70 153 (70274)	94.8		
Ticino/Lago Maggiore (Sub--basin Po)	ITB	CH			3 229 (3270)	48.9 (no value)		
Adda/Lake Como (Sub--basin Po)	ITB	CH			7 448 (437)	94.0 (no value)		
(Dora riparia) (Sub basin Po)	ITB	FR			(144)			
Isonzo/Soca	ITA	SI			1 133 (1072)	33.3 (31,7)		
Adige/Etsch	ITA	CH			(67)	(10)	(12049)	(98.9)
Roia	ITC	FR			(67)	(10)		

Source: WISE electronic reporting

Italy subsequently clarified that there was an error in the reported information (corrected values in brackets)

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

Status of second river basin management plan reporting

A total of eight RBMPs of Italy (Eastern Alps, Padan, North Apennines, Serchio, Central Apennines, South Apennines, Sardinia, Sicily) were published between 17 December 2015 and 29 June 2016. Documents are available from the European Environment Agency EIONET Central Data Repository https://cdr.eionet.europa.eu/.

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

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

- **Governance and public consultation**

  - Italy has taken steps to strengthen the role of the RBD authorities and improve coordination among regions within each RBD, setting a more clear hierarchy between RBMPs and regional plans. Italy has strengthened international coordination, notably on cross-border catchments with Slovenia and France, although further steps could be taken.

  - The reporting of sub-plans does not appear to be consistent across Italy's RBDs.

  - Italy did not adopt and publish the RBMPs in accordance with the timetable in the Water Framework Directive.

  - Several of the national types for Italy in all of the RBDs do not appear to have corresponding intercalibration types. It is unclear how the intercalibration process has been translated to these national types[1].

  - For the majority of types, type specific reference conditions have not been established for physicochemical or hydromorphological quality elements.

  - The characterisation of groundwater bodies was not complete for some RBDs (as stated in Annex 0). Information on the linkages of groundwaters with surface water and terrestrial ecosystems is missing for several RBDs, although Italy stated that work is underway to improve this.

  - A number of significant pressures were not assessed for surface waters and groundwaters. The reasons for this were unclear from the RBMPs.

  - The North Apennines RBD and Sicily RBD reported to WISE that the definition of significance of pressures was not linked to the potential failure of objectives for surface waters. Similarly, for groundwater the North Apennines RBD and the Serchio RBD reported to WISE that the definition of significance of pressures was not linked to the

[1] Italy subsequently clarified that Italian legislation defined broad types (intercalibration macro-types) which are homogenous from the abiotic and ecological point of view. Such broad types are identified within the intercalibration exercises run between 2005 and 2017 and they comprise all national types. Italy believes that this approach guarantees that intercalibration results are extended to all national types.

potential failure of objectives. In addition, the tools for defining significant pressures varied between RBDs and were not adequately described in all RBMPs.

- Priority Substances and other substances causing the failure of good chemical status were reported for five of the eight RBDs. However the gaps have not been identified to tackle these substances to achieve good status by 2021 (or 2027), indicating the pressures not having been adequately apportioned.

- Italy reported inventories of emissions for five of the eight RBDs. The number of substances included ranged from 10 to 41. Tier 1 of the methodology was used for several of the substances deemed relevant at RBD level, which does not follow the recommendation of the CIS Guidance Document n°28. The data quality was variable, from uncertain to medium, or was not reported.

- **Characterisation of the RBD**

- For the majority of types, type specific reference conditions have not been established for physicochemical or hydromorphological quality elements[2].

- The characterisation of groundwater bodies was not complete for some RBDs (as stated in Annex 0).

- There was an improvement in the assessment of pressures since the first RBMPs, but a number of significant pressures were not assessed for surface waters and groundwaters. In some cases, the reasons for this were unclear from the RBMPs.

- The Sicily RBD reported to WISE that the definition of significance of pressures was not linked to the potential failure of objectives for surface waters. In addition, the tools for defining significant pressures varied between RBDs and were not adequately described in some RBMPs.

- Priority Substances and other substances causing the failure of good chemical status were reported for all eight RBDs. However the gaps have not been identified to tackle these substances to achieve good status by 2021 (or 2027).

- In the RBMPs, Italy reported inventories of emissions for five of the eight RBDs[3]. The number of substances included ranged from 10 to 41. Tier 1 and Tier 2 of the

[2] Italy subsequently clarified that for river types type-specific reference conditions for hydromorphological quality elements have been established.

methodology were used for several of the substances deemed relevant at RBD level. The data quality was variable, from uncertain to medium, or was not reported.

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

  - In the six RBDs for which information is available for both the first and second RBMPs, there were significant increases in the number of monitoring sites in all water categories, even if some gaps remain in several RBDs.

  - The required biological quality elements are generally monitored in rivers but not all of them are monitored in lakes, transitional and coastal waters.

  - There are significant gaps in the monitoring of hydromorphological quality elements.

  - All the relevant general physicochemical quality elements were monitored in coastal waters in most RBDs but there are gaps in the monitoring of lakes, rivers and coastal waters in some RBDs.

  - All biological quality elements used for surveillance monitoring were sampled at least at the minimum recommended frequency at all sites. However, for operational monitoring this is the case for only two of the seven biological quality elements used.

  - At least 289 different River Basin Specific Pollutants were reported to be monitored in Italy. However, there are issues relating to the reporting of this information to WISE and it is unclear what the exact number is.

  - Biological quality element methods have been developed, for the second RBMPs, for all relevant biological quality elements in all water categories, with the exceptions of fish in transitional waters and phytobenthos in lakes.

  - The classification boundaries for all hydromorphological quality elements and physicochemical quality elements in all water categories were not related to the class boundaries for the sensitive biological quality elements[4].

[3] Italy subsequently explained that the remaining inventories, even if not reported in the RBMPs, were prepared and submitted through Reportnet where they were uploaded in an envelope under the reporting of the 1st RBMPs.

[4] Italy subsequently clarified that it is currently checking the consistency between the physico-chemical quality element standards (LIMeco, LTLeco, TRIX) in relation to good-moderate boundaries for sensitive biological quality elements for lakes rivers costal and transitional water following the indications from the draft CIS guidance "*Best practice for establishing nutrient concentrations to support good ecological status*".

- Environmental Quality Standards were reported for at least 110 River Basin Specific Pollutants, including 27 substances in sediment and 89 in water. However, not all Standards have been derived in accordance with the Technical Guidance no. 27.

- There was an increase in the proportion of surface water bodies at good or better ecological status/potential, from 25 % in the first RBMPs to 42 % in the second. At the same time, there was a significant reduction in the proportion of surface water bodies with unknown status/potential, from 56 % to 18 %.

- The confidence in the classification of ecological status/potential has improved due to increased monitoring and assessment of biological quality elements.

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

- Approximately two thirds of all lake monitoring sites have been used for monitoring chemical status and just under half of river and transitional water monitoring sites are used. Of the coastal monitoring sites, 41 % were monitored for chemical status. Over two thirds of transitional water bodies were monitored for chemical status. Territorial waters are not monitored and assessed for chemical status under the WFD. Italy mentioned that their status has been assessed under the MSFD, but it is unclear whether this assessment was based on the same criteria as the ones required for the WFD.

- 59 % of water bodies failing to achieve good chemical status were reported to be monitored as part of the operational programme in Italy as a whole. A quarter of river water bodies, around a third of coastal water bodies and a less than half of lake water bodies were monitored for chemical status.

- For status assessment, monitoring was reported for more than 3241 Priority Substances at a site level across the RBDs. A higher proportion (up to 100 %) of coastal and transitional waters was monitored for more than 10 Priority Substances than for lakes and rivers (up to 70 %). Monitoring frequencies in water meet the minimum recommended frequency in the Directive at some sites but not in others. Italy has indicated that reduces frequencies are justified according to the European and national legislation however no detailed explanation was provided. Mercury, hexachlorobenzene and hexachlorobutadiene were monitored in biota for status assessment in four RBDs. Monitoring frequencies in biota meet the recommended minimum frequency of the Directive in each site monitored.

- For trend assessment, arrangements are reported to be in place in two RBDs but not in three RBDs. Italy monitors up to 10 of the 14 Priority Substances for trend assessment in sediment and/or biota in four of the eight RBDs. Each of the 10 substances is monitored at some monitoring sites in coastal and transitional waters across all RBDs monitored. Almost all sites for trend assessment were monitored at a frequency of at least once every three years which meets the minimum requirements of the Directive.

- In five of the eight RBDs in Italy, almost all of the Priority Substances discharged into the RBDs are monitored. For the remainder, while inventories have been produced and submitted to the Commission through Reportnet, they have not all been reported in the RBMPs and therefore in performing the current assessment it was not always possible to identify which substances are discharged into the RBDs and compare with the list of monitored priority substances.

- For Italy in general, between the two cycles there was a large increase in the proportion of surface water bodies with good chemical status from 18 % to 72 % and an increase in the proportion with poor status from 4.8 % to 8.5 %. The proportion with unknown status has reduced significantly from 78 % to 20 %.

- 25 % of surface water bodies in Italy were classified for chemical status with high confidence, 29 % with medium confidence and 46 % with low confidence.

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

- Overall, half of all groundwater bodies are not monitored for quantitative status. Yet, there are considerable differences in the monitoring coverage of quantitative status of groundwater bodies at river basin district level (coverage ranging between 18 and 96 %).

- Approximately 25 % of all groundwater bodies have no clear status with differences amongst the different river basin districts.

- Relevant environmental objectives for surface waters and groundwater dependent terrestrial ecosystems have only partially been considered in all river basin districts but measures are included in the river basin management plans to improve the knowledge base.

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

  - Around 50 % of groundwater bodies are not subject to surveillance monitoring, with considerable variations between RBDs. Not all groundwater bodies at risk were subject to operational monitoring and not all substances causing risk were monitored. Threshold values are not established for all substances causing risk in all RBDs.

  - The number of groundwater bodies with unclear status has declined (from 263 to 183 groundwater bodies) although a significant proportion of groundwater bodies have no clear status and the confidence in status results is low or unknown (with range variations among districts and regions).

  - The number of groundwater bodies failing good chemical status and the related groundwater body area has increased (from 23 % to 25 % in terms of number of groundwater bodies). However, the number of groundwater bodies taken into consideration differs from first and second cycle reporting.

  - Groundwater dependent ecosystems were considered in status assessment where they were related to risk. Groundwater associated surface waters were not considered in status assessment in some river basin districts where they were related to risk.

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

  - Progress has been made since the first RBMPs in developing the methodology for designating heavily modified water bodies and artificial water bodies. A common national methodology has been in place since 2013. In some RBDs, however, implementation of the methodology for heavily modified water body designation remains ongoing and the designations are preliminary. According to information provided by Italy, the evaluation of significant adverse effects and better environmental options for designation of heavily modified water bodies is currently being carried out.

  - A national methodology for good ecological potential has not been included in the second RBMPs. According to information provided by Italy, a national methodology for good ecological potential has been developed and approved with a Decree of 2016.

Environmental objectives and exemptions

- Environmental objectives for ecological and chemical status of surface water bodies were reported in all RBDs as well as for chemical and quantitative status of groundwater bodies. Information is also provided on when it is expected that the objectives will be achieved.

- Drivers, pressures and pollutants leading to exemptions are reported. Also impacts leading to exemptions are reported.

- Overall the number of exemptions under Article 4(4) has significantly increased in all RBDs.

- The RBMP for the Padan RBD, which was assessed in more detail, provided a list of water bodies and the indication of when they were expected to reach good status. For some water bodies expected to reach good status in 2021 or 2027 also Article 4(5) was applied, which requires detailed assessments as Article 4(5) allows for lower objectives than good status.

- The level of information provided behind the justification of exemptions varies a) depending on the reason, and b) depending on the different RBDs.

- Italy did not report the application of exemptions under Article 4(7) in the second RBMPs. However, from the information reported and assessed it appears that the impacts on the status of planned new modifications have not been assessed in full detail and the requirements set out by Article 4(7) have not been fully followed.

- **Programme of Measures**

- Progress has been made by identifying significant pressures and defining KTMs in all RBDs except Sicily, and carrying out gap analyses in four of the eight RBDs.

- The level of implementation of the measures set in the first RBMPs has been limited to full application of only some measures. Notably the governance aspects are reported as an obstacle in seven RBDs in the second cycle. A new law, adopted in December 2015, reformed the institutional structure of the river basin authorities in order to address these problems.

- No clear overall financial commitment has been secured for the implementation of the second Programme of Measures for all of the RBDs.

- New legislation or regulations to implement the Programme of Measures in the first RBMPs was reported necessary and was reported as already being adopted in the Eastern Alps, Northern Appenines and Serchio RBDs and in progress in the Padan, Central Apennines and Southern Apennines RBDs. There was no information for the Sicily RBD.

- For surface water, KTMs were reported for all significant pressure types causing failure of objectives reported in all RBD. For groundwater, KTMs were reported for all significant pressure types causing failure of objectives in the Eastern Alps, Padan, Serchio, Northern Appennines, Southern Appennines, Sicily and Sardinia RBDs.

- KTMs have been mapped against River Basin Specific Pollutants and substances, respectively in surface water and groundwater, for two RBDs[5] only (the Eastern Alps, and Central Appennines)

- Similarly, KTMs have been mapped against priority substances in surface water for three RBDs[6] only (the Eastern Alps, Central Appennines and Southern Appennines), whilst the number of water bodies failing objectives due to priority substances in surface water has been reported for the same RBDs plus Sardinia.

- A large number of national basic and supplementary measures have been mapped against a wide range of KTMs. Many of the measures apply in all RBDs.

- In terms of indicators of the gaps to be filled by Key Types of Measure and indicators for the scale and progress with implementation of measures until 2027, significant progress has been made in four of the eight RBDs, the Eastern Alps, Central Apennines, Southern Apennines and Sardinia. No progress has been made in the other four RBDs.

- The RBMPs and Floods Directive and Flood Risk Management Plans have been coordinated in all RBDs.

[5] Italy subsequently clarified that KTMs have been mapped against RBSP for all RBDs. However, this is not reported in WISE.

[6] Italy subsequently clarified that KTMs have been mapped against priority substances in surface water for all RBDs. However, this is not reported in WISE.

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

  - Water abstraction pressures were reported as relevant for several river basin districts. The Water Exploitation Index + is calculated in all river basin districts, showing water stress for instance in Padan, North Apennines, and Sicily.

  - Data were reported for the uses of water consumption but are in general based on estimates, surveys, assimilated from statistics, or from other undefined or not described methods.

  - There is a concession, authorisation and/or permitting regime in place to control surface and groundwater abstractions and water impoundment in all river basin districts.

  - Nearly all river basin management plans include a water resource allocation and management plan.

  - Italy has put in place a national policy framework to extend metering to irrigation; implementation on the ground has recently started, according to the information provided by Italy.

  - Funding sources and budgets for specific measures are not outlined in all the RBMPs, and the overview figures for addressing abstraction control and concessional appear to be relatively low.

- **Measures related to pollution from agriculture**

  - There is a clear link between agricultural pressures and agricultural measures.

  - A gap assessment for pressure reductions for nutrients was reported only in the Southern Apennines RBD.

  - Safeguard measures for drinking water have been established.

  - Financing of measures is secured in all RBDs except the North Apennines RBD where financing has not been reported as secured.

  - It is not clear from the assessed RBMP what part mandatory or voluntary measures will play in achieving the WFD objectives, although some regions do state this.

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

  - A large range of KTMs relevant to non-agricultural sources of pressures causing failure of WFD objectives were reported for Italy. However, for several of the RBDs, these were not linked in WISE to specific substances causing failure.

  - A register of wastewater discharges was available in seven out of eight RBDs for surface and groundwater. No such register was reported in the Sicily RBD.

  - Information available in the RBMPs reviewed showed that the measures described there were generally not explicitly linked to individual substances causing failure.

  - Measures are planned to better control discharges from urban wastewater treatment plants, some RBMP but not all contain an assessment of the anticipated impact of the measures.

- **Measures related to hydromorphology**

  - In the first RBMPs, few water bodies were reported as being subject to significant hydromorphological pressures. In the second RBMPs, as the effect of a more rigorous analysis of pressures, the share of surface water bodies reported as affected by significant hydromorphological pressures has significantly increased. In general, the significant hydromorphological pressures are assigned to specific sectors with few exceptions. Operational KTMs to tackle significant hydromorphological pressures were reported for all RBDs.

  - In six out of eight RBDs, ecological flows have not yet been derived. However, in the majority of RBDs, there are plans to do so before the third RBMPs. According to information subsequently provided by Italy, new Directives for calculating the ecological flow have been approved in the end of 2017 in the continental RBDs, which will entail the transition from minimum vital flows to e-flows, in accordance with the CIS Guidance number 31. This should be reflected in the third RBMPs.

  - Natural water retention measures are clearly planned in some RBDs and the RBMPs of further RBDs may include references to green infrastructure and natural water retention measures. There is also evidence that priority is given to the use of natural water retention measures and green infrastructure measures in the planning process, at least in some RBDs.

- **Economic analysis and water pricing policies**

  - RBDs have applied the provisions of Ministerial Decree 39/2015 and have carried out an analysis of services and uses that exert significant pressures on water resources; this implies that services and uses taken into consideration in each RBD may differ.

  - It is not clearly explained in some RBMPs if the cost recovery rates per water service are disaggregated to contributions from different water users.

  - A methodology for calculation of environmental and resource costs is given at national level.

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

  - Objectives have generally been developed for Protected Areas on a site by site basis rather than using a broad generic approach.

  - For some most of the protected nature areas, the additional measures required to meet specific objectives are not known.

  - The monitoring of protected areas show some gaps. Some of these gaps may appear due to errors in the WISE reporting.

- **Adaptation to drought and climate change**

  - Climate change was considered in all RBDs and the Common Implementation Strategy guidance document on how to adapt to climate change was used in most of them.

  - Drought management plans were reported for Italy for the Eastern Alps, Padan, North Apennines, Serchio, Central Apennines and Sardinia RBDs. According to the information provided by Italy, "Permanent Observatories on water uses" at district level have been set up in 2016 in the country, whose role has not been specified.

  - No such plan was reported for the Sicily RBD in spite of the relevance of drought acknowledged in the 2012 Topic report.

Recommendations

- The preparation of the next RBMPs should be carried out in accordance with the WFD timetable, to ensure the third RBMPs are adopted timely.

- Italy should include clear information in national RBMPs on international coordination efforts in order to increase transparency.

- Italy 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.

- Italy has made good progress in the delineation of water bodies and in the definition of significant pressures. However, further work is still needed to harmonise different regional approaches, in particular for the definition of the significance of pressures.

- Italy should continue to improve monitoring of surface waters by covering all relevant quality elements in all water categories. Hydromorphological quality elements should be monitored at a sufficient number of sites for a reliable assessment of status/potential. The monitoring of physicochemical quality elements should also be strengthened to fill the remaining gaps.

- Italy should continue the efforts for improving the method for the selection of River Basin Specific Pollutants and ensure that Environmental Quality Standards meet the minimum requirements for the protection of freshwater and marine ecosystems from possible adverse effects, as well as of human health.

- Italy should complete a comprehensive gap assessment for diffuse pollutant loads from agriculture (nutrients, agri-chemicals, sediment, organic matter) across all waters in all RBDs and link it directly to mitigation measures in the third RBMPs (as per WFD Article 11(3)(h)), to facilitate the achievement of WFD objectives.

- Italy should base the classification of water bodies on complete assessment methods, including all biological quality elements. The classification boundaries of hydromorphological quality elements should be related to the classification boundaries for the sensitive biological quality elements, and all the relevant physicochemical quality elements should be used in the assessment of ecological status/potential.

- The monitoring for status assessment should continue to be improved to reach sufficient confidence and spatial coverage for all the Priority Substances (including territorial waters whose status should be also be reported in the RBMPs) and the proportion of unknown status further reduced.

- Trend monitoring should be performed in all RBDs, for all substances, in a way that provides sufficient temporal resolution and spatial coverage.

- The high percentage of groundwater bodies in unknown status (especially in some RBDs) prevents effective planning and comparability with other Member States. Italy should implement methods for the quantitative and chemical status assessment of groundwater bodies.

- Additional efforts are needed to take into account quantitative aspects for groundwater during monitoring and assessment phases, especially in some RBD

- Efforts need to be continued for the designation of heavily modified water bodies by implementing a WFD compliant methodology in all RBDs. All the requirements of Article 4(3) need to be complied with, including the assessment of significant adverse effects on their use or the wider environment and the lack of significantly better environmental options. This is needed to ensure transparency of the designation process. Ecological potential needs to be defined and applied in all RBDs.

- Progress needs to be continued to further reduce uncertainties regarding the timeframe for the achievement of the WFD objectives. The significant number and increase of the application of Article 4(4) and 4(5) exemptions is an issue of concern. Italy needs to take all possible measures in order to ensure the timely achievement of the WFD objectives. The application of exemptions needs to be reviewed in a more transparent manner and the reasons for the exemptions and detailed results of the related assessments need to be clearly demonstrated in the RBMPs, in particular in relation to technical infeasibility and disproportionate costs. The individual logic, related justifications and criteria for Article 4(4) and 4(5) exemptions need to be clearly distinguished.

- Italy needs to ensure WFD compliance in relation to the application and reporting of Article 4(7). An ex-ante evaluation of the expected effects of a proposed new project on water body status / potential at quality element level is required in line with the requirements of the WFD and as further specified by the Judgment of the Court in case C-461/13. In case deterioration / non-achievement of good status/potential can be

expected, the project can only be authorised in case all the requirements of Article 4(7) are met.

- Clear links between pressures identified and measures to be taken should be established for all RBDs.

- Italy should provide cost-effectiveness analysis and improve information on cost of measures for the Sicily RBD.

- Meaningful information regarding the scope and the timing of the measures should be clearly shown in the Programme of Measures so the approach to achieving the objectives is clear and the ambition in the Programme of Measures is more transparent. In addition, the RBMPs should provide information on a systematic prioritisation of measures.

- Gap analyses should be comprehensive and gap indicators linked to the status of water bodies.

- Italy should ensure that information on funding sources of the Programme of Measures is more clearly described in the third RBMPs.

- Italy should continue reinforcing metering for all abstractions, and reviewing abstraction permits systems. It should ensure that action is taken to address illegal abstractions especially in RBDs with relevant water scarcity problems (e.g. Sicily).

- Italy should continue to review and develop the strategy for the delivery of WFD objectives, in cooperation with the farming community and Italian CAP delivery authorities, to ensure the third RBMP is technically feasible and that all relevant policies and instruments (e.g. RDP, CAP Pillar 1, Nitrates Directive etc.) contribute significantly to RBMPs.

- In the third RBMPs, it should be stated clearly for all RBDs 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. Sources of funding should be identified (e.g. CAP Pillar 1, RDP), as appropriate.

- Italy should ensure that KTMs are reported for all significant pressures causing failure of objectives, in all RBDs. In particular, all Priority Substances and River Specific Pollutants identified as causing failure should be associated with KTMs, to clearly show whether the measures are sufficient to reach the objectives of the WFD (both the

objectives of reaching good status, but also the objective to suppress emissions for priority hazardous substances).

- Italy should continue their efforts to tackle urban waste water discharges, and make sure that the measures planned are sufficient to meet the WFD objectives (as well as the UWWTD) in all RBDs.

- Italy should ensure that the necessary measures to tackle hydromorphological pressures are included in the Programmes of Measure and properly implemented in all RBDs. Furthermore, Italy needs to complete the transition from the minimum vital flows to ecological flows.

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

- Additional measures to reach additional objectives for Protected Areas have been identified and included within the PoM. Italy should further work to include all Protected Areas where measures have not been identified yet.

- Italy should ensure that a drought management plan is adopted also for the Sicily RBD, especially in light of the fact that abstraction is identified as a significant pressure on groundwater bodies.

Topic 1 Governance and public participation

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

Only three of Italy's eight RBMPs were published in December 2015 as per the schedule required under the WFD. The RBMPs for the North Apennines, Central Apennines and South Apennines RBDs were published on this date. The RBMPs for the Eastern Alps, Padan, Sericho and Sardinia RBDs were published in March 2016, and the RBMP for Sicily RBD was published in June 2016.

1.1.1 Administrative arrangements – river basin districts

Italy designated eight RBDs. Of these, Italy reported that the Eastern Alps RBD and Padan RBD and the Northern Apennines are part of international RBDs. Italy shares catchments in the Eastern Alps RBD with Austria, Switzerland and Slovenia. Italy shares catchments in the Padan RBD with France and Switzerland. In addition, Italy shares a small catchment in the Northern Apennines RBD with France: the Roja or Roya River. This, however, is not acknowledged in Italy's reporting.

In late 2015, Italy has approved the Governance reform (Law 221/2015) establishing seven RBDs Among its provisions, this law incorporated the small Serchio RBD, into the North Apennines RBD. Consequently, Italy now has seven RBDs (this change occurred in 2017, when a 2016 decree by the Ministry of Environment was published on the Official Journal n. 27 February second, 2017). Italy has informed that Art. 64 details the new delimitation of the boundaries of each River Basin District with identification of the river basins which are part of the new RBDs.

1.1.2 Administrative arrangements – competent authorities

Italy has identified (in the second cycle when the River Basin District Authorities' reform had not been completed) competent Authorities at national, river catchment and regional levels.

At national level, the Ministry of Environment has main roles for the coordination of implementation and reporting to the European Commission, and a secondary role for the implementation of measures. The national Institute for Environmental Protection and Research (ISPRA) has a main role for WISE reporting to the European Commission.

Italy lists seven river basin authorities. It can be noted that only two of these correspond to RBDs (Padan and Serchio): the five others were authorities for major rivers within their RBDs,

and (as noted in the 2012 assessment), were provisional authorities for their respective RBDs. These authorities had main roles for pressure and impact analysis, economic analysis, preparation of RBMPs and Programme of Measures, public participation, implementation of measures and reporting to the European Commission.

Italy lists 19 regions and two autonomous provinces (Bolzano and Trento) as authorities. The regions and autonomous provinces are in accordance with the WISE reporting responsible for monitoring and assessment of groundwater and surface water, pressure and impact analysis, economic analysis, enforcement of regulations, preparation of RBMPs and Programme of Measures, public participation, implementation of measures, and reporting to the European Commission. Two regions – Sardinia and Sicily – are also RBD authorities.[7]

1.1.3 River Basin Management plans – structure and Strategic Environmental Assessment

Italy's RBMPs have sub-plans. For Padan RBD, the sub-plans cover: agriculture, chemical industry, chemical pollution, hydropower, nutrient enrichment, urban planning, water scarcity and droughts and water balances.

For the Northern Apennines RBD, sub-plans cover climate change, rural planning and water scarcity and droughts. The Water Protection Plan (*Piano di Tutela delle Acque*) for the region of Liguria is also listed as a sub-plan.

For the Central Apennines RBD, sub-plans cover agriculture, the chemical industry, chemical pollution, coastal erosion, hydropower, nutrient enrichment, rural planning, transport, urban planning and water scarcity and droughts.

Sub-plans (water protection plans, water balance plans, rural development plans) are part of each RBMP. For example the review of Programme of Measures shows many measures are shared with Italy's Rural Development Programmes (RDPs). This appears to be the case across the whole country.

Italy reported to WISE that Strategic Environmental Assessments were carried out for five of Italy's eight RBMPs[8].

[7] The competences of the River Basin District Authorities and the regions are defined by Legislative Decree 152/2006 and Legislative Decree 219/2010.

[8] Italy subsequently clarified that for the Padan RBMP, a Strategic Environmental Assessment was carried out, while for the other 7 RBDs, a Strategic Environmental Assessment screening was carried out that led to an opinion not to prepare a Strategic Environmental Assessment.

1.1.4 Public consultation

The mechanisms to inform the public and interested parties varied across Italy's eight RBDs.

In all of Italy's RBDs, the public and interested parties were informed by direct mailing and internet. Invitations to stakeholders were made in all RBDs but the Eastern Alps RBD. The public and interested parties were informed by meetings in all RBDs except Sardinia. Local authorities provided information in five RBDs; media (such as papers, television or radio) were used in three RBDs (Serchio, Central Apennines and South Apennines); printed material in two (Padan and Central Apennines); and social networks (for example, Twitter, Facebook) in one RBD (North). Documents were available for download in all RBDs; in addition, direct mailing (via email) was carried out in four RBDs (Padan, the Central Apennines, Sardinia and Sicily), paper copies were available at local authorities in municipal buildings in two RBDs (South Apennines and Sardinia), paper copies were distributed at exhibitions in the Central Apennines RBD, and were available at the RBD authority in the Eastern Alps. Across all of Italy's RBDs, documents were available for the requisite six months.

The stakeholder groups actively involved in the development of the RBMPs as well as the mechanisms for their involvement also varied across the RBDs.

The stakeholder groups actively involved in the development of the RBMPs were as follows: agriculture/farmers, energy/hydropower, industry, local/regional authorities and water supply and sanitation (in all RBDs); NGOs/nature protection (in all RBDs but Sicily); consumer groups (in all RBDs but Padan, the North Apennines and Serchio); universities and research centres (in the Eastern Alps, Padan, Central Apennines and South Apennines RBDs); fisheries/aquaculture (in Eastern Alps, Padan and Sardinia RBDs only); and navigations/ports (in Eastern Alps, Padan and Sardinia RBDs only). Professional associations were actively involved in the Padan and Sardinia RBDs, while expert associations were reported for the Central Apennines RBD. The Sardinia RBD also reported that scientific associations were actively involved. The Eastern Alps RBD reported that the consorzi di bonifica (bodies in charge of irrigation) were actively involved, and the Central Apennines RBD cites "territorial contracts" ("contratti territoriali") that bring together interest groups. The South Apennines RBD also reports as stakeholder groups the national Ministry of Cultural Heritage and Activities and Tourism, the Ministry of Infrastructure and Transport, and the Ministry of Agricultural, Food and Forest Policies.

The mechanisms for active involvement of stakeholders were: establishment of advisory groups in three RBDs (Eastern Alps, Padan and Central Apennines involvement of drafting in three RBDs (Eastern Alps, Padan and Sardinia); regular exhibitions in three RBDs (Eastern

Alps, Central Apennines and South Apennines); and formation of alliances in three RBDs (Padan, South Apennines and Sicily). In addition, the Eastern Alps RBD refers to coordination with the consultation on the Water Protection Plan under preparation in the Friuli Venezia Giulia Region and also to a SWOT analysis as other forms of outreach. In the North Apennines RBD, updated information on the plan was sent to stakeholders, which were directly involved in conferences on the presentation of the plan. The Serchio RBD refers to meetings. In the Central Apennines RBD, a web instrument was activated after each regional meeting with interest groups. For Sardinia RBD, there were direct invitations and the establishment of a public relations office. For Sicily RBD, a blog was reported as a mechanism for ongoing stakeholder involvement.

For all of Italy's RBMPs, public consultation led to the addition of new information. Public consultation led to adjustments to specific measures in five RBMPs (Eastern Alps, Padan, Serchio, Central Apennines and the South Apennines RBDs). There were changes to the selection of measures in five RBMPs (Eastern Alps, Padan, South Apennines, Sardinia and Sicily). In four RBMPs, there was a commitment to further research (Eastern Alps, Padan, Sardinia and Sicily). In four RBMPs, there was a commitment to action in the next RBMP cycle (Padan, North Apennines, Serchio and South Apennines). In the Central Apennines RBD, a further impact was the integration of the RBMP into territorial contracts underway.

1.1.5 Integration with the Floods Directive and the Marine Strategy Framework Directive

Italy has reported to WISE that one of its eight RBMPs (North Apennines) is integrated with the relevant Floods Directive[9] Flood Risk Management Plan into a single plan. In seven of eight RBDs, there was joint consultation of the RBMP and Flood Risk Management Plan (no information was found for Sicily RBD).

For two RBDs (the Eastern Alps and Padan), reporting on integration with the Marine Strategy Framework Directive[10] refers to the Programme of Measures of the RBMPs, suggesting that measures were coordinated. Nonetheless, none of Italy's RBMPs organised joint consultation with the Marine Strategy Framework Directive.

[9] 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

[10] 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

1.1.6 International coordination

Italy has reported that the two international RBDs, Eastern Alps and Padan, have an international agreement and a permanent cooperation body in place (designated as category 2 cooperation).

As indicated in the 2012 Commission Staff Working Document, the Eastern Alps RBD shares the Isonzo/Soča catchment with Slovenia, but also a section of the Etsch catchment (a tributary of the Adige river basin in Italy) is found in Switzerland and Italy has a small catchment that is part of the Danube International RBD (part of the Drava River basin and Slizza river basin). For the Padan RBD, Italy shares several catchments with Switzerland, a small catchment is found in France and Italy also has a small territory that is part of the Rhine International RBD; and cooperation varies across these catchments. A small catchment in the Northern Apennines RBD is shared with France.

Italy does not participate in any international river basin agreements[11], though Italy has bilateral agreements on water management with Slovenia and Switzerland.

The 1975 Treaty of Osimo between Italy and Yugoslavia set up what is now the Italian-Slovenian Commission for Water Management[12]. The Treaty, in place before the WFD, now provides the forum for cooperation between Italy and Slovenia on the WFD and Floods Directive[13], according to the RBMP for the Eastern Alps RBD. The Commission meets regularly (generally twice a year) to discuss implementation of the two Directives and of cooperation activities for water management. Its work covers the Isonzo/Soča catchment as well as smaller shared catchments. Among its activities, the Commission and expert groups working under it exchanged information about the development of the second RBMPs, cooperated on monitoring and developed transboundary projects to support implementation of the WFD and Flood Directive.

The agreement between Switzerland and Italy concerning the protection of Italian-Swiss waters against pollution was concluded on 20 April 1972. With this agreement, the Swiss Federal Council and the Italian Government decided to work together to protect Italian-Swiss surface and groundwater from pollution.

[11] Italy was represented at the 2008 Drava River Vision Symposium in Maribor, Slovenia, which adopted the non-binding "Declaration concerning common approaches to water management, flood protection, hydropower utilisation and nature and biodiversity conservation in the Drava River Basin".

[12] Commissione Italo-Slovena sull'idroeconomia in Italian; Stalna slovensko-italijanska komisija za vodno gospodarstvo in Slovenian

[13] 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

No international commissions are in place between Italy and France for management of shared catchments. Nonetheless, for the Padan RBMP, as part of the Strategic Environmental Assessment, institutional representatives of France and of Swiss cantons have been consulted with regard to the cross-border portions of the RBD[14]. In addition, a small share of the Northern Apennines RBD is shared with France, the Roya/Roja River catchment (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

Since the adoption of the first RBMPs, the District Basin Authorities have undertaken actions to improve coordination among authorities within their District (see section 1.3 for further details). Moreover, Italy has strengthened international coordination, for example in the Isonzo/Soča River basin shared with Slovenia.

1.3 Progress with Commission recommendations

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

- Recommendation: *Improve coordination between regions and RBD authorities and improve reporting to make it more integrated at RBD level (it is essential to clarify the respective roles of the Regions and RBD authorities and give further detail on the integration and coordination of regions, RBD and the national level for reporting).*

- *Methods… [should be] effectively coordinated between the regions at the level of the RBD in order to achieve water management at the river basin level instead of management according to administrative boundaries.*

  Assessment: Italy reported to WISE that both RBD authorities and Italy's regions (plus the two autonomous provinces of Bolzano and Trento) have main roles for pressure and impact analysis, economic analysis, preparation of RBMPs and Programme of Measures, public participation, implementation of measures and reporting to the European Commission. Consequently, there was a need in the second cycle to ensure coordination between these two levels[15].

[14] Italy has subsequently informed that measures are also coordinated.

[15] Italy has informed that the coordination role is assigned to the RBD Authorities by Legislative Decree 219/2010 and that each RBD authority drafted the RBMP and carried out coordination activities accordingly.

National reforms in the institutional structure to establish permanent RBD authorities are expected to further strengthen coordination between regions and RBD authorities (this is described under the following recommendation).

In conclusion, in the period of the preparation of the second RBMPs, Italy took important steps to implement the Commission's recommendation. The implementation of this recommendation was partially fulfilled.

- Recommendation: *The transition of the RBD authorities from a provisional to a permanent system should be completed and it should be ensured that these cover the entire area of the relevant RBD.*

  Assessment: Italy's reporting to WISE indicates that the provisional system was still in place through the preparation of the RBMPs. For example, Italy reported the Tevere (Tiber) Basin Authority for the Central Apennines RBD: the Tevere Authority was the provisional authority for this RBD. Two "bridge laws" – Law 13 of 2009 and Legislative Decree 219/2010 – assigned to the existing basin authorities (such as the Tiber Basin Authority) a coordination role for the implementation of the WFD on the territory defined by Legislative Decree 152/2006 [i.e. within the RBDs]. Therefore, during the second cycle, the river basin authorities were coordinating the Regions belonging to the RBDs. Nonetheless, at the time of the preparation of the second RBMPs, the provisional system continued, though with a stronger legal basis.

  In December 2015, however, Law 221/2015 reformed the institutional structure of the basin authorities, establishing permanent authorities for each RBD (the Law also introduced some changes in RBD boundaries). A subsequent Ministerial Decree[16] in October 2016 and a Decree of the President of the Council of Ministers[17] provided the implementing legislation for the changes set out in Law 221/2015, thus establishing the permanent RBD authorities.

  The Commission's recommendation has therefore been fulfilled (however, the fulfilment of this recommendation occurred after the publication of the second RBMPs).

[16] DM 294 of 25 October 2016
[17] DPCM of 4 April 2018

Recommendation: *Many measures in the Programmes of Measures originate from other existing plans and no clear link between measures and status assessment is made.*

Assessment: This recommendation addresses several points (see chapter 9 for further assessment).

In the first RBMPs, many measures derived from other plans, in particular the regional water protection plans (Piani di tutela delle acque) . A review of the second RBMPs for Padan RBD and for the South Apennines RBD show that both refer frequently to information in and work under the regional Water Protection Plans (*Piani di tutela delle acque*). In the RBMP of the South Apennines RBD there is a chapter that lists all the regional programming documents (and their modifications) that are relevant for the governance of water resources as established by the WFD. Among these, the Water Protection Plans are indicated as being very important (they are closely linked/very relevant - "*strettamente correlati*"). Similarly, the RBMP for the Padan RBD refers to the regional Water Protection Plans as the main reference documents for the preparation of the RBMP and notes that the content of such regional plans and the RBMP overlaps in some instances. This RBMP states that the principle of vertical subsidiarity should be respected when implementing such plans. In order to increase the level of coordination between these two planning documents on 23 December 2013, the regions in the Padan RBD signed the document 'Guiding Act for the preparation of the Water Protection Plans' and the regional planning documents in coordination with the RBMP with the Management Plan of the river Po.

At the time of preparation of the RBMP, the regional Water Protection Plans were being updated in both the Padan RBD and the South Apennines RBD, although with different time frames depending on the regions. It particular, for the Padan RBD, Liguria and the Province of Trento updated their Water Protection Plans in parallel with the preparation of the RBMP, while the other regions started the review of their plans only after the adoption of the RBMP. Here, again, arises the problem regarding the coordination of the work of the different regions[18].

[18] Italy subsequently clarified that the timescale foreseen for the update of Water Protection Plans was revised under Law 221/2015, which established that Water Protection Plan are updated one year after the RBMPs (i.e. by 31.12.2016). This provision has its justification also in the fact that Water Protection Plans have to be coherent with the RBMPs. Before the approval of Law 221/2015, prior legislation set the review of Water Protection Plans by December 2015; some regions updated the Water Protection Plans in parallel with the activities carried out together with the River Basin Authorities for the update of the RBMPs. Other regions

As noted above, Italy passed Law 221/2015 in December 2015. In addition to the provisions noted above for RBD authorities, this law also addressed the links between RBMPs and Water Protection Plans. This law establishes a clearer hierarchy, indicating that the RBDs are the competent authorities and that regions have competence for the Water Protection Plans, which are sectoral plans that have to be drafted in coherence with the RBMP: the RBMPs are the overarching plans with respect to regional Water Protection Plans. To this end, each RBD Authority now has to release a formal opinion on the Water Protection Plans, for the regions in its territory.

Consequently, Italy has partially fulfilled this recommendation.

chose not to proceed to an overall update of their Water Protection Plan but to update only single topics to be approved by specific regional acts with the aim of reviewing only singular aspects of direct competence to be included in the RBMP and in the Water Protection Plans.

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, there was an increase in the number of water bodies between the first and second RBMPs (Table 2.1). There was a similar increase in lake water bodies and coastal water bodies of 16 % and 15 %, respectively. The most significant increase was for groundwater bodies of 24 % (Table 2.2). Sicily RBD did not report any groundwater bodies in the first RBMP and there were 82 in the second RBMP. For river water bodies however there was an overall decrease of about 2 % and a decrease of 4 % for transitional water bodies. Eight territorial water bodies were reported in the second RBMP and there were none in the first RBMP. The RBD with the most significant change in the number of water bodies was the South Apennines RBD with an average increase of 41 %. There was also a significant increase in the number of lake water bodies specifically in Sardinia RBD from 1 to 32 lake water bodies[19].

In the second RBMP, 78 % of identified surface water bodies were natural with 15 % being designated as heavily modified and 8 % as artificial water bodies. In the first RBMP, the situation was similar but the proportion of heavily modified water bodies (10 %) was slightly less overall (Figure 2.1). The RBMP for the Northern Apennines RBD noted that the technical criteria for the identification of artificial water bodies and heavily modified water bodies were published in November 2013 (Ministerial Decree n. 156 of 17 Nov. 2013) and entered into force in January 2014.

The changes to water bodies have taken place at regional level within the RBDs, which may also account for the differences between RBMPs. The RBMP for the North Apennines RBD notes that the Emilia-Romagna region updated its list of water bodies, in particular with regard to artificial water bodies, while the Tuscany region divided a couple of coastal water bodies based on monitoring results. In addition, several water bodies at regional boundaries were united.

The RBMP for the Southern Apennines RBD noted that 2009 national legislation (D. Lgs 30/2009) included steps for the identification of groundwater bodies which was likely to have been implemented for the second RBMPs.

[19] Italy subsequently clarified that there were already 32 lake water bodies in Sardinia in the 1st cycle.

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

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 (km2) of water bodies	Number of water bodies	Total area (km2) of water bodies
2016	ITA	40	49	1 812	14 053	49	667	24	1 517
2016	ITB	106	963	2 034	23 569	13	226	2	286
2016	ITC	33	14	1 297	13 139	11	55	51	1 917
2016	ITD	2	8	51	574	1	1	1	6
2016	ITE	36	362	493	6 975	6	15	25	1 279
2016	ITF	66	122	824	10 907	17	175	176	3 501
2016	ITG	32	93	726	7 560	57	116	217	6 216
2016	ITH	32	48	256	4 273	18	19	65	2 290
2016	Total	347	1 658	7 493	81 050	172	1 272	561	17 012
2010	ITA	40	49	1 853	14 428	49	664	24	1 519
2010	ITB	116		1 906	2 356	14	226	2	255
2010	ITC	33	14	1 304	13 865	11	55	48	1 902
2010	ITD	2	8	51	578	1	1	1	6
2010	ITE	38	362	501	7 112	6	15	22	1 173
2010	ITF	38	83	1 018		12	171	110	2 709
2010	ITG	1 (32)	0	755		57	78	217	6 212
2010	ITH	32	48	256	4 217	31	24	65	5 154
2010	Total	300		7 644		181	1 234	489	18 930

Source: WISE electronic reporting

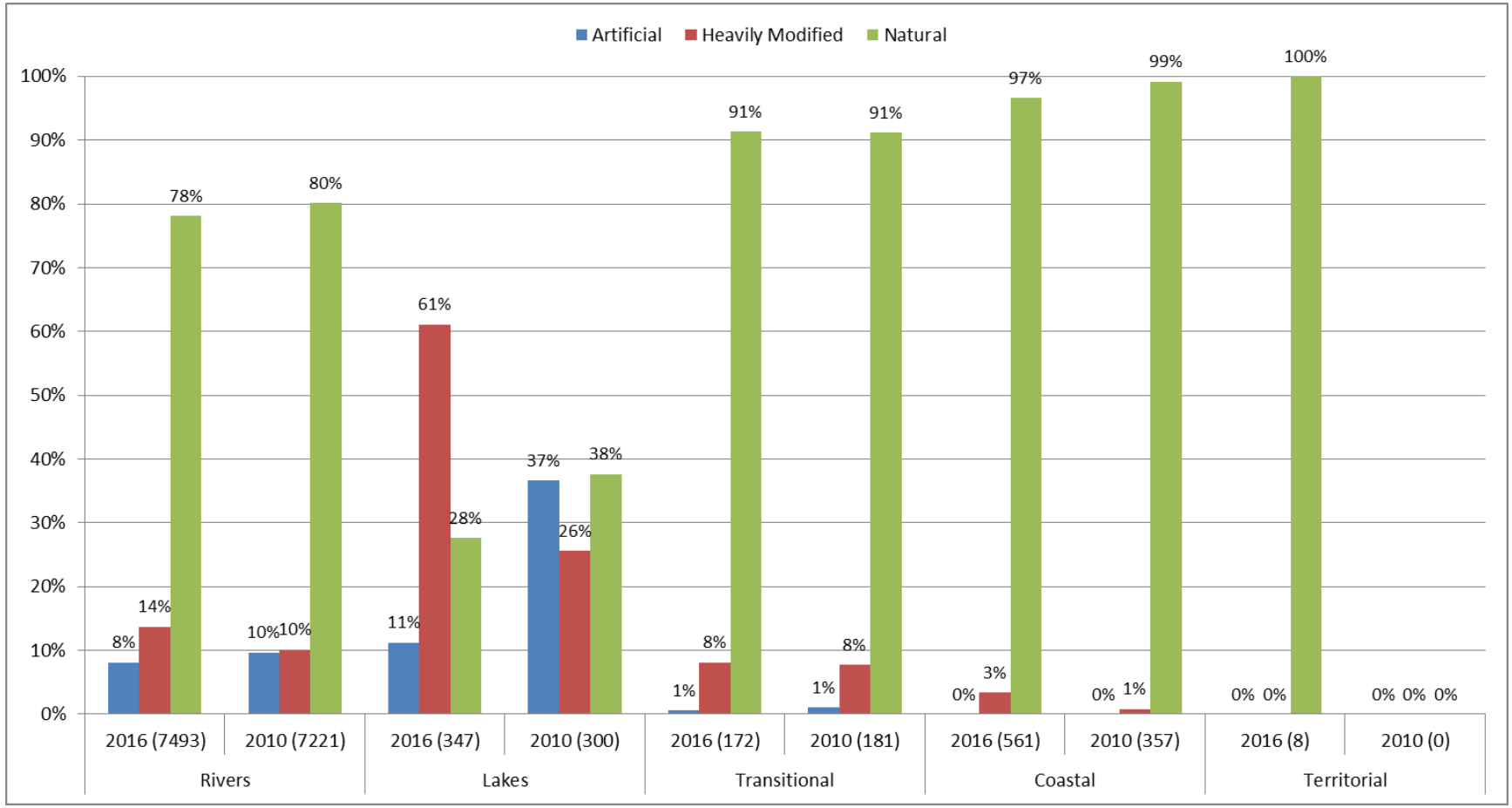
Table 2.2 Number and area of delineated groundwater bodies in Italy for the second and first RBMPs

Year	RBD	Number	Area (km^2)		
			Minimum	Maximum	Average
2016	ITA	118	1.2	7,818.02	427.34
2016	ITB	167	4.12	5,703.06	503.83
2016	ITC	222	0.22	3,144.61	133.86
2016	ITD	11	15.8	358.38	103.7

2016	ITE	128	3.95	1,355.23	209.41
2016	ITF	210	2.08	3,843.00	216.96
2016	ITG	114	2.89	3,234.28	169.42
2016	ITH	82	0.94	1,083.45	147.39
2016	Total	1,052			
2010	ITA	123	0.9	7,822.00	310.56
2010	ITB	141	4	9,192.22	574.09
2010	ITC	186	0.15	3,208.80	134.98
2010	ITD	11	43.63	3,208.80	444.5
2010	ITE	133	3.95	3,208.80	260.38
2010	ITF	139	2.35	1,461.00	135.75
2010	ITG	114			
2010	ITH				
2010	Total	847			

Source: WISE electronic reporting

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



Source: WISE electronic reporting

The RBMP emphasises that the main changes were made in the number of groundwater bodies. Better monitoring data appears to have been a key factor for many of the changes. No changes were reported for the Basilicata, Calabria and Lazio Regions, but updates are seen for the Campania, Molise and Puglia Regions. For Puglia, for example, the number of groundwater bodies increased from 10 to 29. For the Abruzzo Region in the South Apennines RBD, for example, further knowledge about hydrogeology and better monitoring data were the main factors. The RBMP for the South Apennines RBD also states that several groundwater bodies lie at the boundary between the Central Apennines RBD and the South Apennines RBD, and further coordination is needed to assign them definitively to one or the other RBD. It can be noted that further updates to the characterisation of water bodies and in particular groundwater bodies were underway or may occur.

The RBMPs do not describe how the changes to water bodies might have led to differences in the analysis of pressures, status or measures.

Table 2.3 shows the size distribution of surface water bodies in Italy in the second and first RBMPs (note that missing values are denoted by -9 999.00). It can be seen that the minimum and maximum sizes of rivers and lakes have decreased and the maximum size of coastal water bodies has also decreased. Table 2.4 summarises the information provided by Italy on how water bodies have evolved between the two cycles.

Table 2.3 Size distribution of surface water bodies in Italy in the second and first RBMPs

Year	RBD	River length (km^2)			Lake area (km^2)			Transitional ($km^{2)}$			Coastal (km^2)		
		Min	Max	Average	Min	Max	Average	Min	Max	Average	Min	Max	Average
2016	ITA	0.06	97.31	7.76	0.04	7.17	1.22	0.01	134.66	13.61	0.8	365.73	63.22
2016	ITB	0.14	108.64	11.59	0	277.05	9.09	0.4	118	17.35	137.29	148.27	142.78
2016	ITC	0.46	59.59	10.13	0	2.85	0.44	0	16.23	4.98	1.1	214.74	37.59
2016	ITD	2.06	41.67	11.25	1.05	6.82	3.94	0.88	0.88	0.88	5.54	5.54	5.54
2016	ITE	1.94	59	14.15	0.02	121.62	10.06	0.48	4.05	2.54	9.97	190.83	51.17
2016	ITF	0.17	201.5	13.24	0	15.64	1.84	0.07	65.23	10.27	1.45	99.92	19.89
2016	ITG	0.25	59.3	10.41	0.03	21.87	2.89	0.1	20.23	2.04	0.11	355.6	28.65
2016	ITH	2.35	48.66	16.69	0.11	6.92	1.48	0.01	14.91	1.07	6.83	110.87	35.22
2010	ITA	0.06	97.25	7.79	0.04	7.18	1.22	0.01	134.77	13.56	0.81	366.11	63.3
2010	ITB	-9 999	109.74	1.24	-9 999	362.74	-72.45	0.4	117.72	16.17	106.77	148.43	127.6
2010	ITC	0.4	85.72	10.63	0	2.85	0.43	0	16.23	4.98	2.64	424.14	39.62
2010	ITD	2.06	41.66	11.34	1.05	6.82	3.93	0.88	0.88	0.88	5.6	5.6	5.6
2010	ITE	1.24	59.02	14.19	0.02	121.71	9.52	0.49	4.06	2.55	10	191.01	53.31
2010	ITF	-9 999	202.37	-2 692.50	0.01	12.37	2.19	0.08	65.68	14.22	1.88	101.29	24.62
2010	ITG	-9 999	59.29	-400.62	0.29	0.29	0.29	0	20.21	1.38	0.11	355.32	28.63
2010	ITH	1.99	49.16	16.47	0.11	6.95	1.49	0.01	14.93	0.78	8.79	303.52	79.3

Source: WISE electronic reporting

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

Type of water body change for second RBMP	Rivers	Lakes	Transitional	Coastal	Territorial	Groundwater
Aggregation	18	1				26
Splitting	368	2	5	5		36
Change	210	26	8	11		104
Aggregation and splitting	275					12
Change in code	3165	151	130	314		292
Extended Area						28
Reduced Area						21
Creation	607	29	10	136	8	238
Deletion	767	17	39	87		48
No change	2850	138	19	95		295
Total water bodies before deletion	8260	364	211	648	8	1100
Delineated for second RBMP (after deletion from first RBMP)	7493	347	172	561	8	1052

Source: WISE electronic reporting

2.1.2 Identification of transboundary water bodies

Transboundary river water bodies have been identified in three RBDs (the Eastern Alps, Padan and the North Apennines) and transboundary lake water bodies have been identified in Padan. Eight transboundary groundwater bodies have been identified in the Eastern Alps District but not in other RBDs.

2.1.3 Typology of surface water bodies

The number of water body types per RBD and water body category remained largely the same between the first and second RBMPs, with only a slight increase (Table 2.5). No information was found in the RBMPs assessed about whether the typology was made biologically relevant.

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

RBD	Rivers		Lakes		Transitional		Coastal		Territorial	
	2010	2016	2010	2016	2010	2016	2010	2016	2010	2016
ITA	88	84	8	8	10	10	4	4		1
ITB	90	88	13	12	6	6	2	1		1
ITC	63	71	7	7	7	7	7	9		1
ITD	5	7	1	2	1	1	1	1		1
ITE	64	67	7	11	4	4	6	8		1
ITF	107	112	5	13	7	14	10	25		1
ITG	12	10	6	6	10	10	5	5		1
ITH	15	12	4	4	1	6	5	5		1
TOTAL	373	364	24	29	27	40	22	39		1

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

Member States were asked to report "Not applicable" if there is no corresponding intercalibration type for national types. Many national types (heavily modified, artificial and natural) have been intercalibrated. Several of the national types for Italy in all of the RBDs do not appear to have corresponding intercalibration types[20].

2.1.4 Establishment of reference conditions for surface water bodies

Table 2.6 shows the percentage of surface water body types in Italy with reference conditions established. Type specific reference conditions have been established for all relevant biological quality elements and none have been established for physicochemical quality elements or hydromorphological quality elements[21,22]. The only exceptions were for six transitional water body types in Sicily RBD, where all reference conditions have been established for

[20] Italy subsequently clarified that sectoral legislation, namely Ministerial Decree DM 260/2010, defined broad types (intercalibration macro-types) which are homogenous from the abiotic and ecological point of view. Such broad types are the ones identified within the intercalibration exercises run between 2005 and 2017. In accordance with the provisions defined by national legislation it is possible to comprise within these broad intercalibration types all national types. Italy stated that this approach guarantees that intercalibration results are extended to all national types.

[21] Italy subsequently stated that the process is on-going.

[22] Italy subsequently highlighted that for river hydromorphological quality elements the reference conditions are type specific. Italy also stated that regarding the hydromorphological aspects of the lakes, the distinction by type was made with regard to the hydrological aspects, while for morphological conditions there is no subdivision by type.

physicochemical quality elements and only some established for relevant biological quality elements.

Table 2.6 ***Percentage of surface water body types in Italy with reference conditions established for all, some and none of the biological, hydromorphological and physicochemical quality elements. Numbers in parenthesis are the number of types in each category***

Water category	Water types	Biological quality elements	Hydromorphological quality elements	Physicochemical quality elements
Lakes (29)	All	97 %		
	Some			
	None	3 %	100 %	100 %
Rivers (364)	All	100 %		
	Some			
	None		100 %	100 %
Coastal (39)	All	100 %		
	Some			
	None		100 %	100 %
Transitional (40)	All	85 %		15 %
	Some	15 %		
	None		100 %	85 %

Source: WISE electronic reporting

2.1.5 Characteristics of groundwater bodies

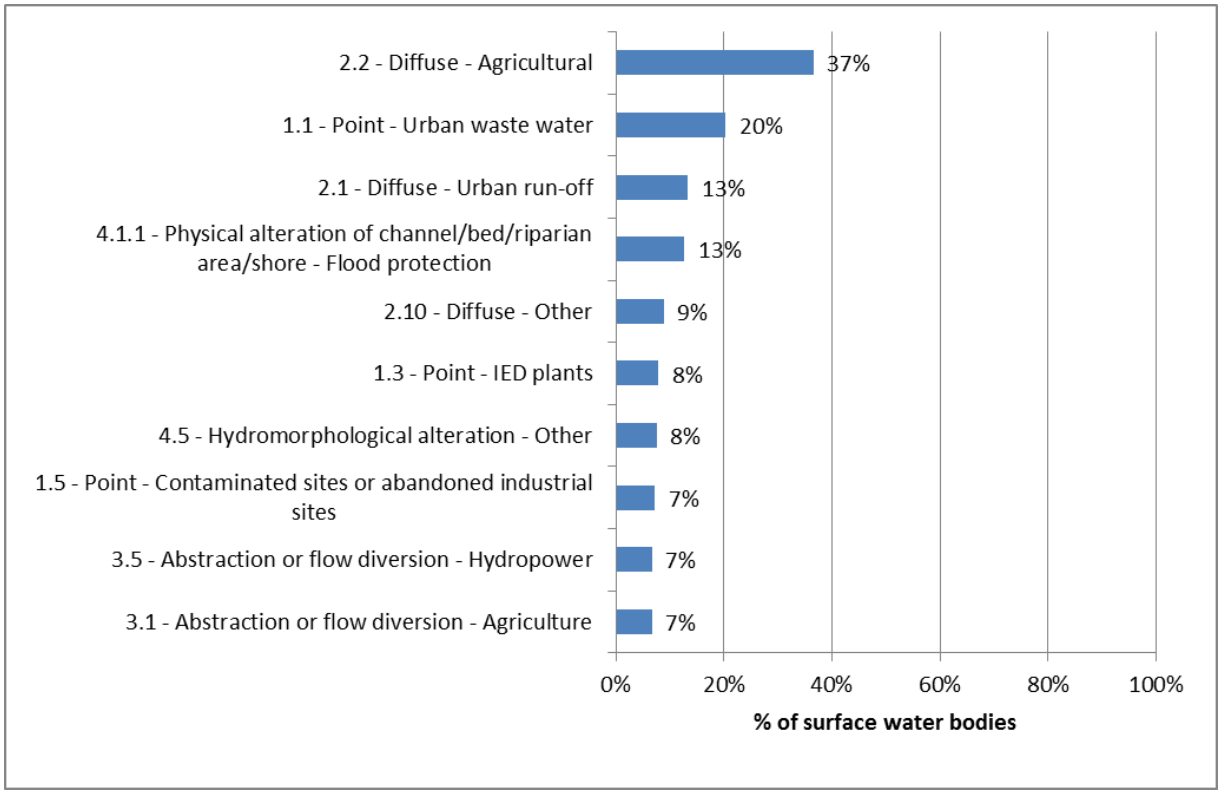
The geological formation of the aquifer types in which groundwater bodies reside, along with details of whether groundwater bodies are layered or not, are generally reported. There are some geological formations were no information was reported about whether it was layered or not. Further characterisation work has been reported since the first RBMP with the inclusion of the assessment of linkages to surface water bodies and terrestrial ecosystems. The further characterisation of groundwater bodies was not complete: for some RBDs this information was reported as an Annex 0 for the South Apennines RBD, Sardinia RBD and Sicily RBD and only for some water bodies in the Central Apennines RBD[23].

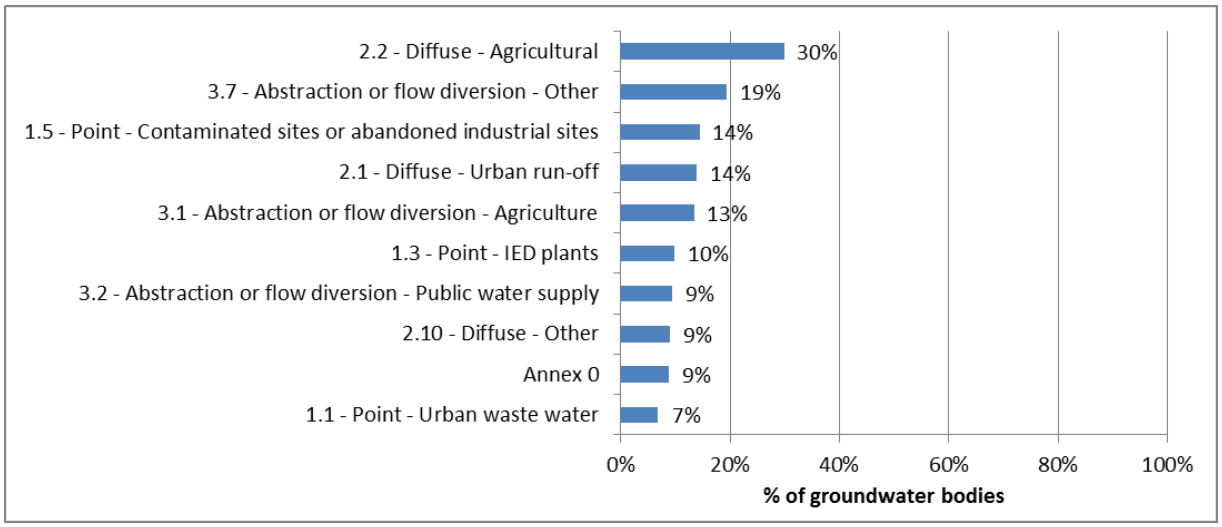
[23] Italy subsequently clarified that for the Eastern Alps RBD this task is going to be carried out within the next cycle. For the Southern Apennines RBD a working group has been established in order to further strengthen characterization of groundwater bodies, in particular for the linkages between surface water bodies.

2.1.6 Significant pressures on water bodies

In the second RBMP, the significant pressures reported to affect the most surface water bodies were Diffuse - Agricultural (37 %), and then Point - Urban waste water (20 %) (Figure 2.2). “No significant pressures” was reported for 26 % of surface water bodies overall. In the first RBMP, Italy reported on significant pressures as aggregated pressures making direct comparison with data from the second cycle difficult. There appears to be a significant decrease in the number of water bodies with “No significant pressures” reported, with an increase in the reporting of all other categories of significant pressures (diffuse, point, abstractions and flow and physical changes) (Figure 2.3). This is an indication that there have been improvements made in the definition of significant pressures and changes between cycles.

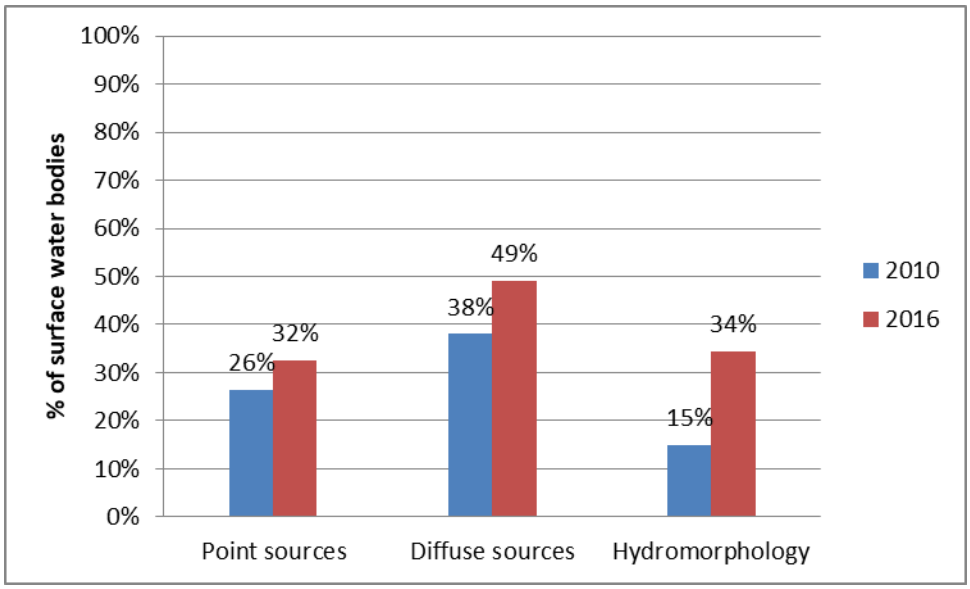
Figure 2.2 The most significant pressures on surface water bodies and groundwater bodies in Italy for the second RBMP





Source: WISE electronic reporting

Figure 2.3 ***Comparison of pressures on surface water bodies in Italy in the first and second RBMPs. Pressures presented at the aggregated level. Note there were 8581 identified surface water bodies for the second RBMP and 8641 for the first RBMP***



Source: WISE electronic reporting.

In 2016, the significant pressures reported to affect the most groundwater bodies were Diffuse - Agricultural (30 %), and then Abstraction or flow diversion - Other (19 %). "No significant pressures" were reported for 25 % of groundwater bodies.

For 2016, a total of 49 significant pressures were not assessed for surface waters. The numbers varied in each RBD ranging from 1 (Sardinia RBD) to 39 (the South Apennines RBD) pressures. A total of 52 significant pressures were not assessed for groundwaters. The numbers varied in each RBD ranging from 7 to 50 pressures. Whilst many of the pressures were not relevant to groundwater some were, such as Groundwater - Recharges and Groundwater - Alteration of water level or volume were. In some cases the RBMPs do not describe why certain pressures have not been assessed. The RBMP for the Northern Apennines RBD indicates that for the second RBMPs, the list of pressures set out in the Commission's WFD Reporting Guidance 2016 was used across the whole RBD, based on agreements with the regions. This implies an update to the list of pressures used previously - however, the RBMP does not set out the changes.

2.1.7 Definition and assessment of significant pressures on surface and groundwater

For surface waters the tools used to define significant pressures varied between RBDs. Generally, a combination of both expert judgement and numerical tools were used for defining

point and diffuse source pressures and pressures from water flow for surface water. In some instances just numerical tools were used, for example in the Northern Apennines and Sardinia RBDs they were used for point and diffuse pressures on surface water.

For surface water bodies significance of pressures was reported to be defined in terms of thresholds and generally linked to the potential failure of objectives for all RBDs. Two RBDs (the Northern Apennines and Sicily) reported to WISE that the definition of significance of pressures was not linked to the potential failure of objectives. The RBMP for the Northern Apennines RBD notes that the assessment of significance in the first RBMP was carried out without indicators and without threshold values defined for significance: both elements were introduced for the second RBMP. The RBMP notes that the new system was agreed with the regions in the RBD but in practice was undertaken by the regions in a partial manner, using data available and thresholds for significance that were "not necessarily homogenous"; however, preliminary results in the draft RBMP were closely reviewed and verified, in particular in terms of threshold values. The RBMP for the Southern Apennines RBD notes that the methodology has been "refined" for the second RBMPs. The RBMP describes a step-process using indicators for different types of pressures, alongside estimates of the importance of different pressures on water status; the results were then refined by analysis of "test" areas and by expert judgement.

For groundwaters, the tools used to define significant pressures varied between RBDs. Generally, a combination of both expert judgement and numerical tools were used for defining point and diffuse source pressures and pressures from water flow. However there were some differences for example, only numerical tools were used in the North Apennines RBD and Serchio RBDs. Pressures from artificial recharge were only assessed in Sicily RBD using numerical tools.

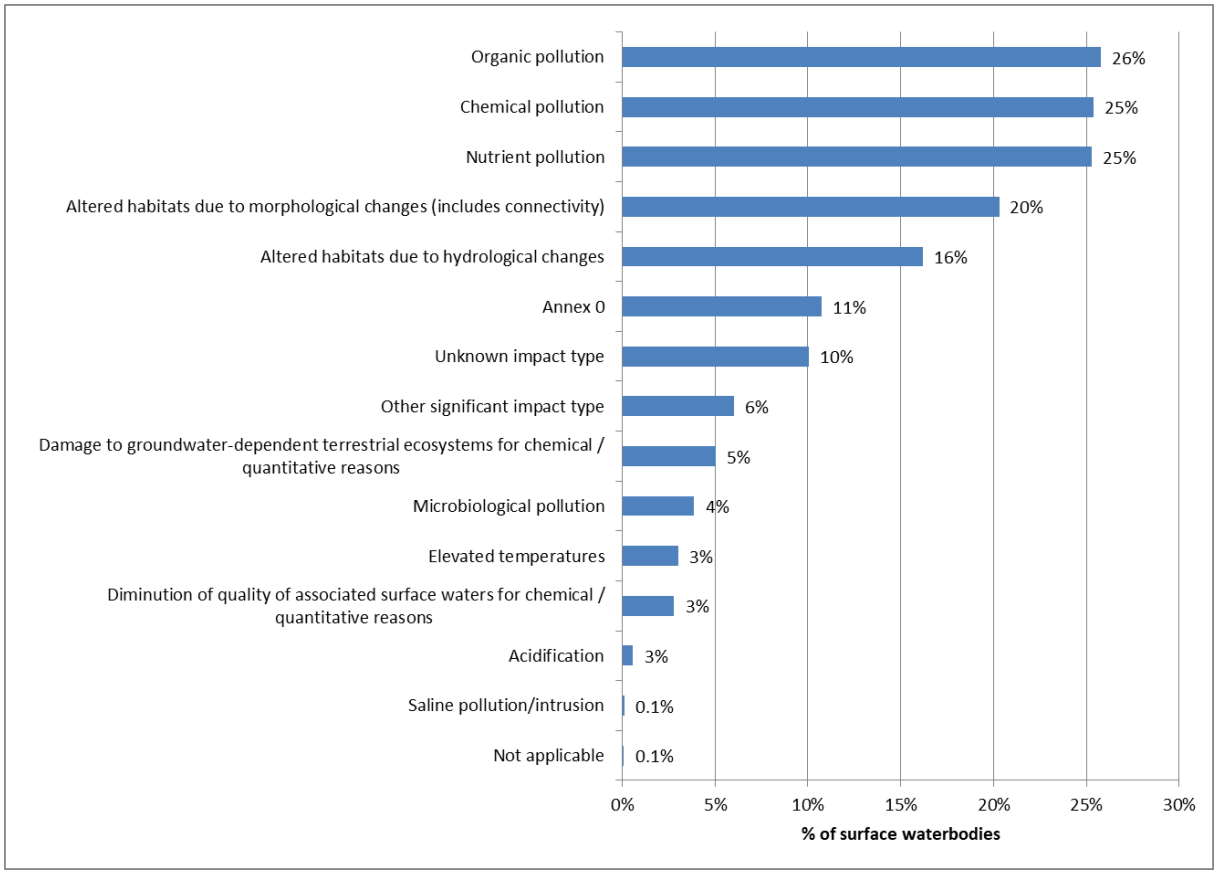
For groundwater, significance of pressures was reported to be defined in terms of thresholds and generally linked to the potential failure of objectives for all RBDs.

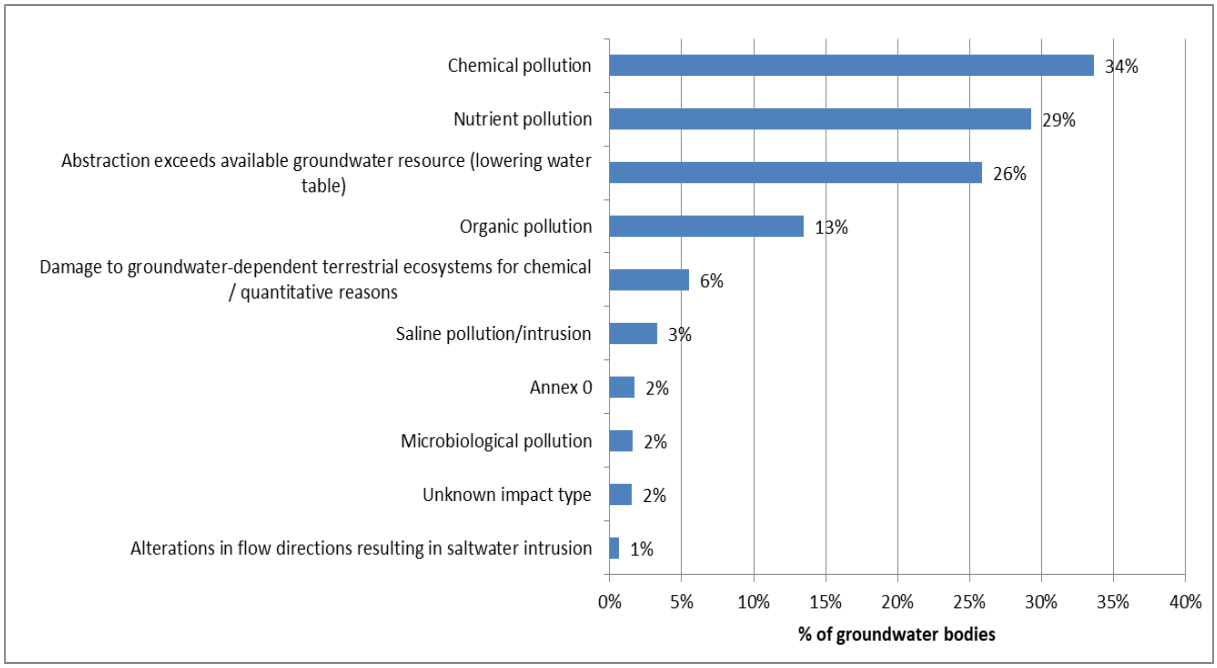
The RBMPs assessed do not describe specific tools used for the assessment of significance of different pressures for surface waters or groundwaters.

2.1.8 Significant impacts on water bodies

In the second RBMP, the most significant impacts on surface water bodies were organic pollution, chemical pollution and nutrient pollution which were reported to affect 25-26 % of surface water bodies (Figure 2.4).

Figure 2.4 Significant impacts on surface water and groundwater bodies in Italy for the second RBMP. Percentages of numbers of water bodies





Source: WISE electronic reporting

For groundwaters, the most significant impacts were classified as chemical pollution (34 %), nutrient pollution (29 %), and abstraction exceeding available groundwater resource (lowering water table) (26 %) (Figure 2.4). Italy did not report on impacts in the first RBMPs.

2.1.9 Groundwater bodies at risk of not meeting good status

Across the RBDs the proportion of groundwater bodies reported to be at risk of failing to meet good chemical status ranged from 24 to 64 %. The pollutants causing groundwater bodies to be at risk from failing good chemical status were reported. Groundwater bodies reported to be at risk of failing to meet good quantitative status, ranged from 6 to 46 %.

2.1.10 Quantification of the gap and apportionment of pressures

The Priority Substances and other substances causing the failure of good chemical status were reported for all eight RBDs. The measures to tackle these substances to achieve good status by 2021 (or 2027) were only reported for 3 of the RBDs.

2.1.11 Inventories of emissions, discharges and losses of chemical substances

Article 5 of the Environmental Quality Standards Directive (EQS Directive)[24] 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 (respectively suppressing) emissions, discharges and losses for priority substances (respectively priority hazardous substances).

Italy reported inventories of emissions for five of the eight RBDs[25]. For three of the RBDs there were 41 substances or groups of substances (Padan, the Central Apennines and Sardinia), for the Eastern Alps RBD there were 29, and for the Serchio RBD 10.

The two step approach from the Common Implementation Strategy Guidance Document n°28 has been followed for almost all substances considered in the inventories. Tier 1 (point source

[24] 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

[25] Italy subsequently explained that the remaining inventories, even if not reported in the RBMPs, were prepared and submitted through Reportnet, where they were uploaded in an envelope under the reporting of the 1st RBMPs.

information) and Tier 2 (riverine load) of the methodology was implemented for many of the substances included in the inventories, including for some of the substances deemed relevant at RBD level. The data quality was assessed as uncertain, medium or was not reported.

2.2 Main changes in implementation and compliance since the first cycle

Overall, there was an increase in the number of water bodies between the first and second RBMP. There was a similar increase in lake water bodies and coastal water bodies of 16 % and 15 % respectively. The most significant increase was for groundwater bodies of 32 %. Furthermore, the Sicily RBD did not report any groundwater bodies in the first RBMP while there were 82 reported in the second RBMP. For river water bodies however there was an overall decrease of about 2 % and a decrease of 4 % for transitional water bodies. Eight territorial water bodies were reported in the second RBMP and there were none in the first RBMP.

The technical criteria for the identification of artificial water bodies and heavily modified water bodies changed since the first RBMP and there were slightly more heavily modified water bodies (15 %) in the second RBMP.

In the first RBMP, Italy reported on significant pressures as aggregated pressures making direct comparison with data from the second RBMP difficult. There appears to have been a considerable decrease in the number of water bodies with “No significant pressures” reported, with an increase in the reporting of all categories of significant pressures (diffuse, point, abstractions and flow and physical changes). This provides an indication that there was an improvement in the definition of significant pressures.

2.3 Progress with Commission recommendations

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

- Recommendation: *Where there are currently high uncertainties in the characterisation of the RBDs these need to be addressed in the current cycle, to ensure that adequate measures can be put in place before the next cycle.*

  Assessment: In the first RBMP, Italy’s regions appeared to take different approaches to characterisation. In some cases characterisation was not completed and it did not take on board intercalibration work. Notably, groundwater bodies were not designated in Sicily.

In the second cycle, groundwater bodies were delineated in all RBDs including Sicily, which shows that this part of the recommendation has been fulfilled. Italy subsequently clarified how the intercalibration process has been translated to national types. There have been improvements on the definition of significant pressures, although there are still regional approaches to characterisation used particularly for the definition of the significance of pressures[26]. Therefore, this recommendation has been partially fulfilled.

[26] Italy subsequently clarified that there were already 32 lake water bodies in Sardinia in the first cycle.

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

Article 8.1 of the WFD requires Member States to establish monitoring programmes for the assessment of the status of surface water and of groundwater in order to provide a coherent and comprehensive overview of water status within each RBD.

Italy reported 134 different monitoring programmes covering all four surface water categories and groundwater.

Monitoring methods for ecological status have been updated to fully implement national legislation (Ministerial Decree 56/2009, which covers monitoring and classification of water bodies, and Ministerial Decree 260/2010, on technical criteria for the classification of surface water bodies[27]).

Monitoring programmes in place in the first RBMPs followed more limited national approaches and were not aligned with the WFD requirements: for example, appropriate biological assessment methods were essentially not in place in any RBD. The introduction of the two Ministerial Decrees mentioned above greatly improved the monitoring of ecological status/potential in Italy in line with WFD requirements, even if the second RBMPs do not describe explicitly the changes since the first plans[28].

Monitoring sites

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

[27] Italy subsequently clarified that there were already 32 lake water bodies in Sardinia in the 1st cycle.

[28] Italy clarified that for some RBDs the changes in methodology and classification were described in the RBMPs. This is for example the case for the Eastern Alps RBMP.

Table 3.1 Number of sites used for surveillance and operational monitoring in Italy for the second and first RBMPs. Note that for reasons of comparability with data reported for the first RBMPs, the data for the second RBMPs 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 RBMP								
IT_A	679	241	50	10		211		52
IT_B	389	618	75	92		48		18
IT_C	66	159	5	8		13	1	201
IT_D	13	8	1	1		1		1
IT_E	184	111	12	20	6		22	14
IT_F	278	277	23	16	34	15	264	129
IT_G	38	80	0	23		140	17	24
Total by type of site	*1 647*	*1 494*	*166*	*170*	*40*	*428*	*304*	*439*
Total number of monitoring sites	*3101*		*329*		*453*		*673*	
first RBMP								
IT_A	298	470	14	10		93	32	48
IT_B	365	259	38	45		33		12
IT_C	217	149	7	13	2	9	20	189
IT_D	32	5	2	2	2		1	
IT_E	115	68	9	16				14
IT_F	111	277	0	0				
Total by type of site	*1 138*	*1 228*	*70*	*86*	*4*	*135*	*53*	*263*
Total number of monitoring sites	*2 288*		*176*		*139*		*316*	

Sources: Member States electronic reporting to WISE.

Table 3.2 Number of monitoring sites in relevant water categories used for different purposes in Italy

Monitoring Purpose	Rivers	Lakes	Transitional	Coastal
BWD - Recreational or bathing water - WFD Annex IV.1.iii				24
CHE - Chemical status	1 918	250	243	381
DWD - Drinking water - WFD Annex IV.1.i	48	18		
ECO - Ecological status	2 875	301	406	537
HAB - Protection of habitats or species depending on water - WFD Annex IV.1.v	81	10	33	
INV - Investigative monitoring	141	3	96	13
MSF - Marine Strategy Framework Directive monitoring network				39
NID - Nutrient sensitive area under the Nitrates Directive - WFD Annex IV.1.iv	381	11	74	38
OPE - Operational monitoring	1 494	170	428	439
QUA - Quantitative status	42			
REF - Reference network monitoring site	53			
SHE - Shellfish designated waters - WFD Annex IV.1.ii	5		54	23
SOE - EIONET State of Environment monitoring	1 528	182	111	269
SUR - Surveillance monitoring	1 647	166	40	304
TRE - Chemical trend assessment	26		102	39
UWW - Nutrient sensitive area under the Urban Waste Water Treatment Directive - WFD Annex IV.1.iv	75	6	64	35
Total sites irrespective of purpose	**4 038**	**387**	**506**	**934**

Source: WISE electronic reporting

In seven of the eight RBDs, information was reported on the sites used for surveillance and operational monitoring. The Sicily RBD only reported whether sites were for ecological or chemical status purposes. All eight RBDs have identified all four categories of surface waters.

There are significant gaps in some of the RBDs in terms of surveillance monitoring, with none being undertaken in five of the seven RBDs (not including Sicily, as explained above) for transitional waters, three of the seven RBDs for coastal waters and one of the seven RBDs for lakes. At the national level 37 % of the total sites reported were used for surveillance and 43 % for operational monitoring. Operational monitoring was not reported for transitional waters in the Central Apennines RBD, but surveillance monitoring was in place.

Information is only available for seven RBDs (Eastern Alps, Padan, North Apennines, Serchio, Central Apennines, South Apennines and Sardinia) on the monitoring sites reported in the first RBMPs. Overall in these six RBDs there were significant increases in the number of sites in each water category from the first to the second RBMPs. There was a 45 % increase in river surveillance sites though there was a decrease in numbers in the North Apennines and Serchio RBDs. The decreases in site numbers for these two RBDs affected all water categories.

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.

Table 3.3 Quality elements monitored for the second RBMPs in Italy (excluding River Basin Specific Pollutants). Note: quality elements 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
Lakes	Yes	Yes	Yes	Yes	Yes			No		Yes	Yes	Yes
Rivers	Yes	Yes	Yes	Yes	Yes			No	Yes	Yes	Yes	Yes
Transitional	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No		No		Yes
Coastal	Yes			Yes		Yes	Yes	No	Yes	No		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
Lakes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Rivers	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Transitional	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Coastal	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Source: WISE electronic reporting

No biological quality elements were reported to be monitored in coastal and transitional waters in the Serchio RBD[29]. Phytoplankton was monitored in the other seven RBDs and benthic invertebrates in six RBDs. Macroalgae and angiosperms were only monitored in four RBDs with coastal waters. Phytoplankton was reported to be monitored in lakes in all eight RBDs but there were significant gaps in the monitoring of the other relevant biological quality elements. Macrophytes and fish were monitored in lakes in only three RBDs, phytobenthos and benthic invertebrates in two RBDs. Only in the Eastern Alps RBD are all the expected biological quality elements monitored in lakes.

The monitoring of the expected biological quality elements in rivers was much more complete than for the other water categories. Fish was the only missing quality element in the Serchio and Sicily RBDs.

The biological quality elements monitored in transitional waters in most RBDs were benthic invertebrates (seven RBDs), followed by phytoplankton and macroalgae (four RBDs), angiosperms (two RBDs) and fish (two RBDs). Macrophytes were also reported for transitional waters in four RBDs and phytobenthos in one RBD.

In two RBDs none of the coastal water bodies in surveillance monitoring were sampled for all required biological quality elements. The proportions in the other two RBDs in which surveillance monitoring was reported were 6 % and 53 %. None of the lakes included in surveillance monitoring were sampled for all required biological quality elements in five RBDs; in the 6th (Eastern Alps RBD) 22 % were. In one RBD none of the river water bodies were sampled for all required biological quality elements; the proportion sampled for all required biological quality elements in the other six RBDs in which surveillance monitoring was reported ranged from 2 % to 44 %. None of the transitional water bodies included in surveillance monitoring were sampled for all required biological quality elements.

There were significant gaps in the monitoring of hydromorphological quality elements. Only two RBDs (the Eastern Alps and Padan RBDs) monitored morphological conditions in coastal waters; tidal regimes were not monitored in any RBD. In transitional waters, the only hydromorphological quality element which was monitored was morphological conditions in three of the eight RBDs (Eastern Alps, Padan and North Apennines RBDs)[30]. Hydrological regime was only monitored in lakes in the Padan RBD and morphological conditions only in

[29] Italy subsequently stated that biological quality elements are monitored in coastal water in the Serchio RBD. This might be a reporting error.

[30] Italy subsequently stated that hydrological regime was monitored in transitional water in the Eastern Alps RBD.

the Central Apennines RBD[31]. Continuity was also reported for lakes in the Central Apennines RBD. All three required hydromorphological quality elements were monitored in rivers in only one RBD (Sardinia)[32]. In three other RBDs, hydrological regime and morphological conditions were monitored in rivers, and in another RBD continuity was monitored.

Only one water body (a river) included in surveillance monitoring was monitored for all required hydromorphological quality elements. Overall, 33 % of the river water bodies 23 % of the lake water bodies and 22 % of the coastal water bodies included in surveillance monitoring were monitored for all required physicochemical quality elements. None of the transitional water bodies was monitored for all required physicochemical quality elements. All the relevant physicochemical quality elements were monitored in coastal waters in most RBDs. The exceptions were transparency conditions, salinity conditions and acidification status in the South Apennines RBD and salinity conditions in the Sicily RBD[33]. There were gaps in the monitoring of physicochemical quality elements in lakes in several RBDs. Oxygenation and nutrient conditions were monitored in lakes in all RBDs. In rivers, nutrient and oxygenation conditions were monitored in all RBDs. However, only two RBDs monitored transparency conditions, six monitored thermal conditions, five monitored salinity conditions and six monitored acidification status. Thermal, oxygenation and nutrient conditions were monitored in transitional waters in all RBDs, transparency was monitored in four RBDs, salinity in six and acidification status in seven.

Annex V of the WFD provides guidance on the frequency of monitoring of the different quality elements. Surveillance monitoring should be carried out for each monitoring site for a period of one year during the six years period covered by a RBMP. For phytoplankton this should be done twice during the monitoring year and for the other biological quality elements once during the year. As a guideline, operational monitoring should take place at intervals not exceeding once every six months for phytoplankton and once every three years during the six year cycle for the other biological quality elements. Greater intervals may be justified on the basis of technical knowledge and expert judgement.

All biological quality elements used for surveillance monitoring were sampled at least at the minimum recommended frequency at all sites at which they were monitored.

[31] Italy subsequently stated that morphological conditions were also monitored in lakes in the Padan RBD.

[32] Italy subsequently stated that all 3 required hydromorphological quality elements are monitored in rivers in the Padan and North Appennine RBDs.

[33] Italy subsequently stated that transparency conditions, salinity conditions and acidification status were not monitored in coastal waters in the Sardinia and Sicily RBDs.

Two biological quality elements (macroalgae and angiosperms) used for operational monitoring were sampled at least at the minimum recommended frequency at all sites at which they were monitored. For macrophytes and benthic invertebrates this was done at 96 % of the sites, for phytobenthos at 92 % of the sites and for phytoplankton at 68 % of the sites.

River Basin Specific Pollutants and matrices monitored

River Basin Specific Pollutants were monitored in five of the eight RBDs in coastal waters, lakes, and rivers, but only in four RBDs in transitional waters (the missing RBD is the Central Apennines RBD).

River Basin Specific Pollutants were reported to be monitored in five of the eight RBDs in coastal waters, lakes, and rivers[34] and in four RBDs in transitional waters.

A total of 289 River Basin Specific Pollutants were reported by Italy in schema element "chemicalSubstanceCode". 427 substances were reported in schema element "chemicalSubstanceOther", which should include all River Basin Specific Pollutants for which a code was not one of the choices available under "chemicalSubstanceCode". However, there was a significant duplication of substances because there were often slight differences in how the same substance had been reported, for example, misspellings and Chemical Abstracts Service numbers reported without a name. It is, therefore, not clear how many River Basin Specific Pollutants in total have been identified in Italy[35]. This assessment is based on the 289 chemical substances which have been clearly reported.

Table 3.4 shows the number of sites used to monitor River Basin Specific Pollutants in Italy in the first and second RBMPs.

Table 3.4 Number of sites used to monitor River Basin Specific Pollutants reported in the second RBMPs and non-priority specific pollutants and/or other national pollutants reported in the first RBMPs in Italy. Note the data from both cycles may not be fully comparable as different definitions were used in the first one

RBMP		Rivers	Lakes	Transitional	Coastal
first	Sites used to monitor non-priority specific pollutants and/or other national pollutants (Data from six RBDs)	367	41	32	60
second	Sites used to monitor River Basin Specific	1256	101	129	134

[34] Italy subsequently stated that River Basin Specific Pollutants were monitored in all RBDs in coastal waters, lakes and rivers.

[35] Italy acknowledged that there are problems with the information reported to WISE in these schema elements and work is under way to determine how many River Basin Specific Pollutants are in fact monitored in Italy.

	Pollutants – reported at the quality element level (Data from five RBDs)				

Sources: WISE electronic reporting

A total of 12509 monitoring sites for all purposes were reported for Italy (all eight RBDs). 1620 (13 %) of these sites were monitored for River Basin Specific Pollutants (reported at the generic level by five RBDs). 211 River Basin Specific Pollutants were monitored in coastal waters, 247 in lakes, 273 in rivers and 162 in transitional waters. Five substances were monitored in biota (without further discrimination), 37 in biota other than fish, 65 in sediment, five in settled sediments and 285 in water.

The River Basin Specific Pollutants monitored at most sites was arsenic (2098 sites), followed by chromium (2094 sites), terbuthylazine (1294 sites) and copper (1087 sites). There were inconsistencies in the reporting in WISE which complicate this assessment: the number of sites reported to be monitoring each River Basin Specific Pollutant (reported in schema element chemicalSubstance) is greater than the number of sites reported to be monitoring River Basin Specific Pollutants at the generic level (schema element qeCode). The former was based on data from eight RBDs and the latter from five RBDs. As Italy has subsequently acknowledged, there are problems with the reporting of the relevant elements to WISE. Therefore this assessment should be treated with caution.

Annex V of the WFD provides guidance on the frequency of monitoring of the different quality elements: once every three months is recommended for river basin specific pollutants. Surveillance monitoring should be carried out for each monitoring site for a period of one year during the six year period covered by a river basin management plan. For river basin specific pollutants this should be done four times for the surveillance year, and for operational monitoring four times a year for each year of the cycle.

Of the 236 River Basin Specific Pollutants included in surveillance monitoring, 103 were sampled at least at the minimum recommended frequency at all sites where they were monitored and three substances at none of the sites. Of the 240 substances included in operational monitoring, 51 were sampled at least at the minimum recommended frequency at all sites where they were monitored and 32 substances at none of the sites.

Annex V, section 1.3.4 of the WFD does not explicitly define the matrices to which the minimum recommended frequency of monitoring of River Basin Specific Pollutants (“Other Pollutants”) applies. Recommended monitoring frequencies are specified for Priority Substances in biota and sediment in Article 3(2)c of EQS Directive 2008/105/EC: this is once per year for operational and surveillance monitoring purposes. For consistency this

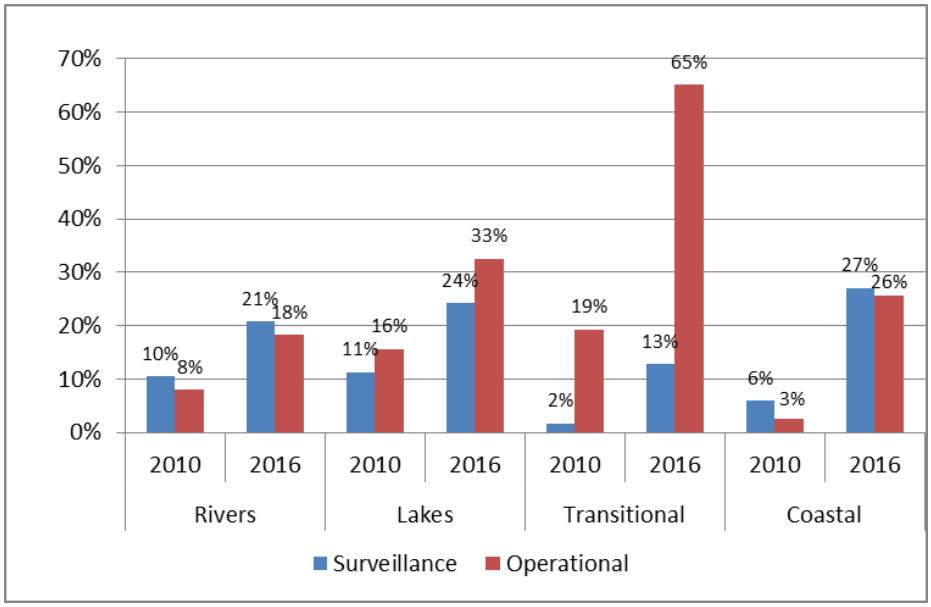
recommended frequency of once per year has been applied to the monitoring of River Basin Specific Pollutants in biota/sediment.

In terms of the frequency of monitoring of River Basin Pollutants in biota and other biological matrices, 3 of the 40 pollutants were monitored at all sites where they were monitored at a frequency of at least once a year. There were no substances for which no sites were sampled at less than the minimum recommended frequency. 13 of the 67 pollutants monitored in sediment or suspended sediment were monitored at least at the minimum recommended frequency at all sites where they were monitored and for five pollutants no sites met this minimum recommended frequency.

Surveillance monitoring of surface water bodies

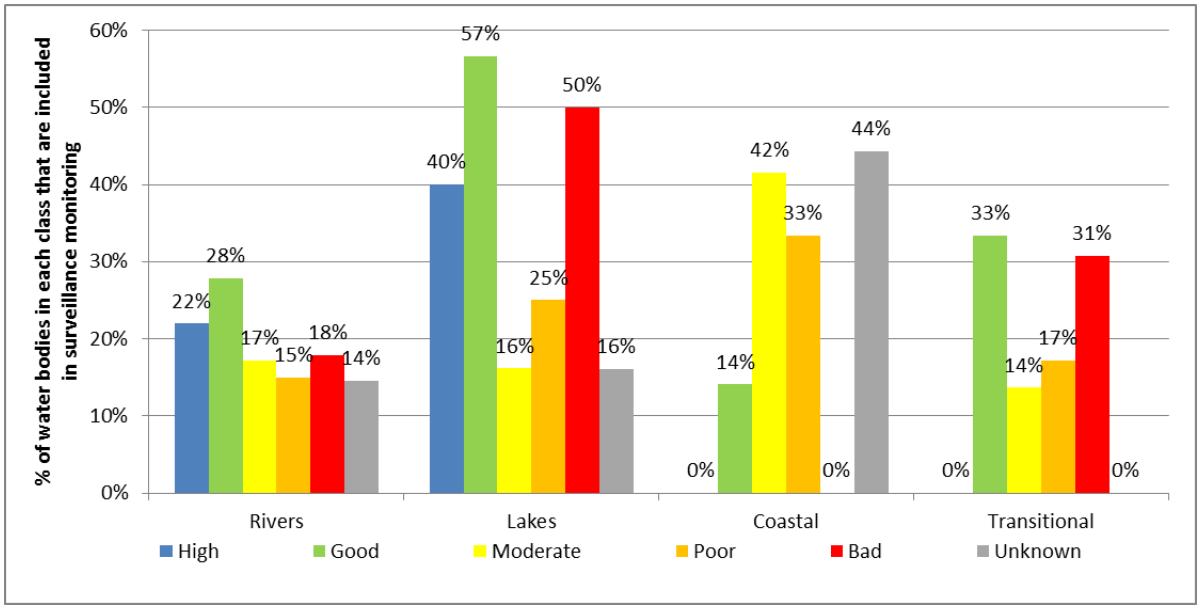
Figure 3.1 shows the percentage of water bodies object of surveillance and operational monitoring in both the first and second RBMPs. Figure 3.2 shows that the proportion of water bodies in each class that were included in surveillance monitoring varied between water body categories.

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



Source: WISE electronic reporting

Figure 3.2 Proportion of water bodies in each ecological status/potential class that are included in surveillance monitoring in Italy



Source: WISE electronic reporting

In rivers, 21 % of water bodies were included in surveillance and 18 % in operational monitoring and in coastal waters 27 % were included in surveillance compared to 26 % for operational monitoring. In lakes and transitional waters there were fewer water bodies monitored for surveillance purposes than for operational. There were large differences between RBDs in the proportions included in either purpose: for example 5 % of river water bodies in surveillance monitoring in the North Apennines RBD, and 36 % in the Central Apennines RBD. Information was only available for six RBDs for the first RBMPs. In these six RBDs, 12 % of surface water bodies were included in surveillance monitoring and 10 % in operational. In the same six RBDs, for the second RBMPs, 25 % of surface water bodies were included in surveillance and 22 % in operational. There were also increased proportions for the second RBMPs for the four water categories, and for surveillance and operational monitoring.

Operational monitoring of surface water bodies

All four relevant biological quality elements are used in operational monitoring of coastal waters in Italy as a whole: the predominant biological quality element is phytoplankton (76 % of coastal water bodies in operational monitoring) followed by benthic invertebrates (60 %), angiosperms (33 %) and macroalgae (25 %). The most commonly used biological quality element for operational monitoring in lakes was phytoplankton (77 % of lake water bodies in operational monitoring), followed by macrophytes (9 %), fish (7 %), phytobenthos (2 %) and benthic invertebrates (1 %). The four relevant biological quality elements were used for

operational monitoring of rivers in Italy: benthic invertebrates (55 % of river water bodies included in operational monitoring), phytobenthos (46 %), macrophytes (21 %) and fish (8 %). Benthic invertebrates were used to monitor 87 % of transitional water bodies included in operational monitoring, followed by phytoplankton (39 %), macroalgae (20 %), fish (19 %) and angiosperms (14 %).

Transboundary surface water body monitoring

Italy reported 23 river, four lake and eight groundwater transboundary bodies, but did not report any monitoring sites that were part of international networks.

3.1.2 Assessment and classification of ecological Status/potential of surface water

Ecological Status or potential of surface water bodies

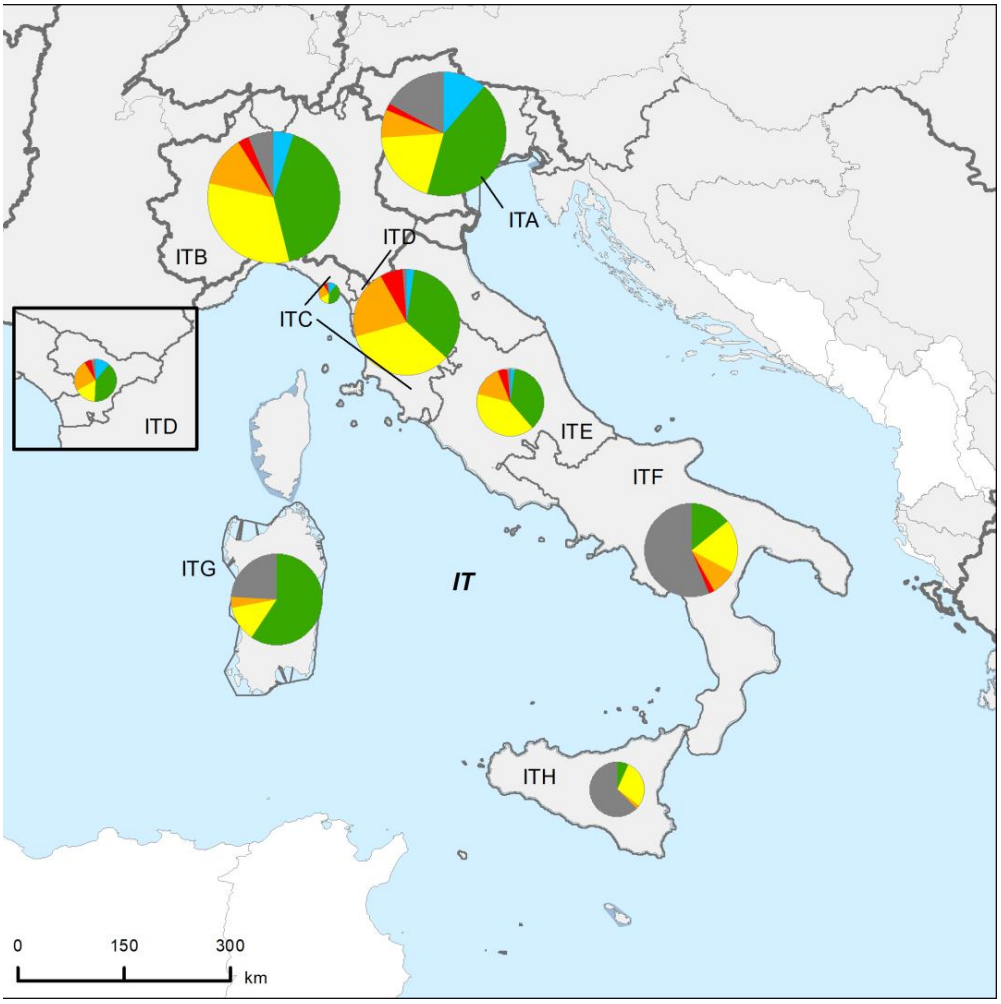
The ecological status/potential of surface water bodies in Italy in the second RBMPs is illustrated in Map 3.1.

Figure 3.3 compares the ecological status of surface water bodies in Italy for the first RBMPs with that for the second RBMPs and that expected by 2015.

Member States were asked to report the expected date for the achievement of good ecological status/potential. The information for Italy is shown in Figure 3.4.

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

Note: Standard colours based on WFD Annex V, Article 1.4.2(i).



Source: WISE, Eurostat (country borders)

High

Good

Moderate

Poor

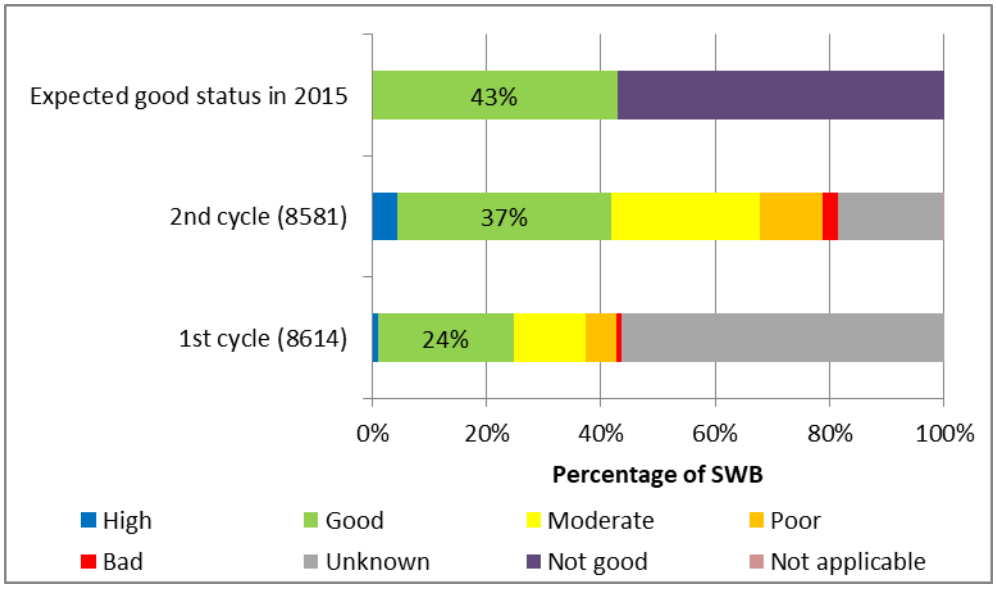
Bad

Unknown

River Basin Districts

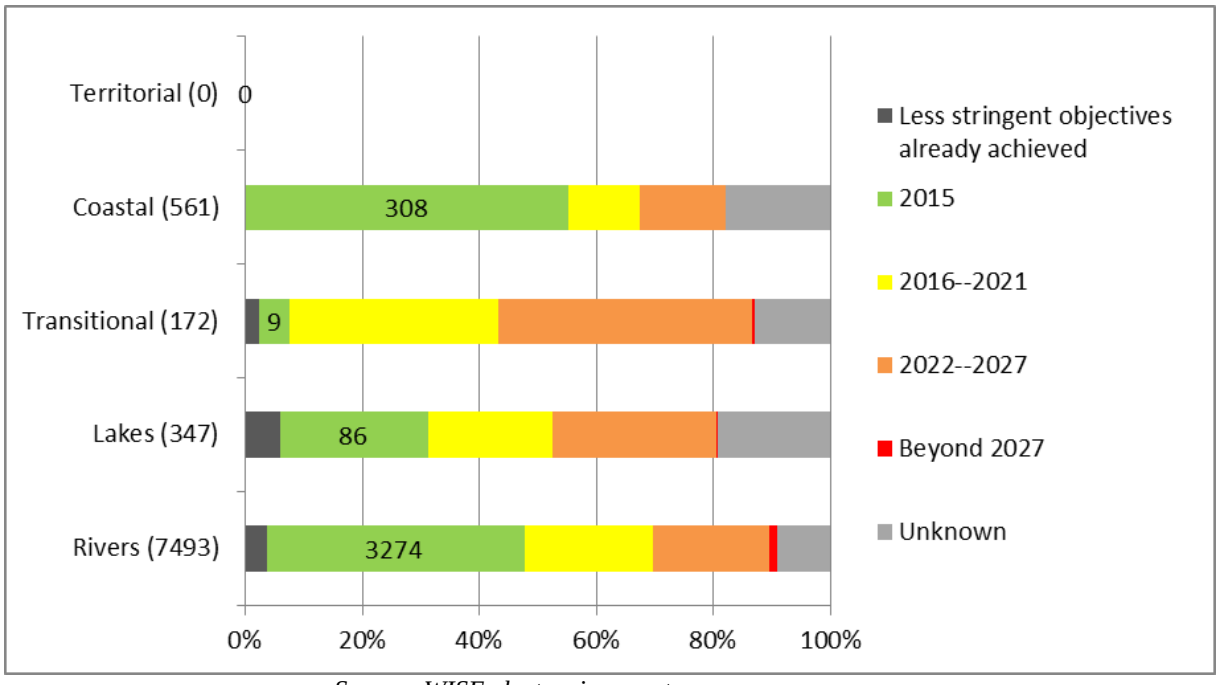
Countries outside the European Union

Figure 3.3 ***Ecological status or potential of surface water bodies in Italy for the second RBMPs, for the first RBMPs and expected in 2015. The number in parenthesis is the number of surface water bodies for each cycle. Note the period of the assessment of status for the second RBMPs was 2009 to 2015. The year of the assessment of status for first RBMPs is not known***



Source: WISE electronic reporting

Figure 3.4 ***Expected date of achievement of good ecological status/potential of surface water bodies in Italy. The number in parenthesis is the number of water bodies in each category***



Source: WISE electronic report

Ecological status/potential has been classified for the majority of water bodies, in contrast to the first RBMPs, where most of the water bodies were unclassified. The exceptions are the Sicily and Southern Apennines RBDs, where the majority of water bodies still have unknown ecological status/potential. It is not clear why there are still some natural river and lake water bodies with unknown ecological status in all RBDs.

There was an increase in the proportion of surface water bodies at good or better ecological status/potential from 25 % in the first RBMPs to 42 % in the second. There was a significant reduction in the proportion of surface water bodies with unknown status/potential from the first to the second RBMPs, from 56 % to 18 %. It should be noted that there has been a small (0.5 %) reduction in the number of surface water bodies delineated from the first to the second RBMP.

In the South Apennines and Sicily RBDs (as mentioned above) the ecological status is unknown for the majority of water bodies. This is particularly noted for artificial and heavily modified water bodies, which is explained in Annex 0 as being due to lack of methods to assess ecological potential. However, for natural water bodies, the proportion with unknown status is also important in those RBDs.

Ecological status/potential is less than good for 65 % of lakes, 50 % of rivers and 95 % of transitional waters.[36] By contrast, only 25 % of coastal waters are in less than good ecological status. This is in line with the exemptions, except in the South Apennines and Sardinia RBDs, where the expected date for achieving the objectives is unknown for a large proportion of water bodies.

The overview report for the Padan RBD states that in the second RBMP, in comparison with the first RBMP, "for the first time, an overview of the ecological status and chemical status of all surface water bodies is provided". This statement suggests that a comparison of ecological status/potential with the first RBMP would be at best limited as information was not available for all surface water bodies at the time. An annex to the main RBMP provides an overview of current ecological status. However, only a preliminary analysis of the changes with respect to the first RBMP was presented.

For the South Apennines RBD, the RBMP provides an overview of the ecological status by region. For a few regions and water body types, comparisons are made with the first RBMP: for example, in Puglia, 16 % of transitional waters were reported to have seen an improvement

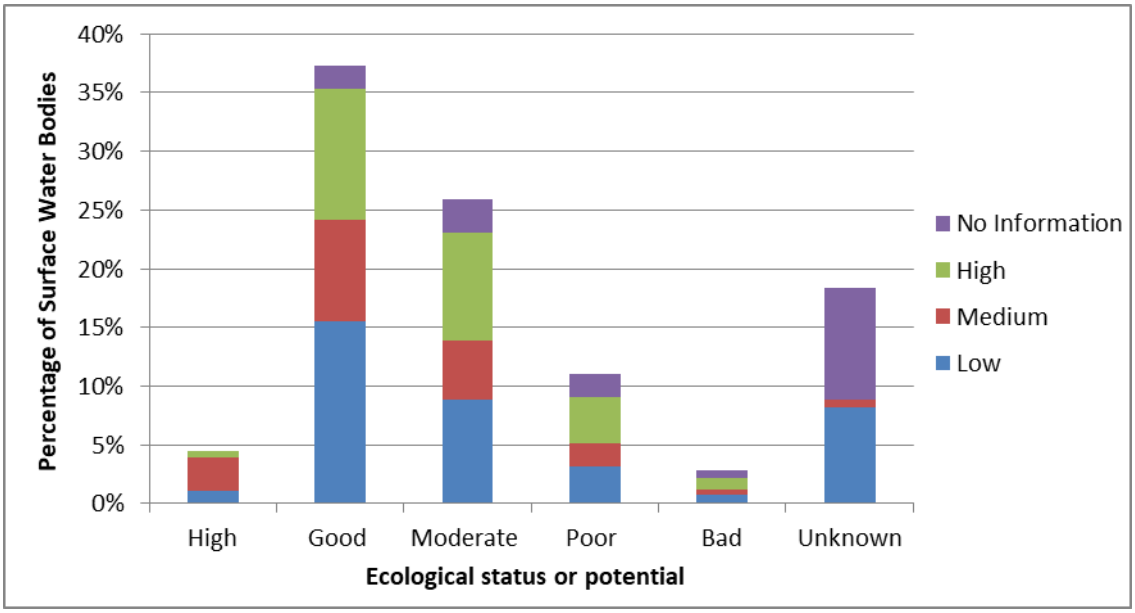
[36] See “European waters - Assessment of status and pressures 2018”, https://www.eea.europa.eu/publications/state-of-water

in ecological status and 17 % saw a decline, with the rest not changing; in Lazio, 3 % of river water bodies saw an improvement in ecological status, 33 % a decline, 31 % were stationary, and 33 % were not monitored for the first RBMP.

Confidence in ecological status assessment

Figure 3.5 shows the confidence in the classification of ecological status/potential.

Figure 3.5 Confidence in the classification of ecological status or potential of surface water bodies in Italy



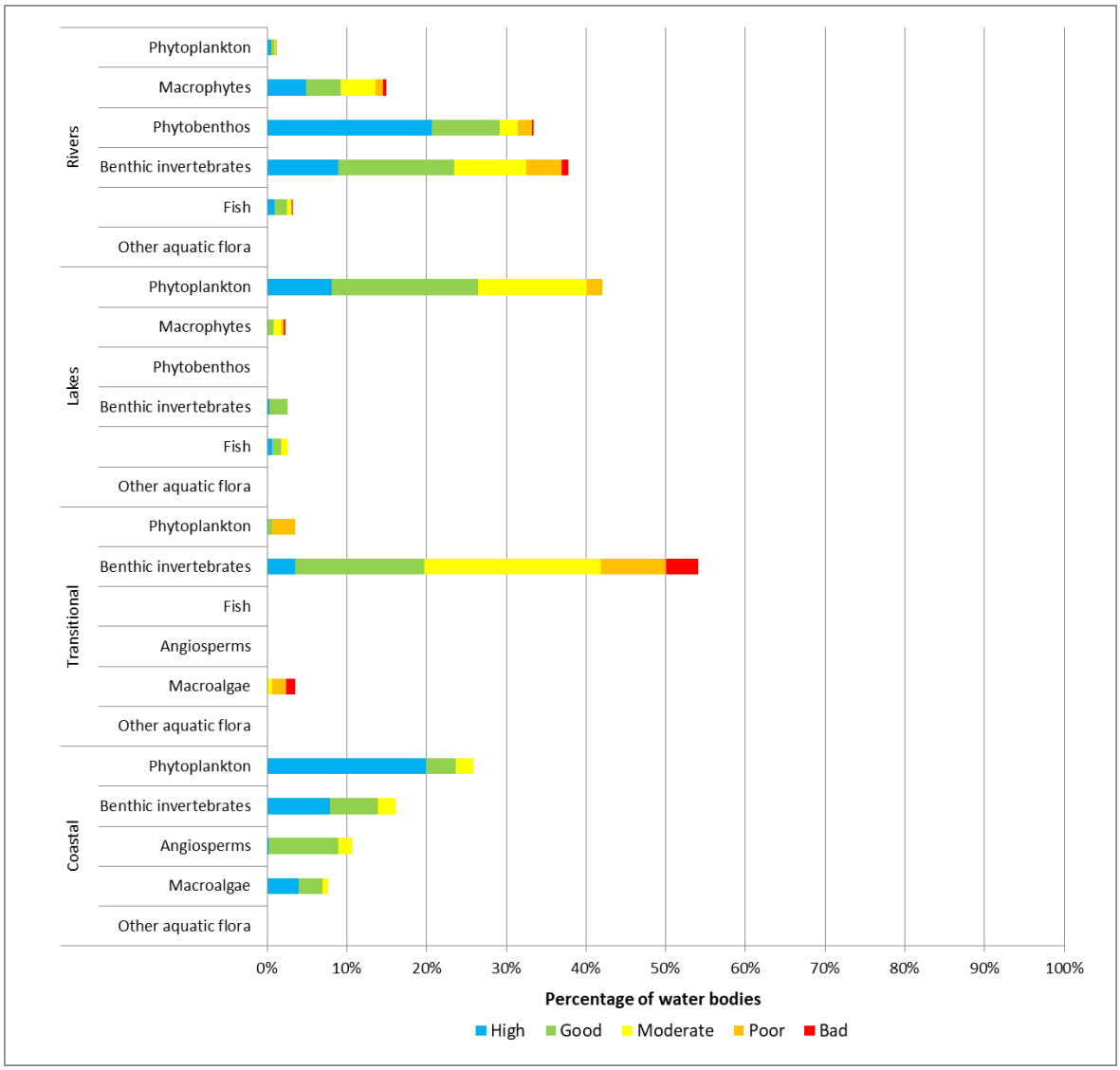
Source: WISE electronic report

There was a significant improvement in the confidence in the classification of the ecological status/potential of surface water bodies in Italy from the first to the second RBMP. 1 % of water bodies were classified with high confidence for the first RBMPs and 26 % for the second. This was due to more monitoring and assessment of biological quality elements

Classification of ecological status in terms of each classified quality element

Figure 3.6 shows the percentage of water bodies in terms of the biological quality element used for classification.

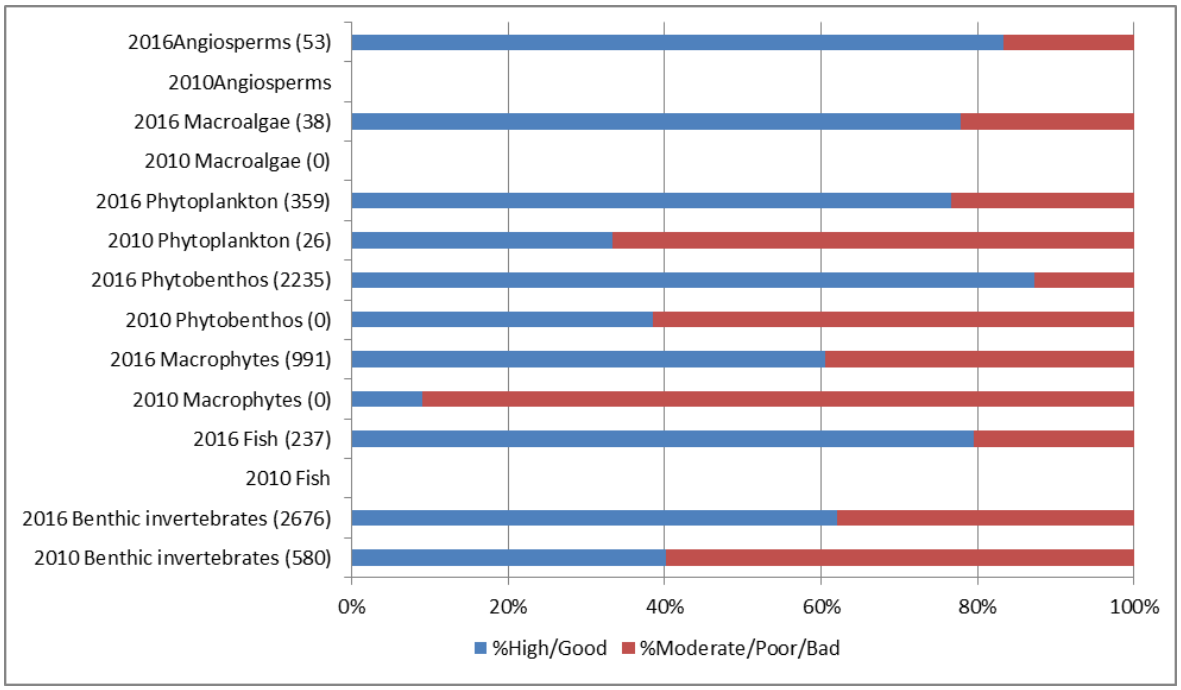
Figure 3.6 Ecological status/potential of the biological quality elements used in the classification of lakes and rivers in Italy. Note that water bodies with unknown status/potential, and those that are monitored but not classified or not applicable, are not presented.



Source: WISE electronic reporting

Figure 3.7 compares the classification of biological quality elements in terms of ecological status/potential for the first and second RBMPs. It should be noted that this comparison should be treated with 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 Italy according to classified biological quality elements in rivers and lakes from the first to the second RBMP. The numbers in parentheses are the numbers of surface water bodies with a classification for that element



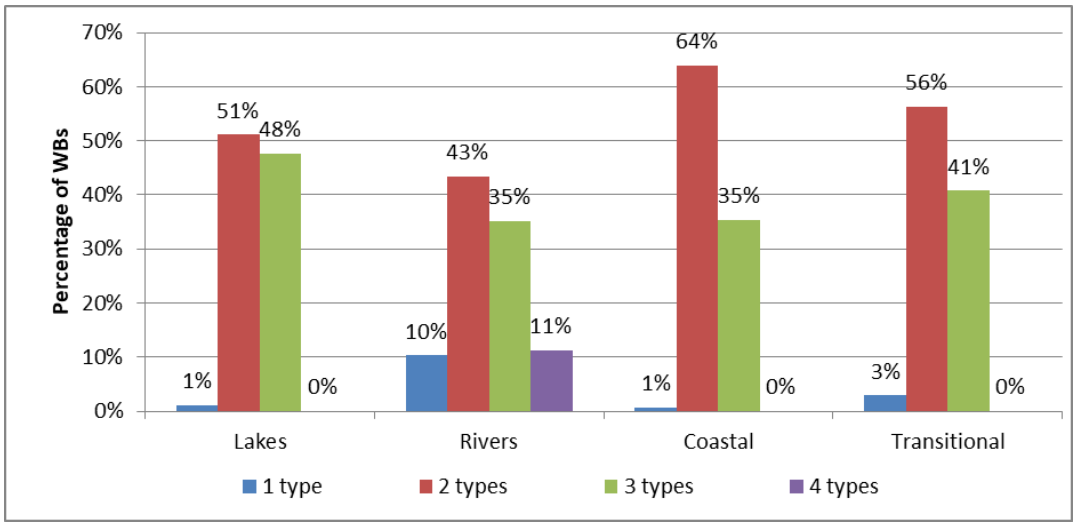
Source: WISE electronic reporting

Figure 3.8 illustrates the basis of the classification of ecological status/potential of surface water bodies in Italy for the second RBMPs.

Several biological quality elements were reported as unknown status/potential or not applicable in the large majority of water bodies, for example, macroalgae and angiosperms in coastal waters, all biological quality elements except phytoplankton in lakes, macrophytes and fish in rivers, and all biological quality elements except benthic invertebrates in transitional waters.

The change in status/potential at the quality element level is unknown for most water bodies and most quality elements. Almost all the changes which were reported are due to changes in monitoring and/or assessment systems, and only very few were reported as consistent changes.

Figure 3.8 ***The classification of the ecological status or potential of rivers and lakes in Italy using 1, 2, 3 or 4 types of quality element. Note: The four types are: biological; hydromorphological, general physicochemical and River Basin Specific Pollutants***



Source: Extracted from WISE

Assessment methods for the biological quality elements

Assessment methods have been developed for all biological quality elements in all water categories except for fish in transitional waters and phytobenthos in lakes.

The sensitivity of several of the biological quality element methods to different impacts was reported, and appears to be rather general, ranging across most impacts.

Annex 1 to the RBMP for the Padan RBD states that judgements on ecological status for some water bodies may change as not all biological quality elements have been used; it is further noted that a process of validation is still under development for a few biological quality elements, in particular for fish in rivers.

Intercalibration of biological quality element methods

Some river types overlap several of the common intercalibration types, therefore it is not clear which of the intercalibrated class boundaries are used for classification of water bodies in those national types[37].

[37] Italy subsequently stated that in the Ministerial Decree 260/2010 there are tables showing the links between national and common IC types.

The Annex to the RBMP for the Padan RBD states that the analysis of ecological status was based on the biological quality elements set out in Decision 2008/915/EC[38], but not those in Decision 2013/480/EU - these will be addressed in the next RBMP.

Assessment of hydromorphological quality elements

The relevant hydromorphological quality elements are assessed in terms of ecological status/potential in all water categories but the classification boundaries for all of the elements in all categories are not related to the class boundaries for the sensitive biological quality elements.

Hydrological conditions (for example, flow levels) are not used for classification (except for 5 % of rivers in the Eastern Alps RBD). Classification of the other hydromorphological quality elements is not carried out in any water category, except morphological conditions in 13 % of the river water bodies in the Padan RBD and 28 % of the river water bodies in the Eastern Alps RBD, and river continuity and morphology in most of the rivers in the Sardinia RBD. These quality elements are not used at all in the South Apennines and Sicily RBDs.

Annex 1 of the second RBMP for the Padan RBD indicates that in 2009 and 2010, monitoring protocols were established in all regions in the RBD for ecological status monitoring, including hydromorphological quality elements. The Annex refers to the use of the IDRAIM system, developed by ISPRA, and the IQM index, as well as other indices (IARI, IQH): these indices are referenced in Ministerial Decree 260/2010.

The RBMP for the South Apennines RBD contains little information on hydromorphological quality elements; it is explicitly stated that they were monitored in some regions (for example, for river water bodies in Campania), while for others they are not mentioned at all.

The second RBMPs do not explain the changes relative to the first RBMPs. However, the assessment of the first RBMPs indicated that, while hydromorphological quality elements were established in the 2009 decree, they had not been used. Consequently, these quality elements are extensively used for the first time for the second RBMPs.

Annex 1 of the RBMP for the Padan RBD notes that hydromorphological quality elements are assessed on the basis of common hydromorphological methods. However it is noted that in some specific conditions, the methods do not provide reliable results as further validation and

[38] Commission Decision 2008/915/EC, of 30 October 2008 establishing, pursuant to Directive 2000/60/EC of the European Parliament and of the Council, the values of the Member State monitoring system classifications as a result of the intercalibration exercise, https://eur-lex.europa.eu/eli/dec/2008/915/oj

calibration needed. The Annex indicates that several administrative areas in the RBD did not use hydromorphological quality elements: Valle d'Aosta Region, Veneto Region and Trento Autonomous Province (it is not clear if this is because the methods were not considered reliable for their conditions). Specific details with regard to which methods and quality elements need further validation and calibration were not provided.

Italy subsequently clarified that this is only the case for regulated rivers, but that in the general cases the methods are considered to be reliable. Italy subsequently clarified that the reason was in some cases a lack of data, and in some cases that the information was not reported.

Classification methods for general physicochemical quality elements

The relevant general physicochemical quality elements are assessed in terms of ecological status/potential in all water categories (except for acidification status in transitional and coastal waters).

Common standards were reported for all types of water bodies in all water categories for oxygenation conditions and nutrient conditions. For lakes, the standards are set on the basis of a trophic state index and are likely to be consistent with the good-moderate boundaries for sensitive biological quality elements. For rivers, the index used is based on different parameters, for which standards have not been set to be individually related to the biological response for each class, but that are used in combination as indicator of water quality and as a distance to an expected condition. Italy subsequently clarified that they are currently checking the consistency between the physico-chemical quality element boundaries and the sensitive biological quality elements boundaries for lakes, rivers, coastal and transitional waters.

The national decree specifying technical methods related to ecological status (Ministerial Decree 260/2010) sets out status levels for physicochemical standards. It contains tables that intersect between the results of the physicochemical standards and those of the biological quality elements to identify ecological status. A more detailed analysis of the different methods is presented below.

The LIMeco multimetric index is used for rivers and consists of the following physicochemical parameters: oxygen, ammonium, nitrate and total phosphorus. In Ministerial Decree 260/2010, class boundaries are given for each parameter, as well as for the combined multimetric. The Good-Moderate status boundary (standard) for total phosphorus is 100 µg/l, which is close to the saturation level for nutrient sensitive biology, such as phytobenthos. The class boundaries for all the four parameters represent a mathematical doubling of the value for each class (for example, for total phosphorus 50 µg/l for the High-Good status boundary to 100 µg/l for Good-

Moderate status to 200 µg/l for Moderate-Poor status and 400 µg/l for Poor-Bad status), which is very unlikely to be related to the biological responses. The points scored for each of the single parameters are combined into the overall LIMeco value (ranging from High-Good = 0.66, Good-Moderate = 0.50, Moderate-Poor = 0.33 and Poor-Bad = 0.17). This value appears to be a mean value, but it is unclear whether each of the four parameters is given an equal weighting or whether the limiting nutrient is assigned a higher weighting than the others. Italy subsequently clarified that the boundary between High and Good status has been fixed in correspondence to the 10th percentile observed at reference samples and the remaining range cut into equal ranges for the other categories.

The LTLeco index is used for lakes to assess the trophic state in relation to ecological status. It has three parameters - total phosphorus, transparency and dissolved oxygen - each parameter having High-Good and Good-Moderate boundaries, which are different for two major groups of lake types: one group includes the national lake types L1, L2, I1, I2, whereas the second group includes the types L3, L4, I3, I4, the latter having higher boundary values for total phosphorus, with Good-Moderate boundary of 15 µg/l for the first group and 20 µg/l for the second group. The reference values are also given. The Good-Moderate boundaries are quite low and are probably well aligned with the Good-Moderate boundaries for phytoplankton in lakes, according to the relevant intercalibration technical report. The Good-Moderate boundaries given for the transparency and oxygen parameters also seem relevant in terms of relationship with nutrient sensitive biology. The calculation used to derive the combined LTLeco metric value is unclear, but seems to be the sum of the points given for each parameter depending on the class achieved for each parameter.

The TRIX index is used for coastal and marine waters. While it is referenced in Ministerial Decree 260/2010, the decree does not specify the boundaries for its parameters. A separate ISPRA report on water monitoring explains that TRIX is based on: chlorophyll, the concentration of macronutrients (dissolved inorganic nitrogen and phosphorus), and dissolved oxygen (percentage of saturation compared to 100 %). This report also underlines that TRIX supports the assessments based on EQS: if the TRIX result is higher than the EQS result, then the EQS result is used; however, if the TRIX result is lower than the EQS result, then the TRIX result is used. The report also suggests that, based on the experience so far, this approach should be reconsidered when such mismatches are observed, as then further monitoring should be carried out. A definitive set of class boundaries for the TRIX parameters was not found (a set of boundaries was found in a 2002 paper prepared by ISPRA, but it is likely that these have since been modified as the paper was prepared before Italy's transposition of the WFD).

Selection of River Basin Specific Pollutants and use of environmental quality standards

National legislation (Ministerial Decree 260/2010) sets out a list of pollutants to be considered as specific pollutants (according to Annex 1 to the RBMP for the Padan RBD). The list of pollutants given in the decree includes 51 substances, which are mainly organic micropollutants, as well as some pesticides, but no metals except arsenic[39]. A review of the Ministerial Decree 260/2010 indicates that monitoring is obligatory for a substance if significant quantities (defined as quantities that could compromise the achievement of WFD objectives) are discharged or released in the river basin or sub-basins, or are identified there; the choice of River Basin Specific Pollutants to be included in surveillance monitoring should be carried out on the basis of the pressures and impacts present.

Standards were reported for 110 River Basin Specific Pollutants excluding those reported under schema element" RBSP-Other (see above explanation of why these "other" substances could not be included in the assessment). Standards were reported for 27 substances in sediment and 89 in water. It was reported that none of the environmental quality standards[40] has been derived in accordance with the Technical Guidance Document No 27[41]. The analytical methods used for the substances are reported to be in line with either Article 4(1) or Article 4(2) of Directive (2009/90/EC)[42].

Another 199 River Basin Specific Pollutants were monitored in water but had no Environmental Quality Standards established and the same applies to 41 River Basin Specific Pollutants monitored in sediment. All the River Basin Specific Pollutants for which Environmental Quality Standards have been established are monitored.

A long list of River Basin Specific Pollutants was reported in each RBD along with the number of water bodies failing for each substance. Only a few water bodies were reported to exceed the Environmental Quality Standard values, except in the Padan RBD, where about 23 % of water bodies were failing good status for River Basin Specific Pollutants, mainly due to arsenic, chromium and pesticides.

[39] Italy subsequently stated that chromium is also included in the list.

[40] Italy subsequently stated that several environmental quality standards have been derived according to the Technical Guidance Document No 27, but this was not reported nor described explicitly in the RBMPs.

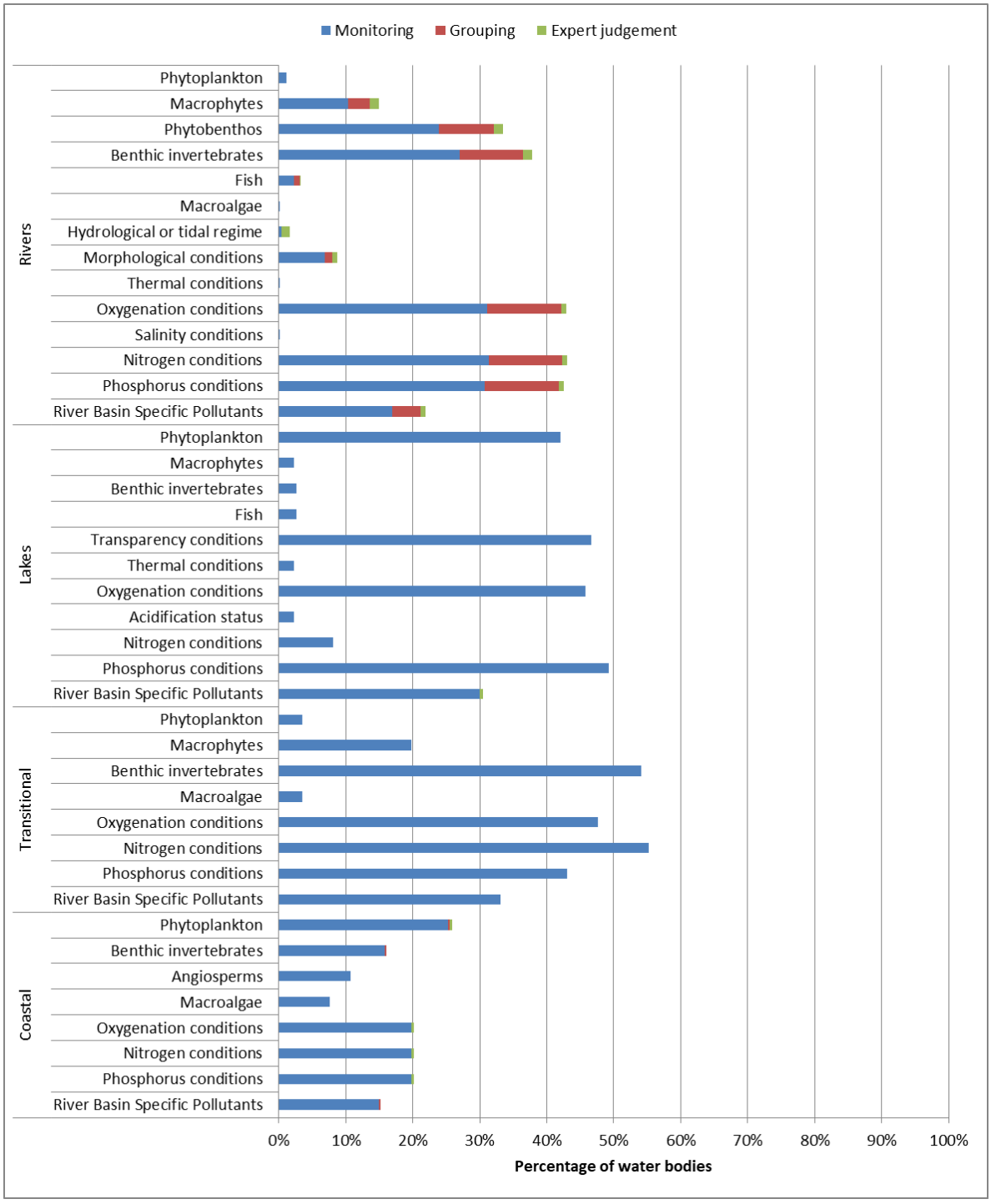
[41] https://circabc.europa.eu/sd/a/0cc3581b-5f65-4b6f-91c6-433a1e947838/TGD-EQS%20CIS-WFD%2027%20EC%202011.pdf

[42] 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

Use of monitoring results for classification

The classification of the individual quality elements is illustrated in Figure 3.9.

Figure 3.9 Basis of the classification of ecological status/potential in Italy. The percentages are in terms of all waterbodies in each category.



Source: WISE electronic reporting

Coastal water bodies were classified by four biological quality elements (mainly phytoplankton), oxygenation, nutrient conditions and River Basin Specific Pollutants, largely using monitoring results. More water bodies were directly monitored for the biological quality elements than were subsequently classified. Several coastal water bodies were monitored for morphological conditions but this element was not used in the classification.

The classification of the biological quality elements in lakes is almost solely based on phytoplankton though macrophytes, benthic invertebrates and fish are used for a small number of lakes. The classification was only based on monitoring results and more lakes were directly monitored than were subsequently classified. A few lakes were monitored for hydromorphological quality elements but these elements were not used in the classification. Physicochemical quality elements and River Basin Specific Pollutants were also used in the classification of lakes.

All relevant biological quality elements were used in the classification of river water bodies in Italy. Whilst the results of monitoring were primarily used in the classification, grouping and expert judgment were also used. More river water bodies were monitored for the biological quality elements than were subsequently classified using monitoring results, perhaps indicating a lack of confidence in the monitoring and assessment system for the biological quality elements. Hydrological regime and morphological conditions were used in the classification of rivers using monitoring results, expert judgment and grouping. Continuity was also monitored in a few river water bodies but not used in the classification. Also more river water bodies were directly monitored for hydromorphological quality elements than were subsequently classified using monitoring results. Physicochemical quality elements and River Basin Specific Pollutants were also used in the classification of rivers.

Benthic invertebrates and macrophytes were reported to be the main biological quality elements used in the classification of transitional waters (although macrophytes are generally associated with rivers and lakes), though phytoplankton and macroalgae were used for a small number of transitional water bodies. The classification was solely based on monitoring results, though more water bodies were directly monitored for the biological quality elements than were subsequently classified. Morphological conditions were monitored in transitional waters but not used in the classification. Oxygenation, nutrient conditions and River Basin Specific Pollutants were used in the classification of transitional water bodies solely based on monitoring results.

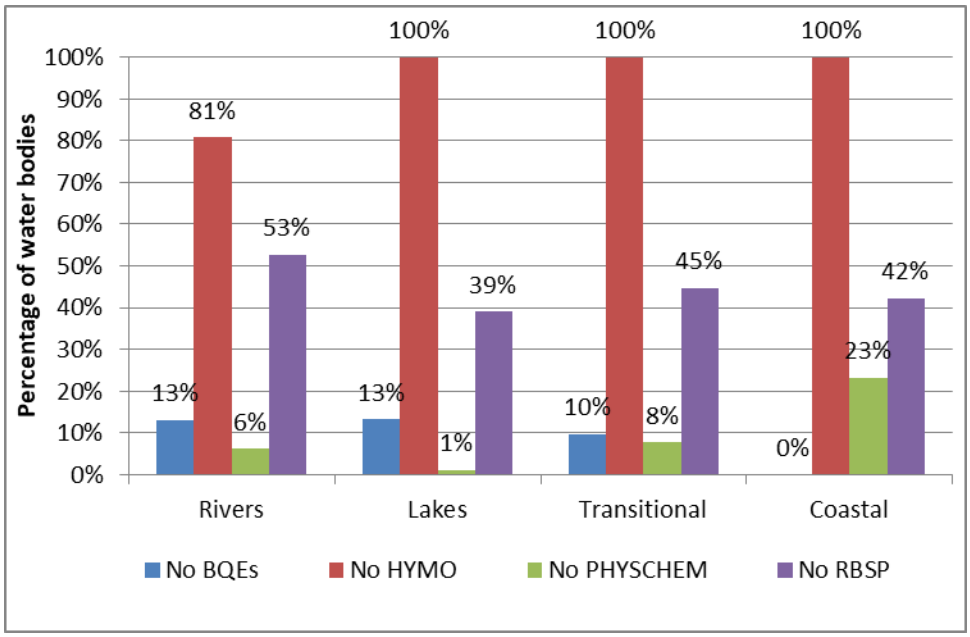
In most RBDs, several biological quality elements and supporting physicochemical quality elements were monitored and classified in some water bodies. Hydrological regime, however,

is ignored in most RBDs and water categories, and very few water bodies were monitored and classified for fish, in spite of assessment methods being available.

Overall classification of ecological status

Figure 3.10 illustrates the basis of the classification of ecological status/potential of rivers and lakes in Italy for the second RBMPs.

Figure 3.10 ***The percentage of river and lake water bodies in Italy 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: Member State reporting to WISE

Italy reported that the one-out, all-out principle has been used in all RBDs, but the details on combination rules applied for the biological quality elements versus the supporting quality elements are not clear[43].

3.2 Main changes in implementation and compliance since the first RBMPs

Information is only available from six RBDs (Eastern Alps, Padan, North Apennines, Serchio, Central Apennines and South Apennines) on the monitoring sites reported in the first

[43] Italy subsequently stated that they applied the rules described in the CIS Guidance n°13.

RBMPs.[44] Overall in these six RBDs there were significant increases in the number of sites in each water category from the first to the second RBMPs. There was a 45 % increase in river surveillance sites though there was a decrease in numbers in the North Apennines and Serchio RBDs. The decreases in site numbers for these two RBDs affected all water categories.

In those six RBDs, 12 % of surface water bodies were included in surveillance monitoring and 10 % in operational. In the same six RBDs, for the second RBMPs, 25 % of surface water bodies were included in surveillance and 22 % in operational. There were also increased proportions for the second RBMPs for the four water categories, and for surveillance and operational monitoring.

Ecological status has been classified for the large majority of water bodies, in contrast to the first RBMPs, where a very large proportion of water bodies were unclassified. The biological quality element methods have been reported to be developed for all relevant biological quality elements in all water categories, except for fish in transitional waters and phytobenthos in lakes[45].

3.3 Progress with Commission recommendations

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

- Recommendation: *Where there are currently high uncertainties in the characterisation of the RBDs, identification of pressures, and assessment of status, these need to be addressed in the current cycle, to ensure that adequate measures can be put in place before the next cycle*

  Assessment: There have been significant reductions in the level of uncertainties in the assessment of status resulting from improvements in monitoring and the development of assessment methods for all relevant biological quality elements. The reduction of uncertainty is evidenced by significant reductions in the number of water bodies with unknown status/potential and an increase in the number of water bodies classified with high or medium confidence.

[44] Italy subsequently stated that information for Sardinia RBD in the first RBMP is available at the following link : http://www.regione.sardegna.it/index.php?xsl=509&s=1&v=9&c=10456&tb=6695&st=7&tb=6695&st=7

[45] Italy subsequently stated that methods have been developed for each biological quality element in all water categories and these results are published in the Commission Decision 2018/229 which therefore includes methods for fish in transitional waters and for phytobenthos in lakes.

The recommendation has been partially fulfilled.

- Recommendation: *The high percentage of water bodies that have an unknown status prevents effective planning and comparability with other Member States. WFD compliant assessment methods should be used taking into account the work on intercalibration.*

- Recommendation: *Complete the development of methods for the status assessment of water bodies and apply them through the implementation of robust monitoring programmes.*

  Assessment: Ecological status has now been classified for the large majority of water bodies, in contrast to the first RBMPs, where a very large proportion of water bodies were unclassified: for Italy as a whole, the proportion of unclassified water bodies has decreased from 50 % in the first RBMPs to 18 % in the second RBMPs for rivers and lakes and from 90 % to 27 % for coastal and transitional waters.

  The biological quality element methods (reference conditions, class boundaries) have been developed and intercalibrated for all relevant biological quality elements in all types and all water categories. This is a major improvement with respect to the first RBMPs.

  The confidence in classification of ecological status has improved for rivers from around 25 % of all classified water bodies in medium or high confidence in the first RBMPs to 50 % in the second RBMPs. The confidence in classification is high or medium for 80-90 % of classified lakes and transitional waters bodies.

  The recommendation has been partially fulfilled.

- Recommendation: *Monitoring is an important part of river basin planning and affects the quality and effectiveness of subsequent steps. The current monitoring gaps for BQEs, supporting quality elements and priority substances should be addressed.*

  Assessment: In its reporting of the first RBMPs, Italy did not indicate any monitoring sites for two RBDs (the Sardinia and Sicily RBDs) and only a few for the South Apennines RBD; moreover, different information, including some details for these three RBDs, had been reported previously to the Commission.

The South Apennines RBD and the Sardinia RBD have now reported monitoring sites for all four water categories. However, the Sardinia RBD did not report surveillance sites for lakes and transitional waters. The Sicily RBD reported monitoring sites but did not indicate whether they were for surveillance or operational purposes, only whether they were for ecological and/or chemical status monitoring.

There has therefore been some progress on this aspect. However, there are still significant gaps in the monitoring programmes for the second RBMPs. For example, no surveillance monitoring was undertaken in five of the seven RBDs for transitional waters and in three of the seven RBDs for coastal waters. In addition, lakes were not included in surveillance monitoring in one of the seven RBDs. Macrophytes were monitored in lakes in only three RBDs, phytobenthos in two, benthic invertebrates in two and fish in three RBDs. Only in one RBD (Eastern Alps RBD) are all the expected biological quality elements monitored in lakes.

There are also significant gaps in the monitoring of hydromorphological quality elements. Only two RBDs (Eastern Alps RBD and the Padan RBD) monitor morphological conditions in coastal waters and tidal regime is not monitored in any RBD[46]. In transitional waters the only hydromorphological quality element monitored is morphological conditions in three of the eight RBDs (Eastern Alps, Padan and North Apennines)[47]. Hydrological regime is only monitored in lakes in one RBD (Padan RBD) and morphological conditions only in one RBD (Central Apennines). In only one RBD (Sardinia) are all three required hydromorphological quality elements monitored in rivers.

Status has been monitored and classified for at least two biological quality elements in the majority of rivers and coastal waters, including fish in a few river water bodies. Physicochemical quality elements (mainly oxygen and nutrients) are also classified in most water bodies in most RBDs. Monitoring is the basis for classification for most of the water bodies classified for the biological quality elements.

Progress has been made but this recommendation is considered as partially fulfilled.

[46] Italy subsequently stated that tidal regime is monitored in coastal waters in the Eastern Alps RBD.
[47] Italy subsequently stated that hydrological or tidal regime is also monitored in transitional waters in the Eastern Alps RBD.

- 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, and where there are exceedances how such exceedances have been taken into account in the assessment of ecological status.*

  Assessment: Though some information was found in RBMPs on River Basin Specific Pollutants, the information was unclear on how specific substances were selected. At least 289 chemical substances that are not Priority Substances or Certain Other Pollutants, and were therefore assumed to be River Basin Specific Pollutants, were reported to be monitored in Italy, covering all eight RBDs and all four water categories. However, there are issues relating to the reporting of this information to WISE and it is unclear how many River Basin Specific Pollutants have actually been monitored. A long list of River Basin Specific Pollutants was reported along with the number of water bodies failing for each RBD.

  Environmental Quality Standards were reported for 110 River Basin Specific Pollutants. However, it has been reported that the CIS technical guidance n°27 has not been used to set any of them. Italy subsequently stated that it was the case for some substances even though it was not reported. The analytical methods were reported to be in line with Article 4(1) of Directive 2009/90/EC[48] for most substances, while for the remaining ones (mainly pesticides), the analytical methods were reported to be in line with Article 4(2) of the same Directive.

  Overall, progress has been made and the recommendation has been partially fulfilled.

- Recommendation: *Quantitative aspects for surface and groundwater should be properly taken into account during the monitoring and assessment phases.*

  Assessment: The hydrological regime of rivers was only reported to be monitored in four RBDs, and for lakes in one RBD. If this is indicative of monitoring of river flows, then there are significant gaps in the monitoring of the flow of rivers in Italy. Hydrological regime was used in the classification of rivers in two RBDs, though expert judgement was used for more water bodies than the results of monitoring. This again indicates some potential weaknesses in the assessment methods for this element.

[48] 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

There has been some progress on this aspect but it is likely that there are still significant gaps. Bearing in mind these gaps, the 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.

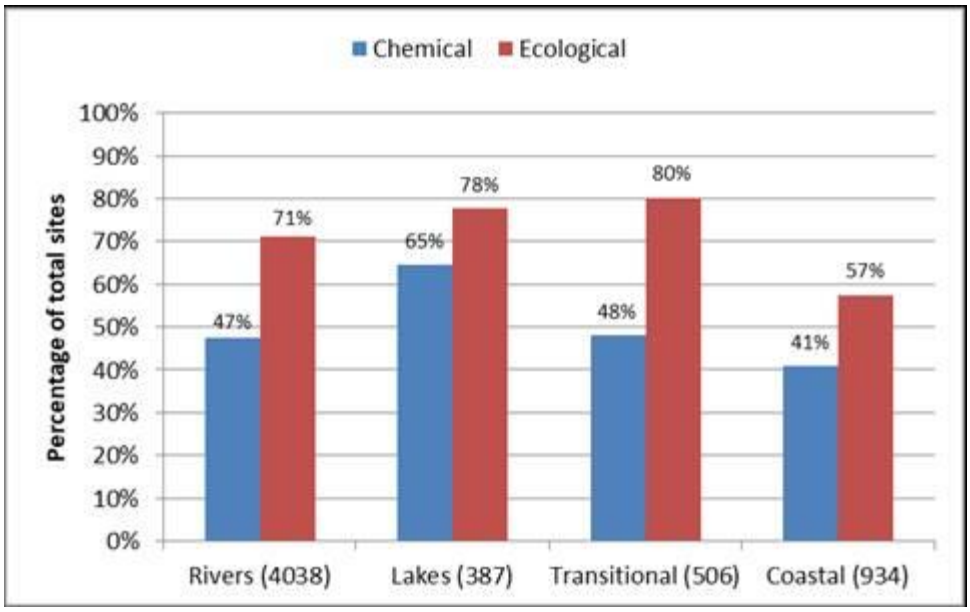
Surveillance monitoring programmes should allow Member States to supplement and validate the impact assessment procedure, to efficiently and effectively review the design of their monitoring programmes, and to assess the long-term changes in natural conditions and those resulting from widespread anthropogenic 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 Italy 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. Data on chemical status of territorial waters are not reported. Italy mentioned that their status has been assessed under the MSFD, but it is unclear whether this assessment was based on exactly the same criteria as the ones required for the WFD. For the purposes of 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[49].

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

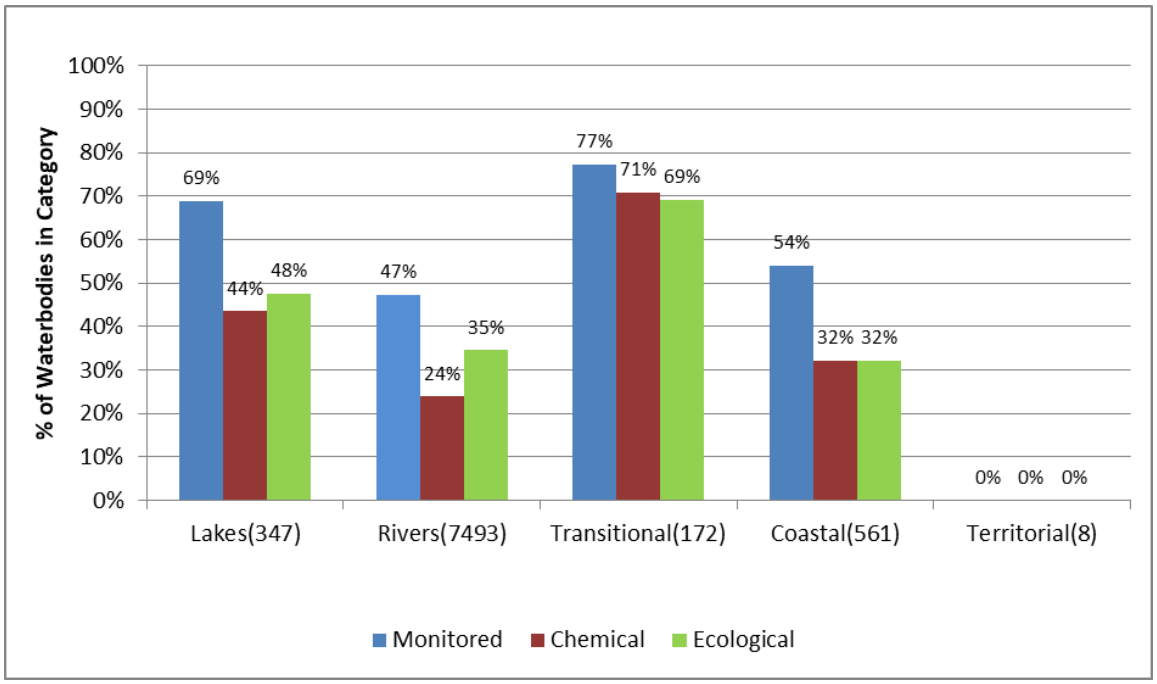
Figure 4.1 ***Proportion of sites used for monitoring of chemical status and, for comparison, ecological status, in Italy. The number in parenthesis next to the category is the total number of monitoring sites irrespective of their purpose***



Source: WISE electronic reporting

Figure 4.2 summarises the proportion of water bodies monitored for chemical status in lakes and rivers 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 purposes, those for ecological status. Figure 4.2 shows that almost two thirds of all lake water bodies are used for monitoring chemical status and just under half of river and transitional water bodies are used. Of the coastal water bodies, 41 % were monitored for chemical status. No monitoring of territorial water bodies was reported. Comparatively more water bodies were monitored for ecological status.

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



Source: WISE electronic reporting

As part of the operational monitoring programme, 59 % of the water bodies failing to achieve good chemical status were reported to be monitored in Italy as a whole. For individual RBDs this percentage varies between 40 % and 50 % for RBDs the North Apennines, Serchio and South Apennines RBDs; between 59 % and 72 % for the Padan and Sardinia RBDs; and between 86 and 95 % for the Eastern Alps, the Central Apennines and Sicily RBDs. In terms of water body categories, 50 % of river and 72 % of coastal water failing to achieve good chemical status in Italy as a whole were monitored. In contrast 89 % of transitional and 91 % of lake water bodies failing to achieve good chemical status were monitored.

Long-term trend monitoring and monitoring of Priority substances in water, sediment and biota for status assessment

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

Monitoring was reported for 40 priority substances in water at the site level in the Eastern Alps RBD, 41 substances for the Padan, North Apennines and the Central Apennines RBDs, 35 substances for the Serchio RBD, 39 substances for the South Apennines RBD, 38 substances for the Sardinia RBD and 32 substances for the Sicily RBD.

Priority substances monitored in the territorial water bodies in Italy are not reported. More than 10 priority substances were monitored in all coastal water bodies in four RBDs (Eastern Alps, Padan, North Apennines and Serchio) and 88 % of coastal water bodies in the Central Apennines RBD. However, between 20 and 27 % of coastal water bodies in the South Apennines, Sardinia and Sicily RBDs were monitored for 10 or more priority substances with the remainder not monitored for any. Between 50 and 60 % of lake water bodies in the Eastern Alps, Padan and Serchio RBDs were not monitored for any priority substances[50]. This was the case for 22 % of lake water bodies in the Central Apennines RBD and between 81 and 85 % of lake water bodies in the South Apennines, Sardinia and Sicily RBDs. A large proportion of the remaining lake water bodies in six out of eight RBDs were monitored for more than 10 priority substances. However, in the Padan and Sardinia RBDs there was a variation in the number of priority substances monitored in the remaining lake water bodies from 4 to more than 10. In four RBDs (Eastern Alps, Padan, North Apennines and Serchio) between 64 and 76 % of river water bodies were not monitored for any priority substances[51]. This was also the situation for 52 % of river water bodies in the Central Apennines RBD, 80 % in the Sicily RBD and 93 % in both the South Apennines and Sardinia RBDs. A high proportion of the remaining river water bodies in seven out of eight RBDs were monitored for more than 10 priority substances but in the Sardinia RBD the highest proportions of the remaining river water bodies were monitored for either 4, or six to 10 priority substances. In three RBDs (Padan, Serchio and Central Apennines) all transitional water bodies were monitored for more 10 substances. This was the case for between 70 and 82 % transitional water bodies in four RBDs (Eastern Alps, North Apennines, South Apennines and Sardinia) and 33 % in the Sicily RBD. The majority of the

[50] Italy subsequently clarified this percentage varies between 40 and 60 % in these RBDs.
[51] Italy subsequently clarified this percentages varies between 57 and 76 % in these RBDs.

remaining transitional water bodies in these five RBDs were not monitored for any priority substances.

Mercury, hexachlorobenzene and hexachlorobutadiene were monitored in biota for status assessment in 5 RBDs (Padan, North Apennines and South Apennines for all three substances, Serchio for hexachlorobenzene and hexachlorobutadiene and Central Apennines for hexachlorobenzene and mercury). According to Italy, monitoring was undertaken in from 1 to 57 sites in coastal waters in these RBDs, as well as in transitional waters in the South Apennines and Padan RBD. Italy subsequently clarified that up until 2015 Italian regulation only required the monitoring of Priority Substances in water with no specific requirement for the monitoring of biota for status assessment.

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.

Monitoring frequencies in water were reported for seven of the eight RBDs; frequencies were not reported in the Sicily RBDs. In each of these seven RBDs, monitoring frequencies of at least 12 times per year and every year in the cycle were reported for the majority of Priority Substances at some sites; these frequencies meet the recommended minimum frequencies for operational and surveillance monitoring. Conversely, there are some substances and some sites that are monitored less frequently in each RBD.

Monitoring frequencies in biota meet the once every year requirements of the Directive in each site monitored.

Italy subsequently clarified that according to Italian regulations, monitoring frequencies of chemical substances lower than 12 times per year are normally expected for specific pollutants (for which the frequency both in operational and surveillance monitoring is four times per year) and moreover allowed:

- in the operational monitoring, if justified on the basis of expert technical knowledge;

- in the surveillance monitoring, if no exceedance were found during the first monitoring cycle;

- following the implementation of Directive 2013/39/EC, for ubiquitous persistent bioaccumulative and toxic substances, provided that monitoring is representative and providing statistical references;

- for priority substances assessed in biota/sediment matrices, which should be monitored once per year;

- for biota/sediments trend analysis, requiring a triennial monitoring plan.

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[52] 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

Arrangements are reported to be in place for the long-term trend analysis in two RBDs (Eastern Alps and North Apennines) in Italy but not in three other RBDs (Central Apennines, South Apennines and Sardinia). No information is reported for the Sicily RBDs. The Padan and Serchio RBD reported to WISE that arrangements were not in place, but this was probably a reporting mistake as some monitoring for trends is reported in sediment.

Italy monitors up to 10 of the 14 Priority Substances for trend assessment in sediment and/or biota in four of the eight RBDs (Eastern Alps, Padan[53], North Apennines and Serchio); tributyltin is not monitored in the Serchio RBD. Each of the 10 substances is monitored at between 48 and 223 monitoring sites in coastal and transitional waters across all RBDs monitored. No monitoring for trend assessment is carried out in surface freshwaters.

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

[53] Italy subsequently clarified that individual measures associated with KTM14 have been reported in WISE and in the Programme of Measures to address the knowledge gaps in the Padan RBMP, including arrangements for long-term trend analysis.

Frequencies

Almost all sites for trend assessment were monitored at a frequency of at least once every three years which meets the minimum requirements of the Directive.

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 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.

In the Eastern Alps RBD, 24 Priority substances are reported to WISE as in an inventory[54]. 23 of these are discharged and monitored. Endosulfan, Chlorpyrifos and Brominated diphenylethers (congener numbers 28, 47, 99, 100, 153 and 154) were also monitored but not discharged.

In the Padan and Central Apennines RBD, 41 Priority Substances were in an inventory and 25 and eight of these were discharged, respectively. All 41 Priority Substances in the inventory, therefore including those discharged, were monitored. 41 Priority Substances were also reported in an inventory in the Sardinian RBD; however, none were reported as being discharged though 38[55] were monitored.

In the Serchio RBD, seven Priority Substances were reported in an inventory and five of these were discharged. Of the five discharged, four were monitored: cyclodiene pesticides were not monitored either as individual substances or as the group of substances. Information was not

[54] Italy subsequently clarified that 33 Priority Substances have been included in this inventory – this may have been a reporting error.

[55] Italy subsequently clarified that 41 Priority Substances have been monitored in the Sardinia RBD.

provided for Priority Substances included in inventories and discharged into three RBDs (the North Apennines, the South Apennines and Sicily).[56]

Analytical methods used meet the minimum performance

For the majority of Priority Substances in Italy, the analytical methods used meet the minimum performance criteria laid down in Article 4(1) of Directive 2009/90/EC[57] for the strictest standard applied. This was the case for all 41 priority substances in the North Apennines RBD, Serchio RBD, the South Apennines RBD and Sardinia RBDs. 11 substances in the Eastern Alps, Padan RBDs and one substance in the Eastern Alps RBD were reported not to have met the criteria in Article 4(1) but the analytical methods were reported to comply with the requirements laid down in Article 4(2) of the Directive 2009/90/EC (best available techniques not exceeding excessive costs were used).

The Central Apennines RBD reported partial reporting to WISE due to lack of data. The Sicily RBD indicated that confirmation of whether the analytical methods used met the required criteria was awaited from the laboratories.

The method of dealing with measurements of priority substances lower than the limit of quantification was reported to be as specified in Article 5 of the Directive 2009/90/EC for all eight RBDs for Italy.

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. The majority of chemical status assessments were carried out in years between 2009 and 2014 (70 % of water bodies) with the rest of the assessments being carried out during either 2014 or 2015.

The chemical status of surface water bodies in Italy for the second RBMP is illustrated in Map 4.1. This is based on the most recent assessment of status. For Italy overall, 72 % of water

[56] Italy subsequently clarified that, although inventories for these RBDs had not been reported with the RBMPs, they had been reported to the Commission under the requirements of Directive 2008/105/EU. The inventories were uploaded to the EEA's Central Data Repository in envelopes under the 2010 WFD reporting.

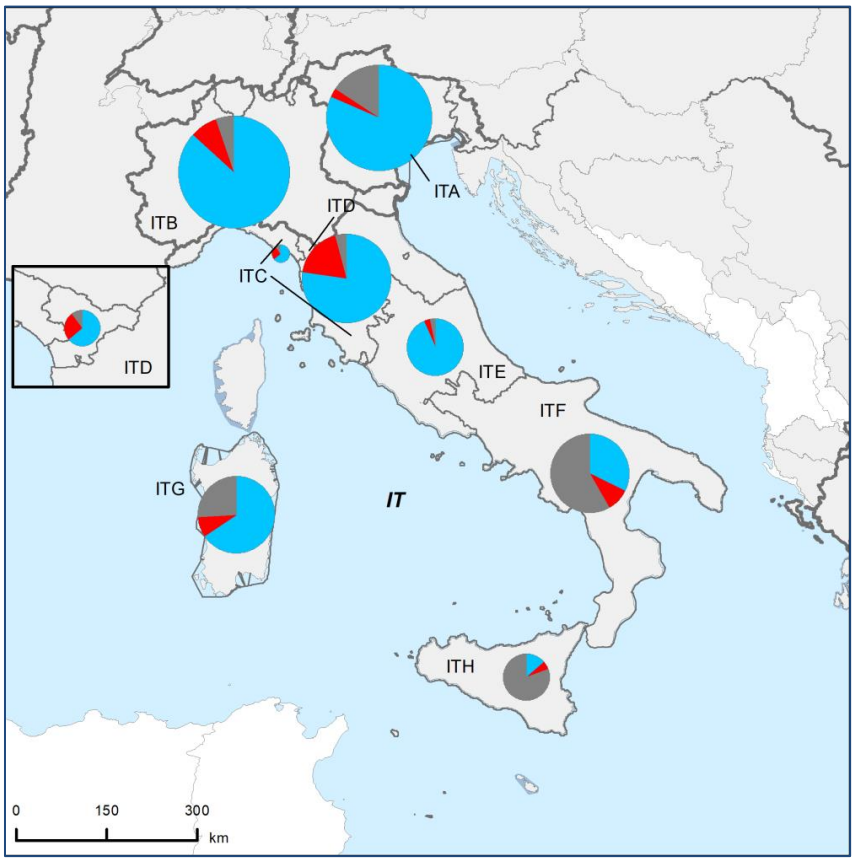
[57] Directive 2009/90/EC of 31 July 2009 laying down, pursuant to Directive 2000/60/EC of the European Parliament and of the Council, technical specifications for chemical analysis and monitoring of water status http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1524565750309&uri=CELEX:32009L0090

bodies are at good status, around 8 % are failing to achieve good status and 20 % are at unknown status.

The Ministerial Decree "260/2010" states that good status is indicated when the concentrations of all priority substances are below the corresponding environmental quality standard, implying that the "one-out, all-out" principle is in place in Italy.

Map 4.1 Chemical status of surface water bodies in Italy 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)

Good
Failing to achieve to good
Unknown
River Basin Districts
Countries outside the EU

The chemical status of surface water bodies in Italy for the first and second RBMPs is given in Table 4.1.

For Italy in general, between the two RBMPs there was a large increase in the proportion of surface water bodies with good chemical status, from 18 % to 72 %, and an increase in the proportion failing to achieve good status, from 4.8 % to 8.5 %. The proportion with unknown status has decreased significantly from 78 % to 20 %. The increase in the proportion of water bodies with good chemical status occurred in all RBDs (such as from 12 % to 82 % for the Eastern Alps RBD and from 4 % to 64 % for Serchio RBD) and this was also the case for the decreases in the proportion with unknown status. The increase in the proportions failing to achieve good status occurred in five RBDs (the North Apennines, Serchio, the South Apennines, Sardinia and Sicily) with the largest increases for Serchio RBD (from 11 % to 25 %) and the North Apennines RBD (from 10 to 18 %). In terms of Natural/Heavily Modified/Artificial water body categorisation, the increases in the proportion of water bodies with good status and decreases with unknown status occurred across all categories.

In the Eastern Alps, Padan, North Apennines and Sicily RBDs, the status of surface water bodies not monitored for chemical status has been derived or extrapolated from monitoring available for comparable water bodies. The remaining four RBDs reported that surface water bodies not monitored for chemical status are reported as unknown status. Territorial waters have not been monitored and have been assigned unknown status.

Table 4.1 Chemical status of surface water bodies in Italy for the second and first RBMPs. 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 2008/105/EC (version in force on 13 January 2009). 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						
Rivers (7493)	5 636	75 %	513	7 %	1 344	18 %
Lakes (347)	167	48 %	35	10 %	145	42 %
Transitional (172)	56	33 %	64	37 %	52	30 %
Coastal (561)	293	52 %	121	22 %	147	26 %
Territorial (8)					8	100 %
Total (8581)	6152	72 %	733	9 %	1696	20 %
first RBMP						
Rivers (7644)	1 397	18 %	397	5 %	5 850	77 %
Lakes (300)	39	13 %	10	3 %	251	84 %
Transitional (181)	34	19 %	4	2 %	143	79 %

Coastal (489)	51	10 %			438	90 %
Total (8614)	1521	18 %	411	5 %	6682	78 %

Source: WISE electronic reporting

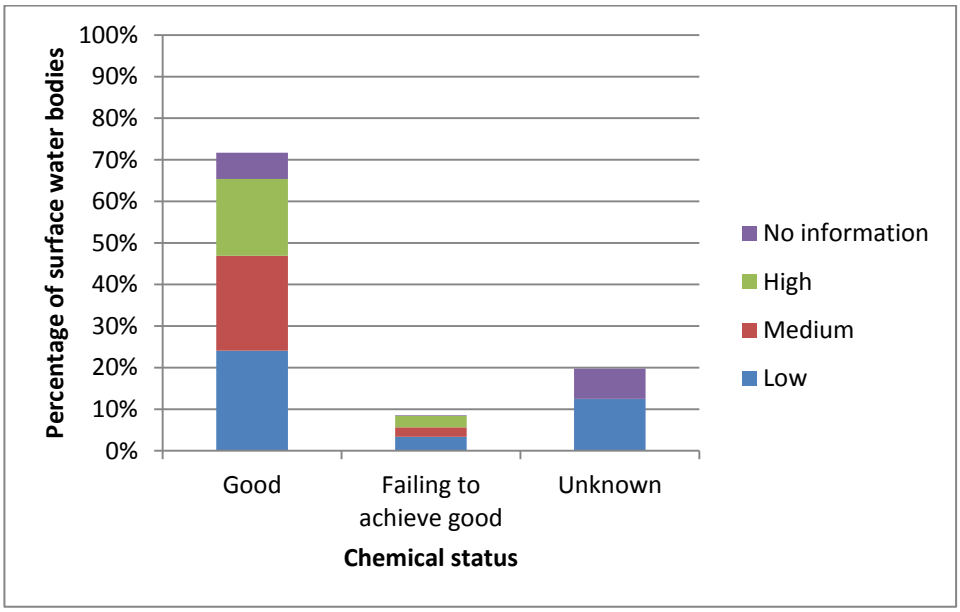
Figure 4.3 shows the confidence in the classification of chemical status for the second RBMP. For Italy in general, 25 % of surface water bodies were classified for chemical status with high confidence, 29 % with medium confidence and 46 % with low confidence. For lakes and rivers between 24 % and 34 % were classified with high confidence, and between 43 % and 45 % with low confidence. For coastal and transitional waters 27 and 20 %, respectively, were classified with high confidence, and 64 and 41 %, respectively, with low confidence. Confidence in the classification of chemical status for the first RBMPs was not reported.

Confidence in the classification is linked to the extent to which it is based on monitoring and use of grouping and expert judgement. In the Sicily RBD all river water bodies were monitored and classified and for the South Apennines RBD this was the case for almost all river water bodies (98 %). However for three RBDs (Padan, Serchio and Central Apennines) between 40 and 66 % of this type of water bodies were monitored and classified and for three RBDs (Eastern Alps, North Apennines and Sardinia) it was between 17 and 33 %. The majority of the remaining river water bodies were not monitored but were still classified.

All transitional water bodies in Italy were monitored and classified. Monitoring was used to classify all coastal water bodies in six out eight RBDs and for 92 and 19 % for the Central Apennines and Sardinia RBDs, respectively. The remainder of coastal water bodies in the Central Apennines RBD were classified by expert judgement and grouping in equal proportions. The remainder of coastal water bodies in the Sardinia RBD were classified by grouping. All lake water bodies in five out of eight RBDs were classified by monitoring, whereas 50, 81 and 89 % of lake water bodies were classified by monitoring in the Eastern Alps, Padan and Central Apennines RBDs, respectively. The remaining lake water bodies were classified by both expert judgement and grouping. All river water bodies in the Sicily RBD were classified by monitoring and this was for 99 % of water bodies in the South Apennines RBD. The proportion of river water bodies classified by monitoring across the remaining six RBDs ranged between 17 and 66 %. The remaining river water bodies were classified by both expert judgement and grouping.

Further specific information has been reviewed in the RBMP for the North Apennines RBD, which stated that the regions in the RBD have grouped water bodies and monitored representative water bodies for each group. The RBMP stated that this has been carried out according to the requirements of “Decree 260/2010”.

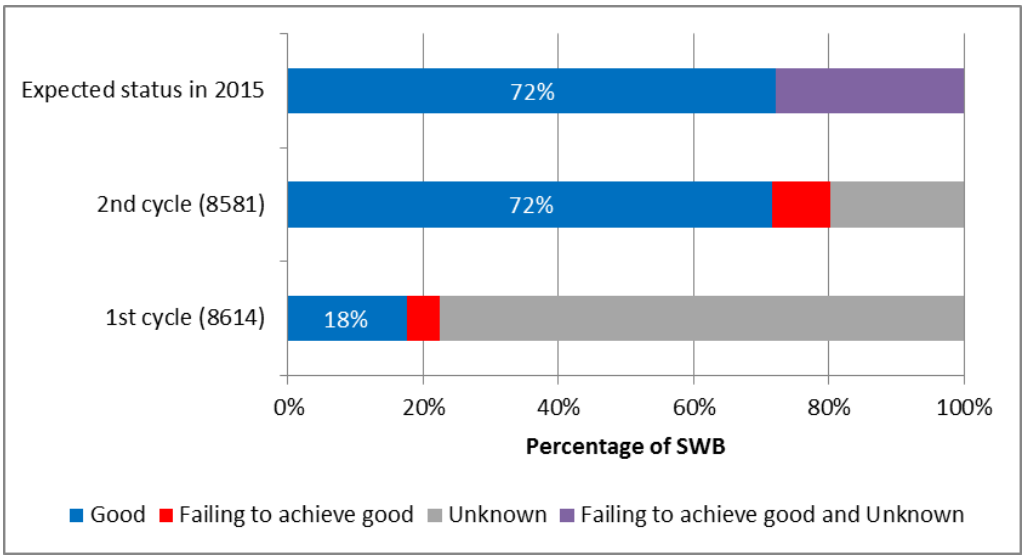
Figure 4.3 Confidence in the classification of chemical status of surface water bodies in Italy based on the most recently assessed status/potential



Source: WISE electronic reporting

Figure 4.4 compares the chemical status of surface water bodies in Italy for the first RBMP with that for the second RBMP (based on the most recent assessment of status) and that expected by 2015. The percentage of water bodies at good status reported in the second RBMP was as expected in 2015.

Figure 4.4 ***Chemical status of surface water bodies in Italy for the second RBMP, for the first RBMP 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 2009 to 2015. The year of the assessment of status for first RBMP is not known***



Source: WISE electronic reporting

The assessment of chemical status for the second RBMP was expected to be based on the standards laid down in EQS Directive 2008/105/EC (version in force on 13 January 2009[58]). 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.

More information on the chemical status in each RBD and water category can be found on the website of the European Environment Agency[59].

Directive 2013/39/EU amended the EQS Directive. In particular, it sets more stringent environmental quality standards for seven substances[60]. Member States were required to indicate if the new standard caused the status of the surface water body to appear to deteriorate. This was the case for several substances in two of the RBDs (Eastern Alps and Sardinia) with

[58] Please note that 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.

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

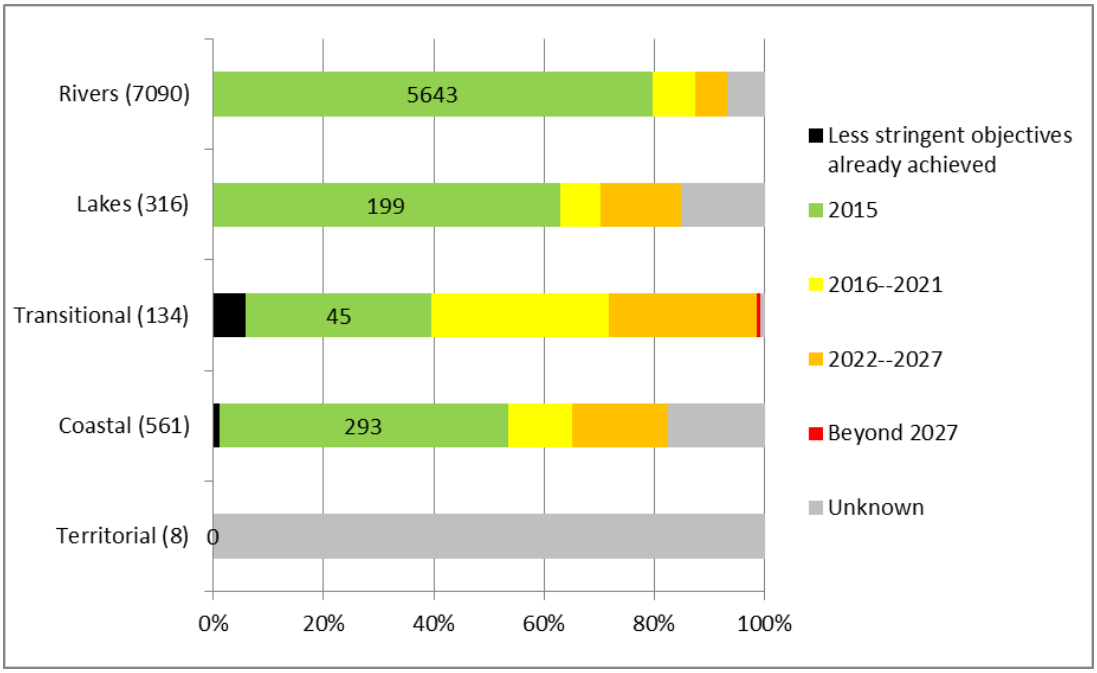
[60] Anthracene, Brominated diphenylether, Fluoranthene, Lead and its compounds, Naphthalene, Nickel and its compounds, Polyaromatic hydrocarbons (PAH)

benzo(a)pyrene having the most influence in coastal and transitional waters in the Eastern Alps RBD and lead having the most influence in Sardinia RBD.

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 Italy is shown in Figure 4.5. In Italy, good chemical status of surface water bodies is, in general, expected to be achieved by the end of the third planning cycle (2027). However there were several exceptions, for example 9 % of transitional waters in the North Apennines RBD were not expected to achieve good status and also 4 % of coastal waters in the Central Apennines RBD. The Eastern Alps RBD appears to have applied less stringent objectives which have already been achieved for 29 % of coastal water bodies and 16 % of transitional waters. There appears to be a number of unknown dates for expected achievement of good chemical status, particularly for the South Apennines RBD for of all surface water body categories. The date for achieving good chemical status for all territorial water bodies was also unknown.

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



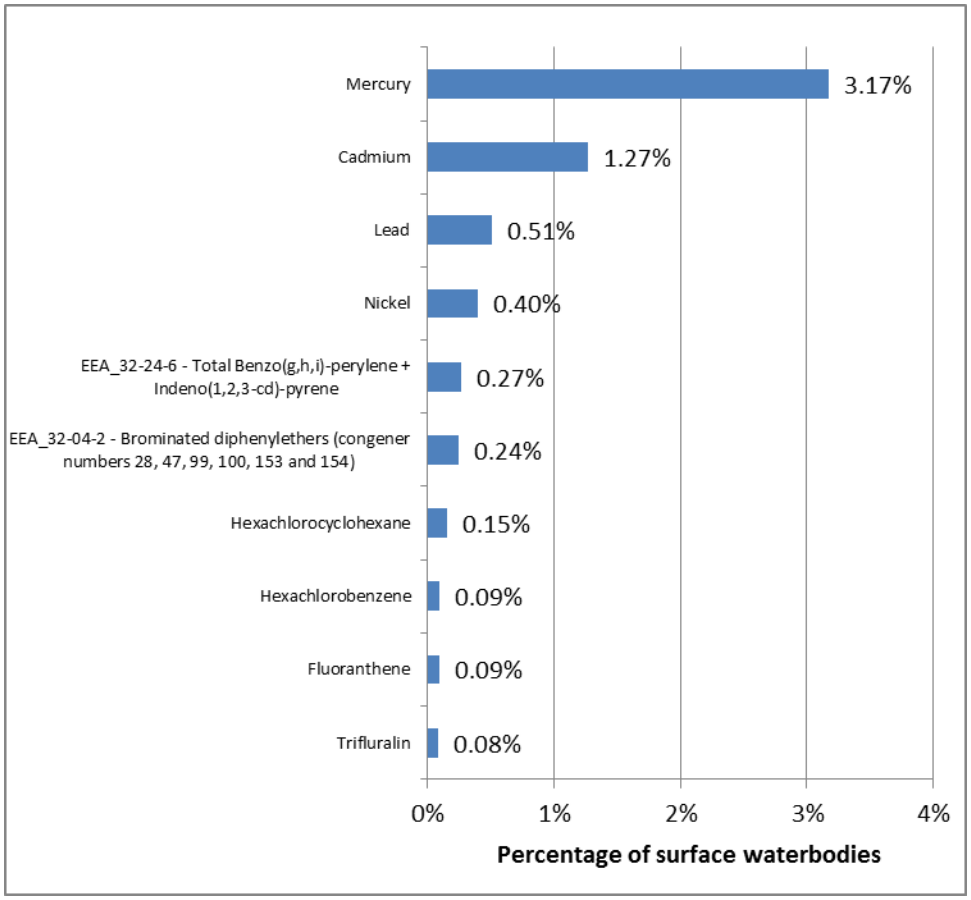
Source: WISE electronic reporting

Priority substances causing the failure of good chemical status

Member States were expected to report exceedances for individual substances on the basis of the most relevant Environmental Quality Standard for each substance. For the seven Priority Substances with more stringent 2013 Environmental Quality Standards, exceedance of either or both of the 2008 and 2013 standards (as appropriate) should have been reported (see above).

The "top-10" Priority Substances causing water bodies to fail chemical status 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 Italy***



Source: WISE electronic reporting

For surface water bodies in Italy, the largest proportion of exceedances was for the annual average environmental quality standard for mercury (18 %) and cadmium (12 %). Exceedances of maximum allowable concentration environmental quality standards were largest for mercury (16 %). In terms of exceedance of both types of standards, the largest proportion was for mercury (7 %).

Ubiquitous persistent, bioaccumulative and toxic priority substances

According to article 8(a) of the EQS Directive[61], eight priority substances and groups of priority substances are behaving like ubiquitous, persistent, bioaccumulative and toxic substances[62]. These substances are generally expected to cause widespread exceedances, and

[61] Amended by Directive 2013/39/EU

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

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

Overall in Italy 9 % of surface water bodies are failing to achieve good chemical status. If the exceedances of environmental quality standards from these substances are disregarded, the proportion of surface water bodies failing to achieve good status reduces to 3 %. The influence of these substances on the assessment of chemical status in the second RBMP is therefore moderate. However, 20 % of surface water bodies have unknown status and are not monitored. Consequently, the true extent of the effect of ubiquitous, persistent, bioaccumulative and toxic substances is not known. This is illustrated in the 2018 State of Water report of the European Environment Agency[63].

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

In seven out of the eight RBDs, all of the Priority Substances monitored were used in the assessment of chemical status. The substances not monitored and not used in the assessment were: chloroalkanes (Eastern Alps, Serchio, Southern Apennines and Sicily RBDs), octylphenol (4-(1,1',3,3'-tetramethylbutyl)-phenol) (Serchio and Sicily RBDs), tributyltin-cation (Southern Apennines RBD) and brominated diphenylethers (congener numbers 28, 47, 99, 100, 153 and 154) (South Apennines and Sicily RBDs).

Further information is provided in the RBMP for the North Apennines RBD (as an Annex) which states that individual regions chose which substances to monitor, based on knowledge about pressures and about the typology of waters (no further explanation was provided). This annex provides lists of substances monitored by region.

The Central Apennines RBD has partially reported data to WISE due to a lack of data, so a full assessment of priority substances used in the assessment of chemical status cannot be made for this RBD. The situation also differs amongst its regions.

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

[63] 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

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.

The Sardinia RBD reported that all of the environmental quality standards had been applied and used in the assessment of chemical status. The Eastern Alps, Padan, the North Apennines, Serchio, the Central Apennines, the South Apennines RBDs reported that 38 of the 41 environmental quality standards were used for assessment of the chemical status of bodies of surface water had been applied and used in the assessment of chemical status. These RBDs reported the use of the biota standards for hexachlorobenzene, mercury and hexachlorobutadiene in Article 3(2) of the 2008 Environmental Standards Directive in biota as alternative standards[64]. The Central Apennines RBD have partially reported to WISE due to a lack of data, so it is unknown which environmental quality standards were used in the assessment of chemical status.

The Eastern Alps, North Apennines, Serchio, Central Apennines, South Apennines and Sicily RBDs reported that alternative and/or additional standards for particular Priority Substances had been applied for 10 substances predominantly in sediment (plus biota and water[65] for hexachlorobenzene, mercury and hexachlorobutadiene) primarily across coastal and transitional surface water categories and applied at the National scale.

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 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 Italy.

[64] In case of the Padan RBD it is highlighted that biota standards for transitional waters are used for trend assessment and not for classification (for which water and sediment standards are used).

[65] Italy subsequently clarified that alternative standards for hexachlorobenzene, mercury and hexachlorobutadiene in water achieving the same level of protection as the environmental quality standard for biota have been derived and implemented through national legislation.

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 where such concentrations prevent compliance with the relevant environmental quality standards in four of the RBDs in Italy but not in two RBDs. Information has not been provided for the Padan RBD and the Sicily RBD. Italy subsequently clarified that individual measures have been reported in the Programme of Measures (associated with KTM14) to address the knowledge gaps in the Padan RBMP including consideration of natural background concentrations.

Water quality parameters that affect the bioavailability of metals have been taken into account in three RBDs in Italy but not in three other RBDs. Information has not been provided for the Serchio RBD and the Sicily RBD.

4.2 Main changes in implementation and compliance since the first cycle

In comparing the number of sites and water bodies monitored (though not specific to chemical status) between the first and second RBMPs, there appears to be a net increase in monitoring sites and surface water bodies monitored for operational purposes (an increase of 819 sites and 832 water bodies) both due to a relatively large increase in river and coastal monitoring. For surveillance monitoring the number of sites has increased by 892 and the number of water bodies has increased by 836 since the first RBMP. The RBMP for the North Apennines RBD notes that for the first RBMP, in the face of major gaps, attempts at status assessment were made (for both ecological and chemical status) using existing data and expert judgement.

It should be noted that there has been a re-delineation of water bodies between the first and the second RBMPs and that therefore a strict comparison of status between the two cycles should be treated with some caution. Between the two RBMPs there was a large increase in the proportion of surface water bodies with good chemical status from 18 % to 72 % and an increase in the proportion failing to achieve good status from 4.8 % to 8.5 %. Importantly, the

proportion with unknown status has reduced significantly from 78 % to 20 %; this reflects the greater spatial extent of monitoring reported in the second RBMP.

There were eight Priority Substances that were reported to have resulted in the improvement of surface water bodies from failing to achieve good to good status since the first RBMPs. Water bodies showed improvements as a result of reductions of tributyltin-cation (0.9 %) and mercury (0.8 %). All the improvements were in water bodies located in the Eastern Alps RBD and the North Apennines RBD, for all surface water categories apart from territorial waters.

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: *Where there are currently high uncertainties in the characterisation of the RBDs, identification of pressures, and assessment of status, these need to be addressed in the current cycle, to ensure that adequate measures can be put in place before the next cycle.*

  Assessment: With respect to chemical status, for Italy in general, 25 % of surface water bodies were classified for chemical status with high confidence, 29 % with medium confidence and 46 % with low confidence. For lakes and rivers, between 24 % and 34 % were classified with high confidence and between 43 % and 45 % with low confidence. For coastal and transitional waters, 27 and 20 %, respectively, were classified with high confidence, and 64 and 41 %, respectively, with low confidence. Confidence in the classification of chemical status for the first RBMPs was not reported. Moreover, an effort has been made to increase the proportion of water bodies with good chemical status (from 18 % to 72 %) and to reduce the proportion of water bodies with unknown status (from 78 % to 20 %). This recommendation is partially fulfilled.

- *Recommendation: The high percentage of water bodies that have an unknown status prevents effective planning and comparability with other Member States. Assessment methods should be used taking into account the work on intercalibration. Complete the development of methods for the status assessment of water bodies and apply them through the implementation of robust monitoring programmes.*

- Assessment: With respect to chemical status, the proportion of surface water bodies with unknown status has reduced significantly from 78 % to 20 % since the first RBMPs. In

both RBMPs, unknown status was assigned to surface water bodies where monitoring was not undertaken (and where grouping and expert judgement could not be applied). This reflects the greater spatial extent of monitoring reported in the second RBMP. There has been a net increase in monitoring sites and surface water bodies monitored for operational purposes (an increase of 819 sites and 832 water bodies) both due to a relatively large increase in river and coastal monitoring reported in the second RBMPs. For surveillance monitoring, the number of sites has increased by 892 and the number of water bodies has increased by 836 since the first RBMPs. Monitoring was reported for 40 priority substances in water at the site level in the Eastern Alps RBD, 41 substances for the Padan, North Apennines and the Central Apennines RBDs, 35 substances for the Serchio RBD, 39 substances for the South Apennines RBD, 38 substances for the Sardinia RBD and 32 substances for the Sicily RBD. A high proportion of water bodies in these RBDs were monitored for more than 10 Priority Substances. Mercury, hexachlorobenzene and hexachlorobutadiene were monitored in biota for status assessment in four RBDs in coastal and transitional waters but not in surface freshwaters. Monitoring was undertaken at a low proportion of monitoring sites. Monitoring frequencies in water met the minimum requirements of the Directive at some sites. Conversely, there are some substances and some sites that are monitored less frequently in each RBD. Monitoring frequencies in biota meet the once every year requirements of the Directive in each site monitored. Italy clarified that reduced monitoring frequencies are specified in national legislation. With respect to the development of methods for status assessment with regards to chemical status, seven of the eight RBDs used the majority of the environmental quality standards laid down in Part A of Annex I of the Directive 2008/105/EC.[66] This recommendation is partially fulfilled.

- Recommendation: *Monitoring is an important part of river basin planning and affects the quality and effectiveness of subsequent steps. The current monitoring gaps for BQEs, supporting quality elements and priority substances should be addressed.*

  Assessment: In five of the eight RBDs almost all of the priority substances discharged into the RBDs are monitored. For the remainder, while inventories have been produced and submitted to the Commission through Reportnet, they have not all been reported in the RBMPs and therefore in performing the current assessment it was not always possible to

[66] 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

identify which substances are discharged into the RBs and compare with the list of monitored priority substances. Developments in the monitoring programmes to support status assessment have been described in response to the previous recommendation. With respect to monitoring for long-term trend assessment, Italy monitors up to 10 of the 14 Priority Substances in sediment and/or biota in four of the eight RBDs (Eastern Alps, Padan, North Apennines and Serchio); tributyltin is not monitored in the Serchio RBD. Each of the 10 substances is monitored at between 48 and 223 monitoring sites in coastal and transitional waters across all RBDs monitored. No monitoring for trend assessment is carried out in surface freshwaters. Almost all sites for trend assessment were monitored at a frequency of at least once every three years which meets the minimum requirements of the Directive. This recommendation is partially fulfilled.

- Recommendation: *The plans should state clearly which priority substances have been measured where, and in which matrix, and monitoring should be extended where necessary to ensure that the chemical status of all water bodies can be assessed. The assessment should be based on the environmental quality standard in the EQS Directive, including the biota environmental quality standards for mercury, hexachlorobenzene and hexachlorobutadiene unless environmental quality standard for water that provide an equivalent level of protection have been derived. Trend monitoring in sediment or biota for at least the substances specified in EQS Directive Article 3(3) will also need to be reflected in the next RBMP.*

  Assessment: Italy has reported the Priority Substances monitored in water, sediment and biota to underpin both status assessment and long-term trend monitoring. These have been described in the assessment of the recommendations above. The spatial extents of the monitoring programmes in surface waters have been extended since those reported in the first RBMPs and have resulted in the classification of 80 % of water bodies; the proportion of water bodies in unknown status has reduced from 78 to 20 %.

  Seven of the eight RBDs used the majority of the environmental quality standards laid down in Part A of Annex I of the Directive 2008/105/EC. Reporting to WISE was incomplete for the remaining RBD (Central Apennines). Where alternative standards have been used, these have been included in national legislation and communicated to the Commission.

  Arrangements are reported to be in place for the long-term trend analysis in two RBDs (Eastern Alps and North Apennines) but not in three other RBDs (Central Apennines, South Apennines and Sardinia). No information is reported for the Serchio and Sicily

RBDs. The Padan and Serchio RBD reported to WISE that arrangements were not in place, but this was probably a reporting mistake as some monitoring for trends is reported in sediment. Trend monitoring in sediment and/or biota has been implemented in coastal waters in four of the eight RBDs, but has not been implemented in surface freshwaters.

This recommendation is 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

The total number of groundwater bodies in Italy is 1052 (Table 2.2). 512 groundwater bodies are not subject to monitoring for quantitative status (Table 5.1). This means that 49 % of groundwater bodies are not monitored for quantitative status. The percentage of groundwater bodies per RBD without monitoring for quantitative status ranges between 4 % and 82 % with variations among Districts (Table 5.3). A review of selected RBMPs and supporting background documents did not find any indication that grouping was applied for the assessment of quantitative status.

The number of groundwater bodies increased from 847 (in seven reported RBDs) in the first RBMPs to 1052 (in eight reported RBDs) in the second cycle. Since the first RBMPs information for the Sicily RBD was now also reported (82 groundwater bodies). 691 groundwater bodies remained unchanged since the first RBMPs. The total reported groundwater body area increased by about 24 %. The groundwater body area increased considerably in the Eastern Alps, Padan, North Apennines and Sicily RBDs compared to the first RBMPs.

The number of monitoring sites is listed in Table 5.2 and shows that the number of monitoring sites for quantitative status in the second RBMP is 3538. A comparison with the first RBMPs cannot be drawn since this information is not available.

591 of 1052 groundwater bodies, located in all RBDs, are identified as drinking water protected areas.

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

RBD	Total groundwater bodies directly monitored	Monitoring Purpose											
		AGR – Ground-water abstrac-tion site for irrigatio n	CHE – Chemical status	DRI – Ground-water abstrac-tion site for human consump -tion	DWD - Drinking water - WFD Annex IV.1.i	HAB - Protectio n of habitats or species dependin g on water - WFD Annex IV.1.v	IND – Ground-water abstrac-tion site for industria l supply	NID - Nutrient sensitive area under the Nitrates Directive - WFD Annex IV.1.iv	OPE – Operatio -nal monitor-ing	QUA – Quantita -tive status	SOE - EIONET State of Environ-ment monitor-ing	SUR – Surveil-lance monitor-ing	TRE - Chemical trend assess-ment
ITA	105		70		26		1	33	23	43	33	105	70
ITB	140	15	140	26			16	43	55	127	140	136	
ITC	179		146 (178)		55	17		39	85	151	90	80	
ITD	8								5	2		4	
ITE	77 (93)		71					15	19	45	37	26	23
ITF	164 (184)	10	29 (49)	12				19	81	46		111	29
ITG	109		109						47	109		62	47
ITH	55		52							17			

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

Table 5.2 Number of groundwater monitoring sites in Italy and their purpose

RBD	Total groundwater monitoring sites	Monitoring Purpose											
		AGR – Groundwater abstraction site for irrigation	CHE – Chemical status	DRI – Groundwater 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 – Groundwater abstraction site for industrial supply	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
ITA	823		490		60		2	305	225	446 (460)	305	650	490
ITB	1 578	43	1 405 (1413)	261			56	203	688	865 (878)	1 468	1 389	
ITC	1 084		750 (896)		283	51		153	433	646	452	288	
ITD	43								26	6 (7)		10	
ITE	897		670					213	250	526	222	173	403
ITF	1 148	52	267 (307)	52				118	596	385		654	267
ITG	630		620						431	616 (630)		189	431
ITH	441		393							48			

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

Table 5.3 Proportion of groundwater bodies in Italy monitored for quantitative status

RBD	No of groundwater bodies with quantitative monitoring	Total No. groundwater bodies	% of total groundwater bodies monitored for quantitative status
ITA	43	118	36.44 %
ITB	127	167	76.05 %
ITC	151	222	68.02 %
ITD	2	11	18.18 %
ITE	45	128	35.16 %
ITF	46	210	21.90 %
ITG	109	114	95.61 %
ITH	17	82	20.73 %

Source: WISE electronic reporting

5.1.2 Assessment and classification of quantitative status for groundwater

Map 5.1 displays the most recently assessed quantitative status of groundwater bodies. It shows that 642 in 1052 groundwater bodies (61 %) were in good quantitative status, 151 groundwater bodies (14 %) were failing good status and 259 (25 %) had unknown status (Figure 5.1). In terms of area this means that about 9 % were failing good quantitative status. Figure 5.2 shows the confidence in status classifications.

The total number of groundwater bodies failing good quantitative status increased significantly by 15 % from 115 in the first RBMP to 151 in the second RBMP. This increase is also reflected in terms of groundwater body area failing good status. One main reason for this increase is the fact that information from the Sicily RBD was not available for the first cycle. The total number of groundwater bodies with unknown status increased slightly from 252 in the first cycle to 259 in the second cycle. The number of groundwater bodies with unknown status decreased in the Eastern Alps, Padan and Sardinia RBDs, but increased in the North Apennines[67], Central Apennines[68] and South Apennines RBDs[69].

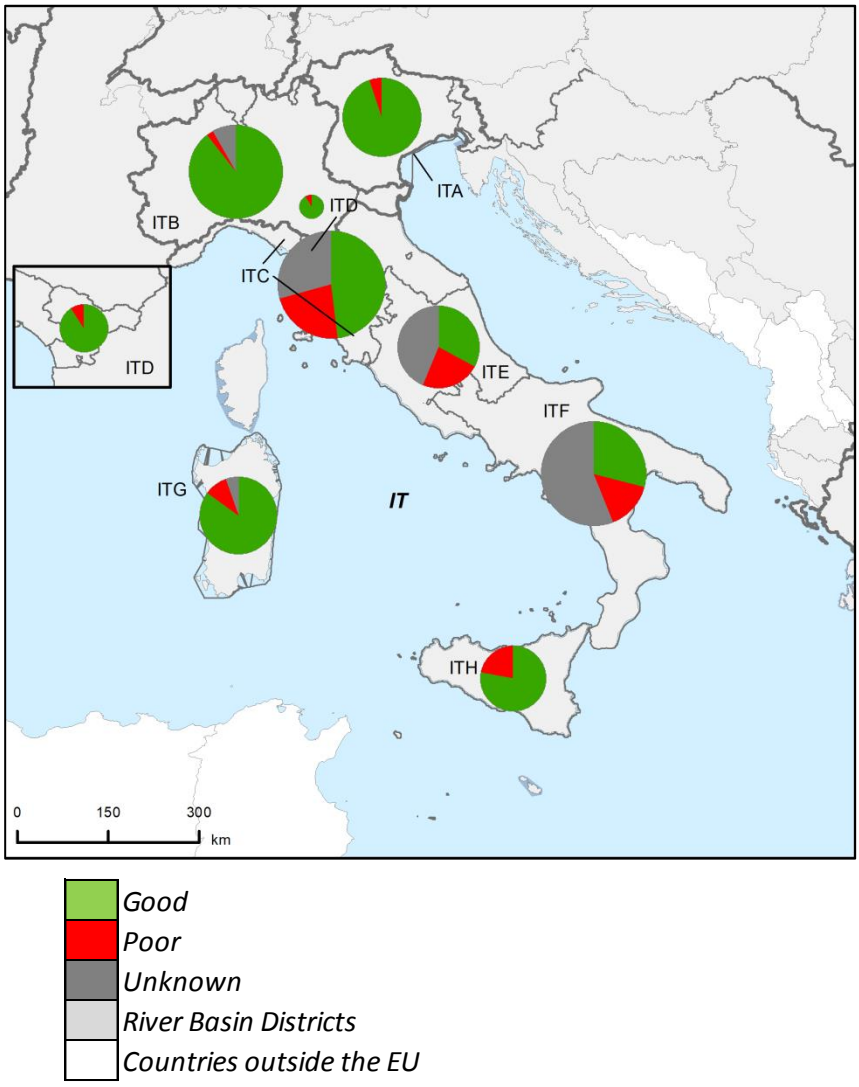
[67] Italy subsequently clarified that in the Northern Apennines RBD the new groundwater bodies are mainly non alluvial, and are located in the Liguria Region. The concerned groundwater bodies are being monitored and will be classified in the third RBMP.

[68] Italy subsequently clarified that this increase in the Central Apennines RBD is due to the fact that, in the first cycle, some Regions (e.g. Marche, Lazio) assessed groundwater bodies' status through expert judgment due to the limited availability of data.

[69] Italy subsequently clarified that for the South Apennines RBD this slight increase is linked to the identification of new groundwater bodies, and, in particular for Basilicata and Calabria, improved monitoring programmes. In some cases the groundwater body was monitored but the quantitative data were not available. Nonetheless, the South Apennines RBMP provides quantitative status for each groundwater body, based on available monitoring data and on expert judgement using pressures analysis.

For all eight RBDs a water balance method was reported to have been applied to assess status. In three RBDs the water balance was assessed by a comparison of annual average groundwater abstraction against the 'available groundwater resource' for every groundwater body, in three RBDs this assessment was done for a subset of all groundwater bodies. In two RBDs water balance was assessed by using reliable information on groundwater levels across the groundwater body.

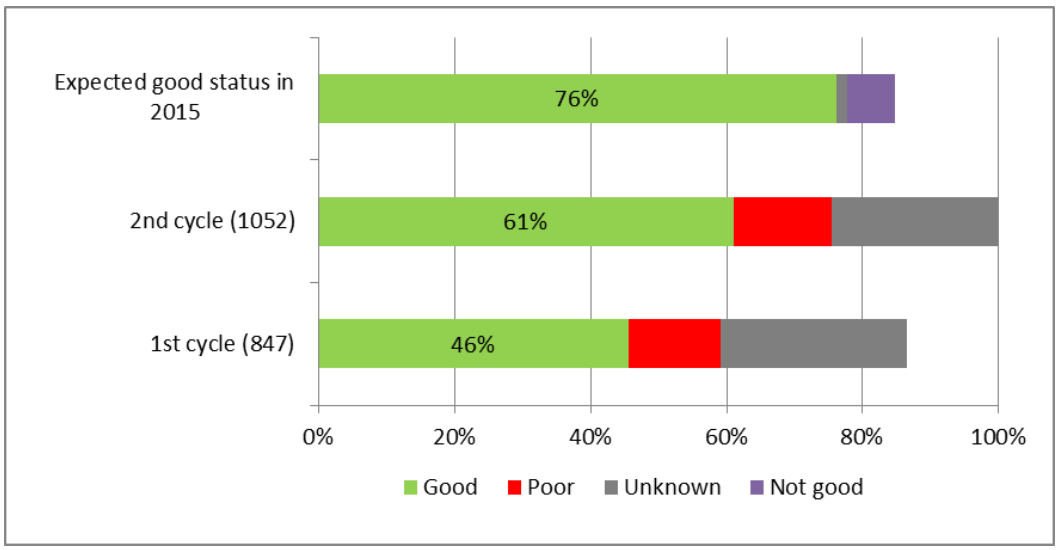
Map 5.1 ***Map of quantitative status of groundwater bodies based on the most recently assessed status of the groundwater bodies***



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

Source: WISE, Eurostat (country borders)

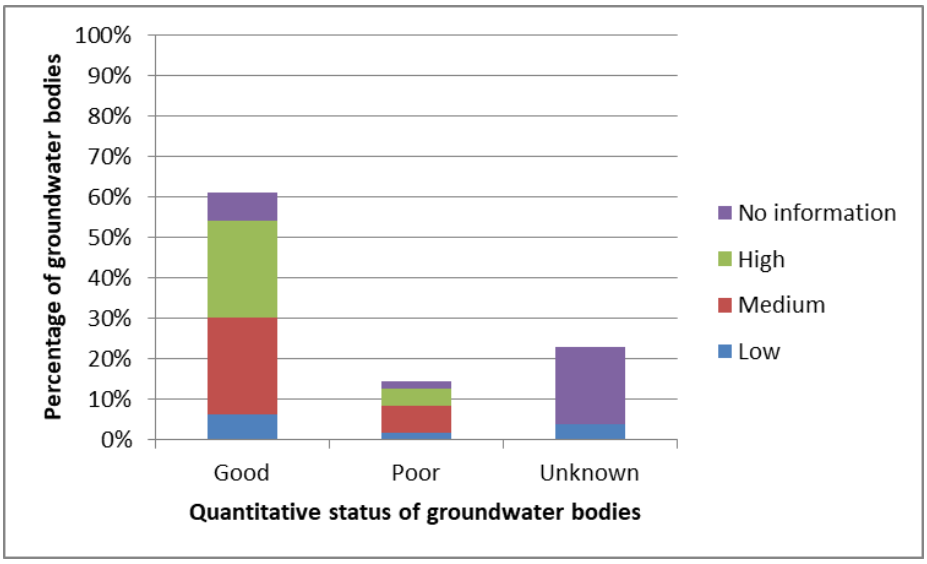
Figure 5.1 ***Quantitative status of groundwater bodies in Italy for the second RBMP, for the first RBMP and expected in 2015. The number in the parenthesis is the number of groundwater bodies for both cycles. Note the period of the assessment of status for the second RBMP was 2007 to 2012. The year of the assessment of status for first RBMP is not known***



Source: WISE electronic reporting

Note: values in figure for the first RBMP are those originally reported to WISE and do not reflect changes after the 2012 report, with the exception of the total number of waterbodies, which includes Sardinian groundwater bodies.

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



Source: WISE electronic reporting

There are several reasons for failing good quantitative status of groundwater bodies as shown in Figure 5.3[70]: 195 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. 27 groundwater bodies are failing due to saline intrusions and 12 groundwater bodies are failing due to diminution of the status of associated surface waters. The expected date of achievement of good quantitative in Italy is shown in Figure 5.4. One groundwater body is expected to achieve good status beyond 2027. For nine groundwater bodies in the Central Apennines RBD and six groundwater bodies in Sardinia RBD the date of achievement of good quantitative is unknown.

In two RBDs (the North Apennines and the Central Apennines) the criterion of 'available groundwater resource' has been fully applied in accordance with WFD Article 2(27), in two RBDs (the Eastern Alps and Sardinia) the criterion has been partly applied. In three RBDs (Padan, Serchio and Sicily) the criterion of 'available groundwater resource' has not been applied in accordance with WFD Article 2(27).[71] The RBMP of the South Apennines RBD indicates that data needed for the application of the method were not available.

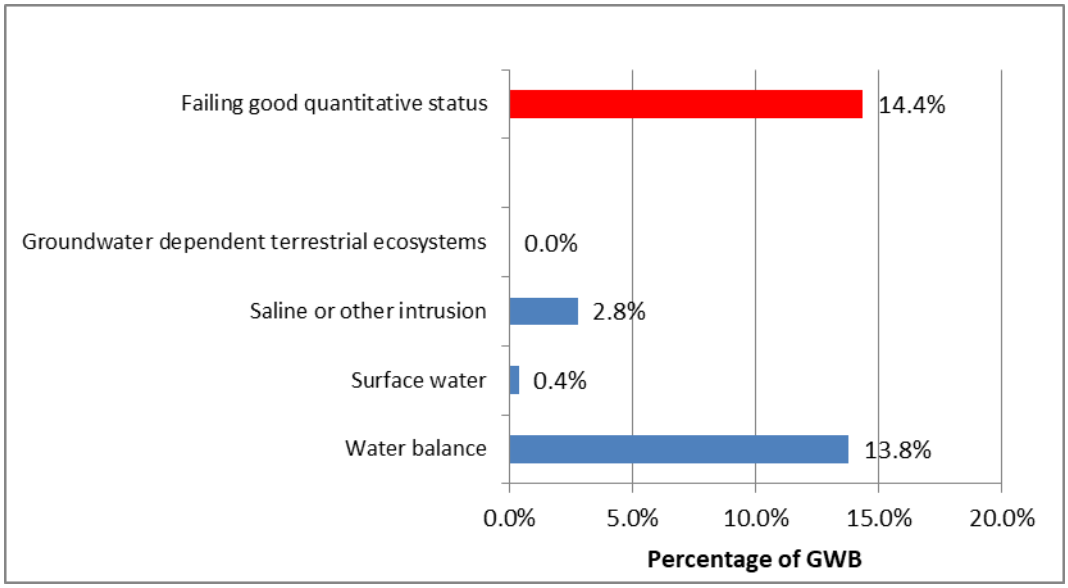
Not all relevant environmental objectives have been considered in all RBDs in status assessment. The Eastern Alps RBD has groundwater bodies at risk of failing good quantitative status due to deterioration or damage to linked ecosystems (associated surface water bodies and groundwater dependent terrestrial ecosystems) but these ecosystems were not considered in status assessment. In six of eight RBDs saline intrusions have been considered for status assessment but not in the Sicily RBD, even if it is an island.

In total 227 (22 %) groundwater bodies are at risk of failing good quantitative status. Risk is mainly related to harm caused by actual or potential legitimate uses or functions of groundwater (208 groundwater bodies).

[70] Italy subsequently corrected these figures: 145 groundwater bodies are failing good status due to failing the water balance, 29 groundwater bodies are failing due to saline intrusions and 4 groundwater bodies are failing due to diminution of the status of associated surface waters.

[71] Italy subsequently clarified that a national guideline (guideline ISPRA n. 157/2017) was published in 2017 to follow the recommendations of the European Commission.

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



Source: WISE electronic reporting

Notes:

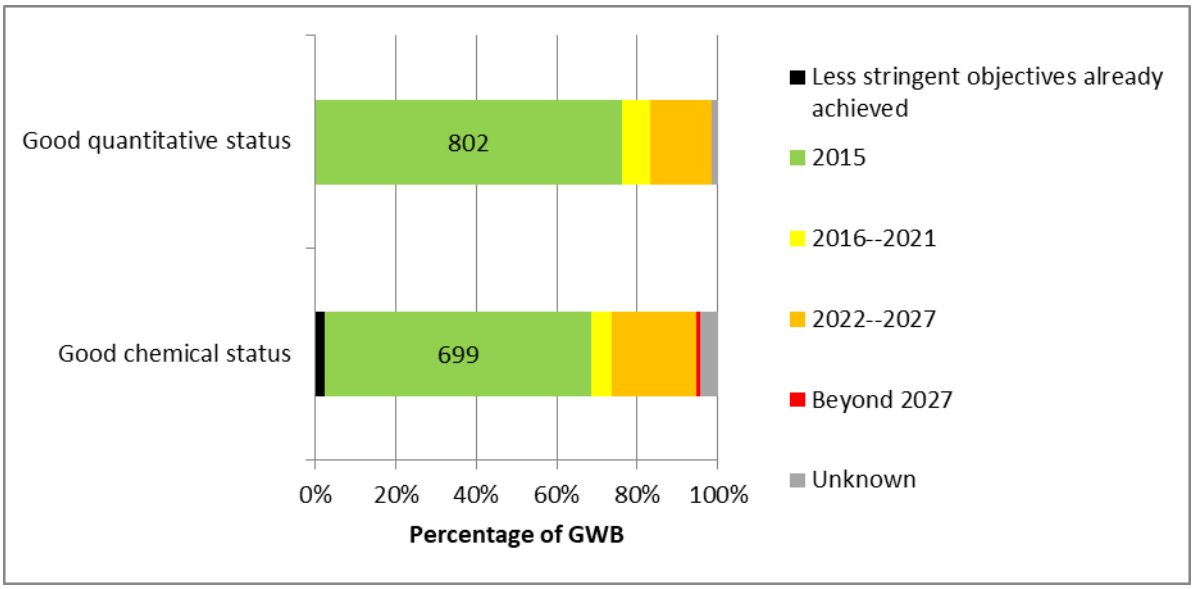
'Water balance' = long-term annual average rate of abstraction exceeds the available groundwater resource which may result in a decrease of groundwater levels.

'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 Italy. 1052 groundwater bodies delineated for second RBMP***



Source: WISE electronic reporting

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

Groundwater associated surface waters were considered in status assessment except for the Eastern Alps RBD. In total 241 groundwater bodies were associated with surface water bodies. They were partly related to a risk.

In the Eastern Alps and Padan RBDs for a total of 30 groundwater bodies, groundwater dependent terrestrial ecosystems were identified. They are partly related to a risk. In the Eastern Alps RBD, groundwater dependent terrestrial ecosystems were not considered in the status assessment, in the Padan RBD they were considered. In both RBDs the needs of terrestrial ecosystems were assessed.

5.2 Main changes in implementation and compliance since the first cycle

The number of groundwater bodies increased from 887 (in seven reported RBDs) in the first RBMP to 1052 (in eight reported RBDs) in the second cycle. Since the first RBMPs information for the Sicily RBD was now also reported (82 groundwater bodies). 691 groundwater bodies remained unchanged since the first RBMP. The total reported groundwater

body area increased by about 24 %. The total number of groundwater bodies with unknown status increased slightly from 252 in the first RBMP to 259 in the second cycle.[72]

The groundwater body area increased considerably in the Eastern Alps, Padan, North Apennines and Sicily RBDs compared to what was reported for the first RBMPs. The assessment of selected RBMPs (Padan and South Apennines) found a summary of changes since the first RBMPs. It reported that the identification of groundwater bodies was updated for the second RBMPs – for the Padan RBD it refers in particular to the Lombardy Region, which reviewed the structure of its aquifers and redefined its groundwater bodies in its regional Water Protection Plan (Piano di Tutela delle Acque). In total, 167 groundwater bodies were identified in the Padan RBD. In the South Apennines RBD[73] some groundwater bodies were divided and others merged (while other regions - Basilicata, Calabria and Lazio - did not change the number of groundwater bodies). The RBMP lists the changes in the number of groundwater bodies by region. The RBMP of the South Apennines RBD nonetheless states that the delineation of groundwater bodies needs further refinement, including in terms of the assignment of groundwater bodies lying between neighbouring RBDs (i.e. the Central Apennines RBD).

The monitoring situation is not fully representative, with only about half of the groundwater bodies in Italy being monitored for quantitative status. The percentage of groundwater bodies per RBD without monitoring ranges between 18 % and 96 % and varies amongst different districts.[74]

The RBMP for the South Apennines RBD describes for example the strengthened monitoring of nitrates and pesticides in several regions. Also monitoring and research on groundwater-dependent terrestrial ecosystems was carried out via a LIFE project in Abruzzo Region. In general, the regions have worked to bring their groundwater monitoring programmes in line

[72] Italy subsequently provided additional information on the changes between both cycles. For the Northern Apennines RBD, additional groundwater bodies (particularly non alluvial) have been added. For Sardinia the total number of groundwater bodies with unknown quantitative status changed from 20 (18 % of the total) in 2010 to 11 (10 % of the total, representing 1 % of the total area of groundwater bodies) in 2015. For South Apennines an update on groundwater bodies was made by a deeper analysis carried out based on new and more detailed hydrogeological data and monitored data, improving the information acquired for the 1st RBMP.

[73] Italy subsequently clarified that a deeper analysis has resulted in merging or dividing previous groundwater bodies. In particular, those located across different Regions have been divided in order to assign the corresponding portion of the groundwater body to the competent Region. Technical working groups have been established at District level and regional level to investigate the hydrogeological aspects of shared aquifers and if necessary coordinate monitoring activities.

[74] Italy subsequently clarified that a national methodology has been developed and a national guideline published (ISPRA GUIDELINE. 157/2017 "Technical Criteria for the analysis of quantitative status and monitoring in Groundwater bodies"). For Sardinia 95 % of the groundwater bodies are monitored for quantitative status.

with the WFD's requirements: for example, the Abruzzo Region "defined and activated" a monitoring programme as per these requirements in the first RBMP, implying that it was not in place previously; other regions brought their monitoring programmes in line with the requirements; The Basilicata Region developed its monitoring system (it is not clear if monitoring was carried out); and Calabria Region "completed the definition" of a project for monitoring, which started in 2015, implying that full results were not in place for the second RBMP, though 211 monitoring sites are indicated. The RBMP briefly describes the monitoring programmes of the regions - it does not compare these to monitoring in place for the first RBMP, except where the number of sites has not changed (for example, for Lazio Region).

The RBMP for the South Apennines RBD also notes that several actions are needed to strengthen groundwater monitoring, extending the monitoring network in some regions and strengthening coordination for groundwater bodies crossing RBD and regional boundaries.

Based on the reported information, the status situation has deteriorated. The number of groundwater bodies failing good quantitative status has changed from 115 in the first RBMP to 83 in the second RBMP[75].

The RBMP for the South Apennines RBD, provides data for the quantitative status of groundwater bodies across nearly all regions - however, these refer to 92 out of 201 groundwater bodies identified, and the period refers to 2005 to 2014, so it does not show relevant changes between cycles.

The RBMP and supporting background documents concluded that the changes in the status were mainly resulting from the re-delineations of groundwater bodies and probably due to further development of the assessment methodology.

5.3 Progress with Commission recommendations

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

- Recommendation: *The high percentage of water bodies that have an unknown status prevents effective planning and comparability with other Member States. Complete the development of methods for the status assessment of water bodies.*

[75] Italy subsequently indicated that a comparison between cycles might not be meaningful due to the difference in the number of groundwater bodies.

Assessment: The total number of groundwater bodies with unknown status has increased and therefore in terms of quantitative status for groundwaters, this recommendation has not been fulfilled.

- Recommendation: *Monitoring is an important part of river basin planning and affects the quality and effectiveness of subsequent steps.*

  Assessment: Overall, only 540 of 1 052 groundwater bodies (49 %) are subject to quantitative monitoring. The coverage of monitoring varies at RBD level between 18 and 96 %. The recommendation has therefore been partially fulfilled.

- Recommendation: *Quantitative aspects for surface and groundwater should be properly taken into account during the monitoring and assessment phases.*

  Assessment: On the basis of the information that was found in the RBMPs and supporting background documents, there has been progress, in particular for groundwater monitoring in Padan RBD. However, further work is needed in both RBDs and especially in the South Apennines RBD. Moreover, based on information provided, further work is needed at national level for applying methodologies for quantitative monitoring of groundwater. As stated for the recommendation above, overall in Italy, only 540 of 1052 groundwater bodies (49 %) were reported in the second RBMPs to be subject to quantitative monitoring and the total number of groundwater bodies with unknown quantitative status remained approximately unchanged at a level of 25 % of all groundwater bodies, although the number of water bodies increased in the second cycle.

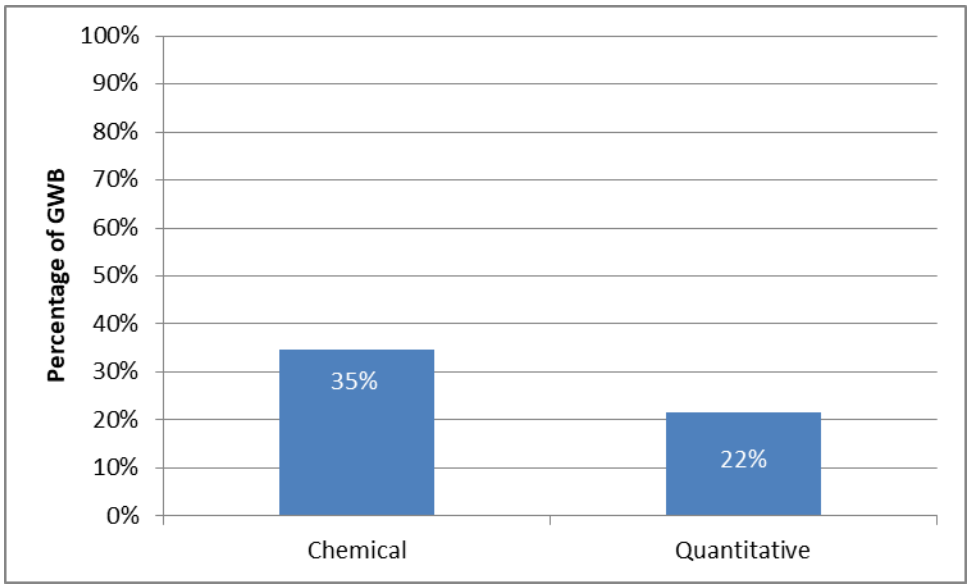
Topic 6 Monitoring, assessment and classification of chemical status of groundwater bodies

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 Italy is 1052 (Table 2.2). In total 524 (50 %) groundwater bodies are not subject to surveillance monitoring (Table 5.1). 364 (35 %) groundwater bodies are at risk of failing to meet good chemical status (Figure 6.1) and 315 (30 %) are subject to operational monitoring.[76]

Figure 6.1 Percentage of groundwater bodies in Italy at risk of failing good chemical status and good quantitative status for the second RBMP



Source: WISE electronic reporting

The RBMPs and supporting background documents for the South Apennines and Padan RBDs were reviewed in more detail. Therein it is mentioned that national criteria for grouping are set in the Italian Ministerial Decree 260/2010 but there is no indication in the assessed RBMPs, that grouping of groundwater bodies was applied for monitoring and the assessment of quantitative status where monitoring was not undertaken.

[76] Italy clarified subsequently that the monitoring coverage varies widely among RBDs (e.g. in the Sardinia RBD the coverage is about 95 % of groundwater bodies and 99 % of the groundwater body area). In several RBDs new groundwater bodies had been delineated recently and monitoring sites had not been identified by the time of reporting of the second RBMPs.

Article 6 of the Groundwater Directive[77] provides for exemptions from implementing measures to prevent or limit inputs of pollutants into groundwater where surveillance monitoring or other appropriate monitoring is being carried out. The South Apennines and Padan RBMPs and supporting background documents reviewed provided no indication that this exemption was accompanied by the required monitoring.

The number of groundwater bodies increased from 847 (in seven reported RBDs) in the first RBMP to 1052 (in eight reported RBDs) in the second RBMP. 691 groundwater bodies remained unchanged since the first RBMP. The total reported groundwater body area increased by around 24 %. The groundwater body area increased considerably in the Eastern Alps RBD, the Padan RBD and the North Apennines RBD, and the Sicily RBD in comparison to the area reported for the first RBMPs[78].

A comparison with the first RBMP cannot be made as detailed information on monitoring was not available in the first RBMPs. The number of groundwater bodies with surveillance monitoring in the second RBMPs was 524 with 3353 monitoring sites and the number of operational monitoring sites is 2649 in 315 groundwater bodies. The number of monitoring sites is listed in Table 5.2.

Not all substances causing risk of deterioration in chemical status are subject to surveillance monitoring. All WFD core parameters, nitrate, ammonium, electrical conductivity, oxygen and pH were monitored in six RBDs (Eastern Alps, Padan, North Apennines, Serchio, Central Apennines and South Apennines), except for pH in the Padan RBD. There is no monitoring of WFD core parameters at all in Sardinia and Sicily RBDs[79].

6.1.2 Assessment and classification of chemical status in groundwater

Map 6.1 and Figure 6.2 display the chemical status of groundwater bodies for the most recently assessed status. It shows that 606 of 1052 groundwater bodies (58 %) were of good chemical status, 263 groundwater bodies (25 %) are failing good status and 183 groundwater bodies (17 %) are of unknown status. In terms of area this means that about 34 % are failing good chemical status. Figure 6.3 shows the confidence in status classifications. The number of

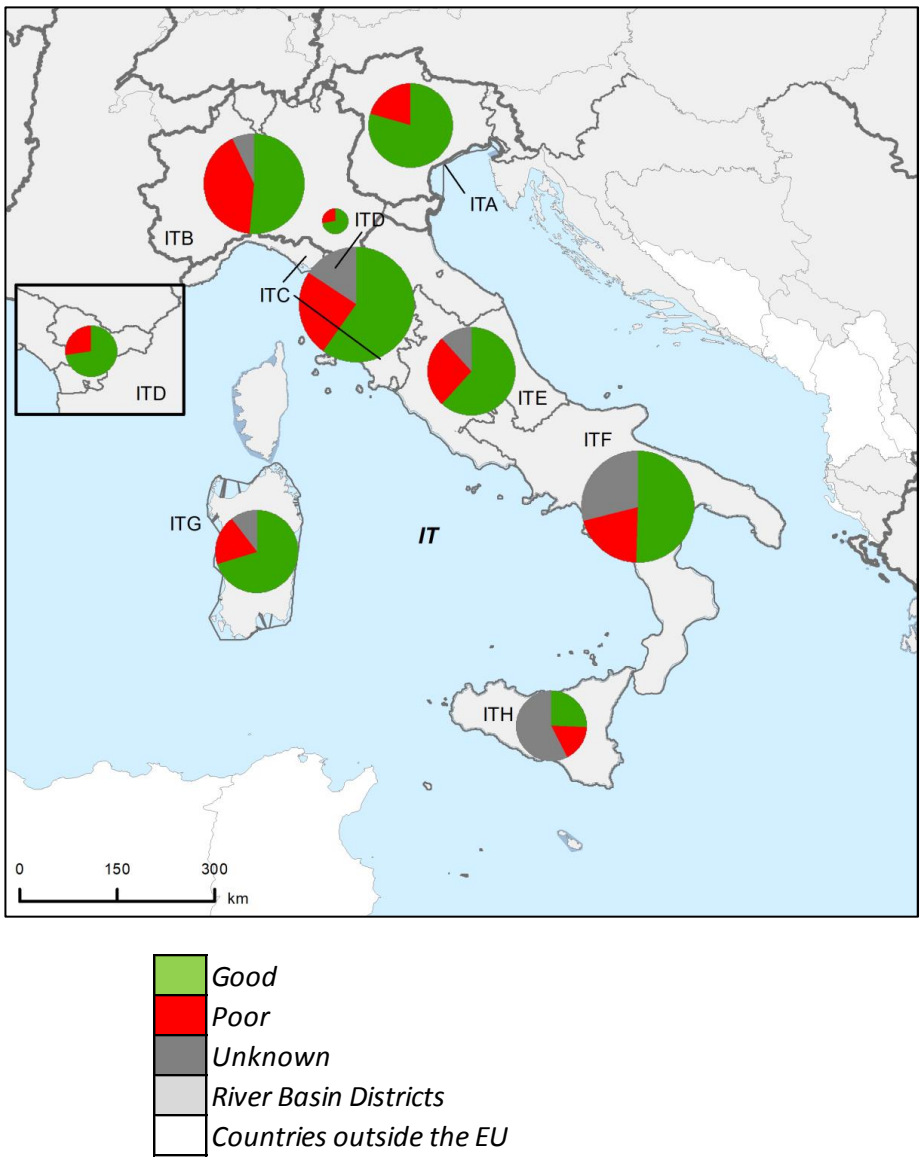
[77] Directive 2006/118/EC of the European Parliament and of the Council of 12 December 2006 on the protection of groundwater against pollution and deterioration http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:02006L0118-20140711

[78] Italy subsequently clarified that since the 1st cycle a considerable number of groundwater bodies, particularly non alluvial, had been added, especially by Regione Liguria. The concerned groundwater bodies are being monitored and will be classified in the 3rd RBMP.

[79] Italy subsequently clarified that in Sicily new data from 2016 shows that monitoring is carried out on the basis of national Legislative Decree 30/2009 and that core parameters are taken into account to assess chemical status.

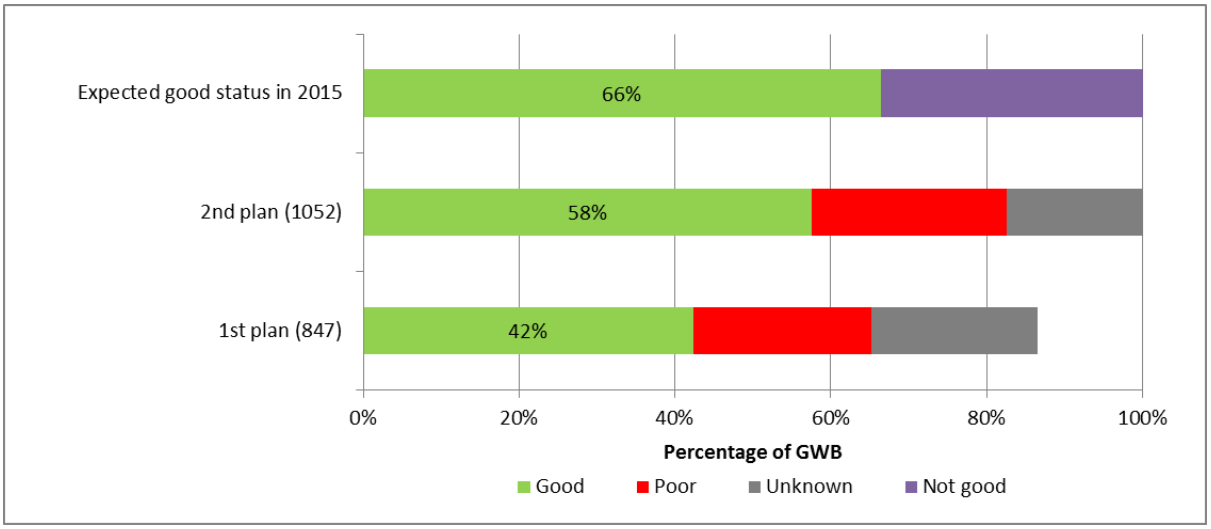
groundwater bodies in unknown status declined from 263 in the first to 183 in the second cycle.

Map 6.1 ***Map of chemical status of groundwater bodies in Italy based on the most recently assessed status of the groundwater water bodies***



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

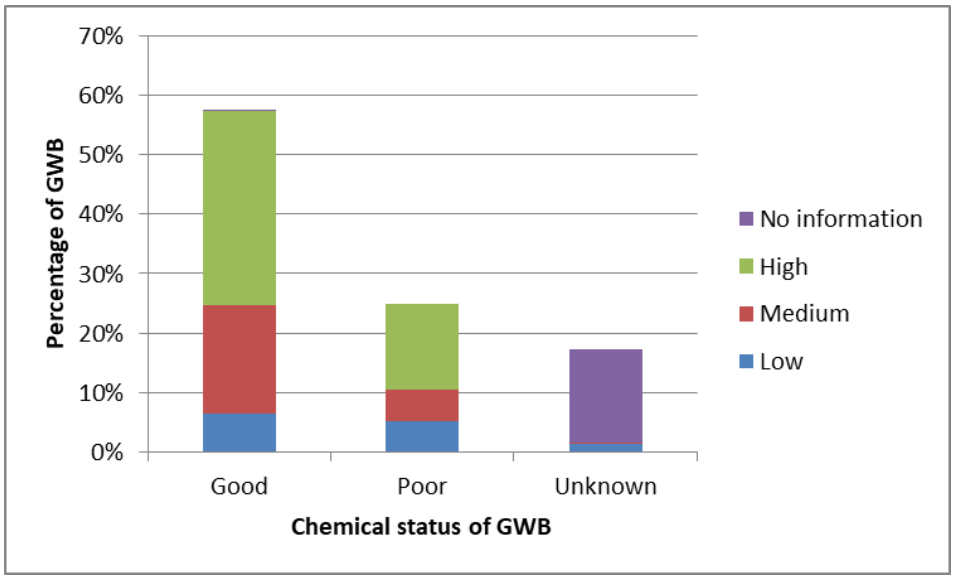
Figure 6.2 Chemical status of groundwater bodies in Italy for the second RBMP, for the first RBMP and expected in 2015. The number in the parenthesis is the number of groundwater bodies for both cycles. Note the period of the assessment of status for the second RBMP was 2007 to 2015. The year of the assessment of status for first RBMP is not known



Source: WISE electronic reporting

Note: values in figure for the first RBMP are those originally reported to WISE and do not reflect changes after the 2012 report, with the exception of the total number of waterbodies, which includes Sardinian groundwater bodies.

Figure 6.3 Confidence in the classification of chemical status of groundwater bodies in Italy based on the most recent assessment of status



Source: WISE electronic reporting

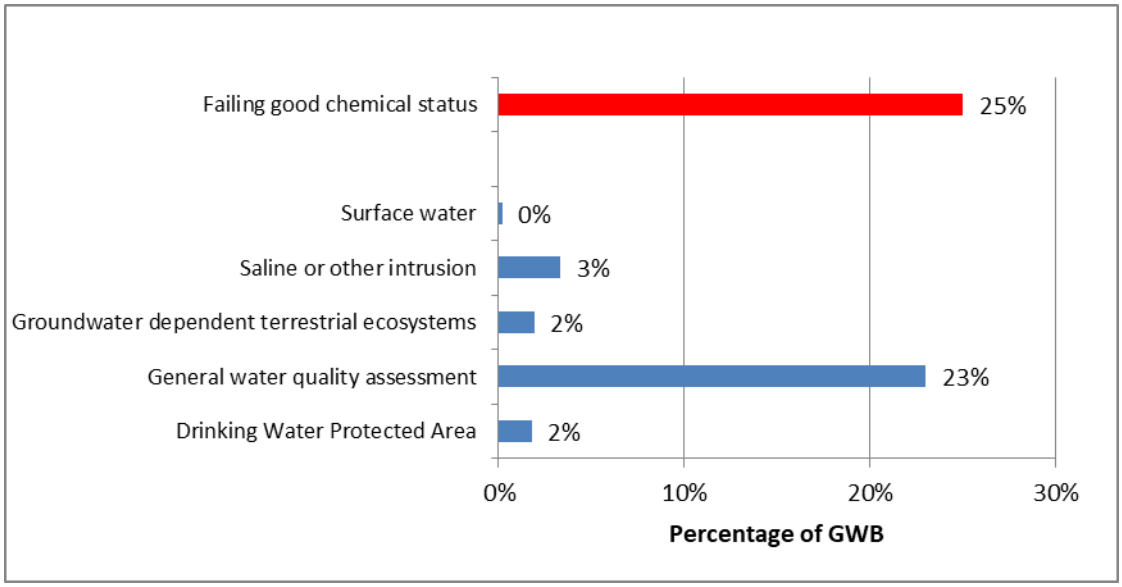
The total number of groundwater bodies failing good chemical status increased since the first RBMPs from 204 (23 %) to 263 (25 %) (Figure 6.2) (from 16.9 % to 34.1 % of the total groundwater body area). It is difficult to compare both RBMPs as the number of groundwater bodies increased by 19 % as well as the total reported groundwater body area increased by about 24 %. When comparing only the 691 unchanged groundwater bodies, the number of groundwater bodies failing good chemical status increased from 181 to 191 and the related groundwater body area increased from 20 % to 30 % of the total groundwater body area.

The reasons for the failure of good chemical status of groundwater bodies are shown in Figure 6.4. For 242 groundwater bodies the general assessment of the chemical status for the groundwater body as a whole was 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. 35 groundwater bodies are failing good chemical status due to saline or other intrusion. Figure 6.5 shows the top 10 pollutants causing failure of status and Figure 6.6 shows the pollutants causing a sustained upward trend.

In five RBDs the calculation of the extent of exceedance of a groundwater quality standard or a groundwater threshold value was based on the number of monitoring sites in a groundwater body. In two RBDs the calculation was based on the groundwater body area. For the Sicily RBD no method was reported.

In three RBDs groundwater threshold values were not established for all pollutants or indicators of pollution causing a risk of failure of good chemical status. The review of the selected RBMPs and supporting background documents did not find any indication that the Groundwater Directive Annex II substances have been considered; it was mentioned that only some substances were considered.

Figure 6.4 Reasons for failing good chemical status in Italy 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.

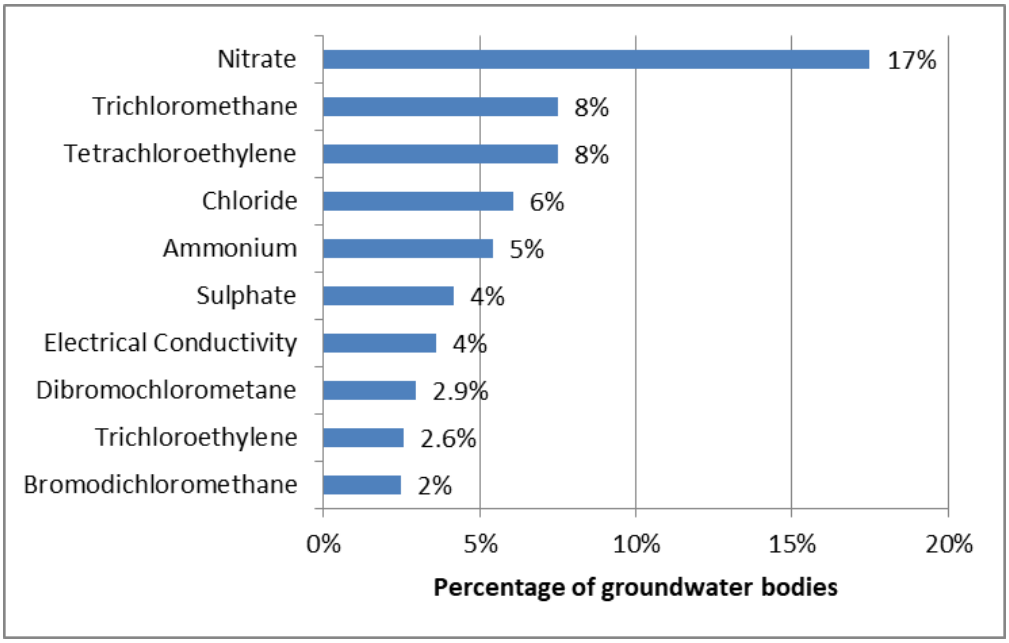
'Groundwater dependent terrestrial ecosystems' = Significant damage to terrestrial ecosystems which depend directly on the groundwater body.

'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.

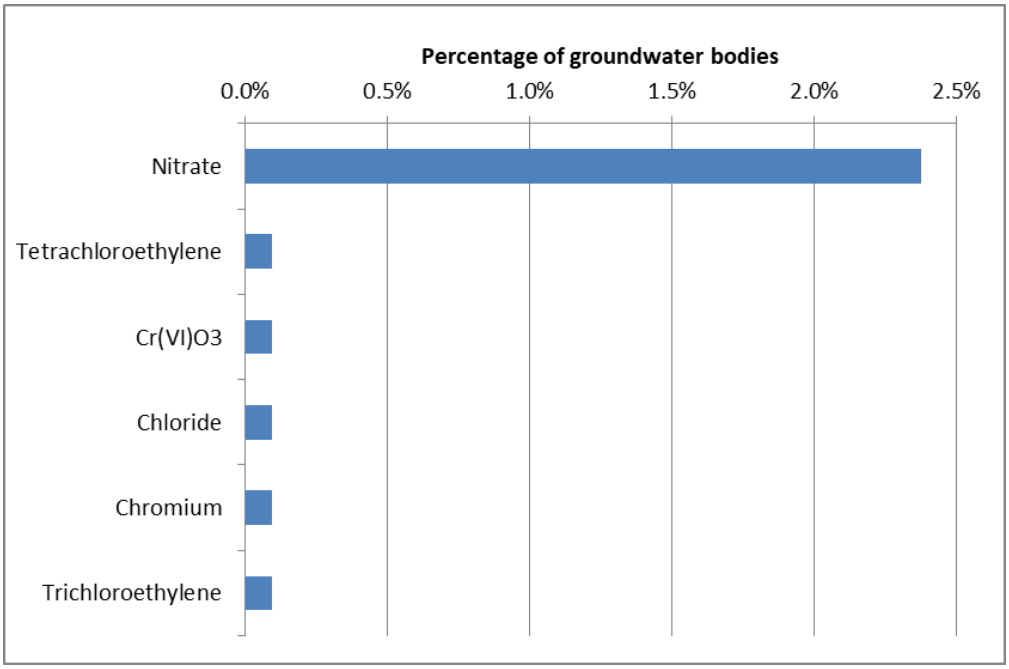
'General water quality assessment' = Significant impairment of human uses; significant environmental risk from pollutants across the groundwater body.

Figure 6.5 Top 10 groundwater pollutants causing failure of good chemical status in Italy



Source: WISE electronic reporting

Figure 6.6 Top 10 pollutants with upward trends in groundwater bodies in Italy



Source: WISE electronic reporting

In three RBDs natural background levels were considered in the development of groundwater threshold values. In three RBDs natural background levels were considered in status assessment. The RBMP for the Padan RBD noted that national methodologies needed to be

developed for the identification of natural background concentrations of substances; in the RBD two methods were used, one developed by the Piemonte Regional Environmental Agency and the other by the Agency in Emilia-Romagna Region.

A trend methodology is available and assessments have been performed in three of the eight RBDs. A trend reversal methodology was reported to be available in two RBDs[80].

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

In five RBDs (the Eastern Alps, Padan, the North Apennines, Serchio and the Central Apennines RBDs) surface water bodies were reported to be associated with groundwater bodies and they were considered in status assessment (except for the Eastern Alps RBD). In total 241 groundwater bodies were reported to be associated with surface water bodies. 69 groundwater bodies at risk in these five RBDs related to these ecosystems. Diminution of status was considered in three of the five RBDs with groundwater associated surface waters and in one RBD where such ecosystems had not been identified in reporting.[81]

In two of the eight RBDs (the Eastern Alps and Padan) groundwater dependent terrestrial ecosystems were identified (for in total 30 groundwater bodies) and a related risk was identified. In both RBDs groundwater dependent terrestrial ecosystems were considered in status assessment.

Groundwater associated aquatic ecosystems and groundwater dependent terrestrial ecosystems have been partially considered in the establishment of groundwater threshold values (in six of eight RBDs).

6.2 Main changes in implementation and compliance since the first cycle

The number of groundwater bodies increased from 847 (in seven reported RBDs) in the first RBMP to 1052 (in eight reported RBDs) in the second RBMPs. 691 groundwater bodies remained unchanged since the first RBMPs. The total reported groundwater body area increased by about 24 %.

The groundwater body area increased considerably in the Eastern Alps, Padan, North Apennines and Sicily RBDs compared to the first RBMPs[54]. Assessment of the second RBMPs

[80] Italy subsequently clarified that new national guidelines were adopted (n 161/2017) to assess trend and trend reversal. These guidelines will be implemented in the next RBMPs.

[81] Italy clarified that the reason for not considering associated ecosystems in the status assessment is the fact that the status of these ecosystems is still unknown.

(Padan and South Apennines RBDs) shows that there have been a number of changes since the first RBMPs (see Section 5.2).

A comparison of the level of monitoring between the two cycles cannot be made due to missing data from the first RBMPs. A considerable percentage of groundwater bodies are still not monitored for surveillance and operational purposes and not all substances posing risk are subject to monitoring. The coverage varies considerably between RBDs.

In the RBMPs and supporting background documents reviewed, the methods for monitoring of the chemical status of groundwater bodies were reported to be based on those set out in national legislation (D.Lgs 30/2009, which transposes the Groundwater Directive). The RBMP for the Padan RBD states that methodologies for groundwater monitoring have been further developed within individual regions and across the RBD; nonetheless, it also states that further development is needed[82].

The RBMP for the South Apennines RBD describes, for example the strengthened monitoring of nitrates and pesticides in several regions. Also monitoring and research on groundwater-dependent terrestrial ecosystems was carried out via a LIFE project in Abruzzo Region. In general, the regions have worked to bring their groundwater monitoring programmes in line with the WFD's requirements.

The RBMP for the South Apennines RBD includes specific measures for the groundwater monitoring, extending the monitoring network in several regions and strengthening coordination for groundwater bodies crossing RBD and regional boundaries.

Regarding methodologies on the identification of natural background concentrations of substances several Districts and pertaining Regions have developed a compliant methodology, for example the Piemonte Region Emilia-Romagna Region, Sardinia Region, Val d'Aosta Region, Veneto Region, Province of Bolzano, Molise Region etc.

In Italy the overall groundwater chemical status has slightly deteriorated. The total number of groundwater bodies failing good chemical status has increased since the first RBMPs from 204 (23 %) to 263 (25 %) groundwater bodies (from 16.9 % to 34.1 % of the total groundwater body area). It is difficult to compare the first and second RBMPs as the number of groundwater bodies increased by 19 % and the total reported groundwater body area increased by about 24

[82] Italy subsequently highlighted that in the Padan RBD there are measures to improve the knowledge and understanding and that there is a working group to improve the coordination and monitoring carried out by the regional Agencies, the risk analysis and the identification of substances that may put at risk the achievement of good status.

%. The total number of groundwater bodies with unknown status declined from 263 to 183 groundwater bodies. There was a significant improvement of status in the South Apennines RBD, from 19 % to 50 % [83] of the groundwater bodies achieving good status. The RBMP and supporting background documents did not provide any explanation on that, but it can be assumed that the reduction of the number of groundwater bodies with unknown status as well as the re-delineation of groundwater bodies (increase of number of groundwater bodies by 50 %) and the further development of the status assessment methodology appears to be a reason, although this is not clearly stated. The increase of the percentage of GWBs with good status is partially due to reduction of the GWBs with unknown status.

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: *The high percentage of water bodies that have an unknown status prevents effective planning and comparability with other Member States. WFD compliant assessment methods should be used taking into account the work on intercalibration.*

  Assessment: The total number of groundwater bodies of unknown status declined from 263 to 183 groundwater bodies, with differences amongst districts and regions[55]. For around 28 % of the groundwater bodies the confidence in status results is low or unknown. Therefore the recommendation has been partially fulfilled.

- Recommendation: *Monitoring is an important part of river basin planning and affects the quality and effectiveness of subsequent steps. The current monitoring gaps for BQEs, supporting quality elements and priority substances should be addressed.*

- Assessment: There has been progress, including the introduction of new methods for monitoring of chemical status at national level and their application in both RBMPs assessed; however, further work for groundwater chemical monitoring is needed. A considerable number of groundwater bodies are still not monitored for operational and surveillance purposes (grouping was applied) and not all substances posing risk are subject to monitoring.[84] Italy subsequently clarified that work is being done in the Sicily RBD to establish the monitoring of the groundwater bodies that, when completed, will lead to the

[83] Italy subsequently clarified that contrary to the WISE electronic report in fact 70 % of the groundwater bodies are achieving good chemical status in the South Apennines RBD.

[84] Italy subsequently clarified that according to Legislative Decree 30/2009 operational monitoring is compulsory for all groundwater bodies at risk and for all substances posing risk.

definition of surveillance and/or operational monitoring sites. Still 183 groundwater bodies have unknown chemical status. Therefore the recommendation has been 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

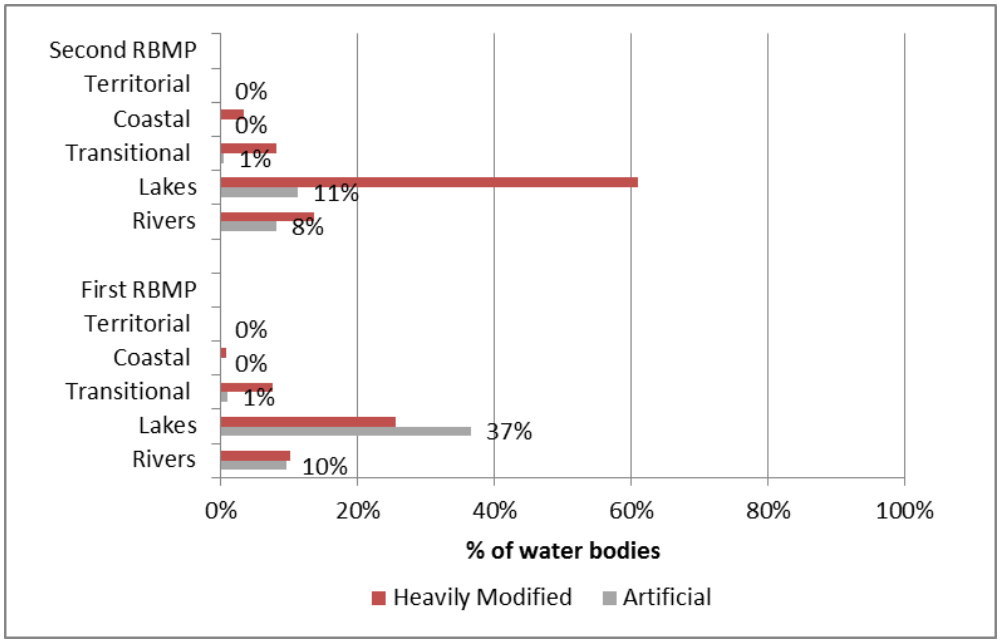
In the second RBMPs, approximately 14.8 % of surface water bodies were designated as heavily modified water bodies and 7.6 % as artificial water bodies (Figure 7.1). In the eight RBDs there were several designated lake heavily modified water bodies which are reservoirs, created by damming rivers i.e. they were originally rivers. According to Common Implementation Strategy Guidance Document No. 4[85] these should have been designated as river heavily modified water bodies. In the Eastern Alps RBD, there is one lake heavily modified water body (reservoir) which was originally a lake.

The majority of river heavily modified water bodies were designated due to flood protection, hydropower, urban development and agricultural land drainage. The water uses for which lake water bodies were designated as heavily modified are mainly hydropower, irrigation for agriculture, drinking water supply for urban use and industry supply. The most frequent uses for designating transitional heavily modified water bodies were storage for aquaculture, urban development or unknown uses. Some coastal waters were designated as heavily modified due to flood protection and navigation/ports, but for the majority there was a lack of data on the relevant uses reported.

The main physical alterations of river heavily modified water bodies were channelisation/straightening/bed stabilisation/bank reinforcement, weirs/dam/reservoirs and, in some cases, land drainage and land reclamation. Lake heavily modified water bodies are mainly connected to weirs/dam/reservoirs and transitional heavily modified water bodies to locks, weirs/dam/ reservoirs and other alterations not listed in WISE. The majority of coastal heavily modified water bodies were affected by land reclamation/coastal modifications/ports.

[85] https://circabc.europa.eu/sd/a/f9b057f4-4a91-46a3-b69a-e23b4cada8ef/Guidance%20No%204%20-%20heavily%20modified%20water%20bodies%20-%20HMWB%20(WG%202.2).pdf

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



Source: WISE electronic reporting

A national methodology for the identification of heavily modified water bodies/artificial water bodies has been developed at national level (Ministerial Decree 156/2013), and is being implemented at regional level. In some RBDs (for example, the South Apennines RBD) the 2013 national methodology for the identification of heavily modified water bodies/artificial water bodies is in the process of being implemented and the designations of heavily modified water bodies and artificial water bodies are still preliminary.

The national methodology includes criteria for identifying "significant hydromorphological modifications", also with reference to the Index of Morphological Quality. The national methodology (Ministerial Decree 156/2013) refers to an assessment of significant adverse effects, but no further specific definition of "significant adverse effects" was found. The national methodology also includes steps for assessing whether there are "other means" to achieve the beneficial objectives of the modifications linked to the heavily modified water bodies, but no further specific information of the assessment was found in the RBMPs. [86]

[86] The Ministerial Decree 156/2013 does not contain criteria to define “significant adverse effects” nor criteria to assess “other means”. Competent authorities have to carry out this evaluation. Italian authorities stated that this evaluation is currently being carried out and will be defined with a better degree of confidence after the measures on the improvement of the knowledge basis will be implemented and the current work on the Good Ecological Potential methodology that is being carried out at national level will be completed.

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

Good ecological potential was reported as not being defined in the eight RBDs. Also, the RBMPs state that a national methodology for good ecological potential has not yet been published. Assessments of ecological status have been used in the place of ecological potential (at least this is explicitly stated for some RBDs, for example, Padan) and, consequently, when a national methodology for good ecological potential is developed, status assessments of heavily modified water bodies and artificial water bodies could change. The development of national methods for the definition of good ecological potential is expected, but the RBMPs reviewed do not specify the relevant timeframe.

The Italian authorities informed the Commission of improvements after the adoption of the second RBMPs that a national methodology for good ecological potential has been developed and approved with Decree of the General Director 341/STA of 2016. It is currently been applied to all HMWBs. Italian authorities foresee to end the implementation of the methodology for good ecological potential by December 2019 at national level.

For rivers, methods for assessing fish, macrophytes and benthic invertebrates were reported as sensitive to altered habitats due to morphological and hydrological changes. In addition, one method for assessing benthic invertebrates in large wadable rivers was reported as sensitive to hydrological changes only. For lakes, methods for assessing fish and macrophytes and for coastal and transitional waters, methods for assessing angiosperms, macroalgae and phytoplankton were reported as sensitive to altered habitats due to morphological and hydrological changes. In addition, two further methods for assessing invertebrates and macrophytes in transitional waters were reported as sensitive to morphological changes only.

7.2 Main changes in implementation and compliance since the first cycle

Several changes are noted in the numbers of designations. The number of river heavily modified water bodies has substantially increased in several RBDs (especially the North Apennines, Serchio, Central Apennines and South Apennines RBDs). In the Sicily RBD, no river heavily modified water bodies were designated in the first RBMP but have been designated for the second RBMP. The numbers of river artificial water bodies have also changed with an increasing or decreasing trend in different RBDs. In the Sardinia RBD, no river artificial water bodies were designated in the first RBMP but are now designated for the second RBMP. Lake heavily modified water bodies have increased in the Central Apennines and Eastern Alps RBDs. In three RBDs (South Apennines, Sardinia and Sicily), no lake heavily modified water bodies were designated in the first RBMPs, but have been designated

for the second RBMPs. In the South Apennines RBD, no coastal heavily modified water bodies were designated in the first RBMP, but have been designated for the second RBMP.

A detailed explanation for the changes in designation since the first RBMPs is not provided but it is mentioned that the 2013 national methodology for the identification of heavily modified water bodies/artificial water bodies (Ministerial Decree 156/2013) has led to a redefinition of heavily modified water bodies/artificial water bodies. In addition, a new national approach for assessing hydromorphological pressures has been used both for natural water bodies and for designating heavily modified water bodies. In the first RBMPs, there was no national methodology in place and each region used its own approach for designating heavily modified water bodies.

As mentioned above, although the second RBMPs do not include a new methodology for defining GEP, Italian authorities informed the Commission that a national methodology for good ecological potential has been developed and approved with Decree of the General Director 341/STA of 2016.

7.3 Progress with Commission recommendations

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

- Recommendation: *The designation of heavily modified water bodies 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.*

  Assessment: There has been progress since the first RBMPs in terms of the methodology for designating heavily modified water bodies and artificial water bodies. A common national methodology has been in place since 2013 (Ministerial Decree 156/2013) and implemented in the RBMPs (although in some RBDs, implementation of this methodology is still ongoing and the designations are preliminary). The national methodology refers to the assessment of significant adverse effects and of other means to achieve the beneficial objectives of the modifications linked to the heavily modified water bodies. However, no information was found on the details of the outcome of the designation tests of significant adverse effects on the use and other means for individual water bodies. The Italian authorities have informed that this evaluation is

currently being carried out and will be defined with a better degree of confidence after the measures on the improvement of the knowledge basis will be implemented and the current work on the GEP methodology that is being carried out at national level will be completed.

Concerning the methodology of good ecological potential, a national methodology for good ecological potential was not included in the second RBMPs. However, Italian authorities informed the Commission that a national methodology for good ecological potential has been developed and approved with Decree of the General Director 341/STA of 2016.

Therefore, the recommendation has been partially fulfilled based on information included in the second RBMPs. Further improvements were communicated to the Commission, e.g. on a new national methodology for good ecological potential, which have not been assessed yet. These new developments may be addressing the recommendation to a greater extent during the third cycle.

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 of the WFD are defined in Article 4. 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[87]), groundwaters (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 status were reported for surface water bodies in all RBDs as well as for chemical and quantitative status of groundwater bodies.

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

Assessments of the current status of surface and groundwater bodies in Italy 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).

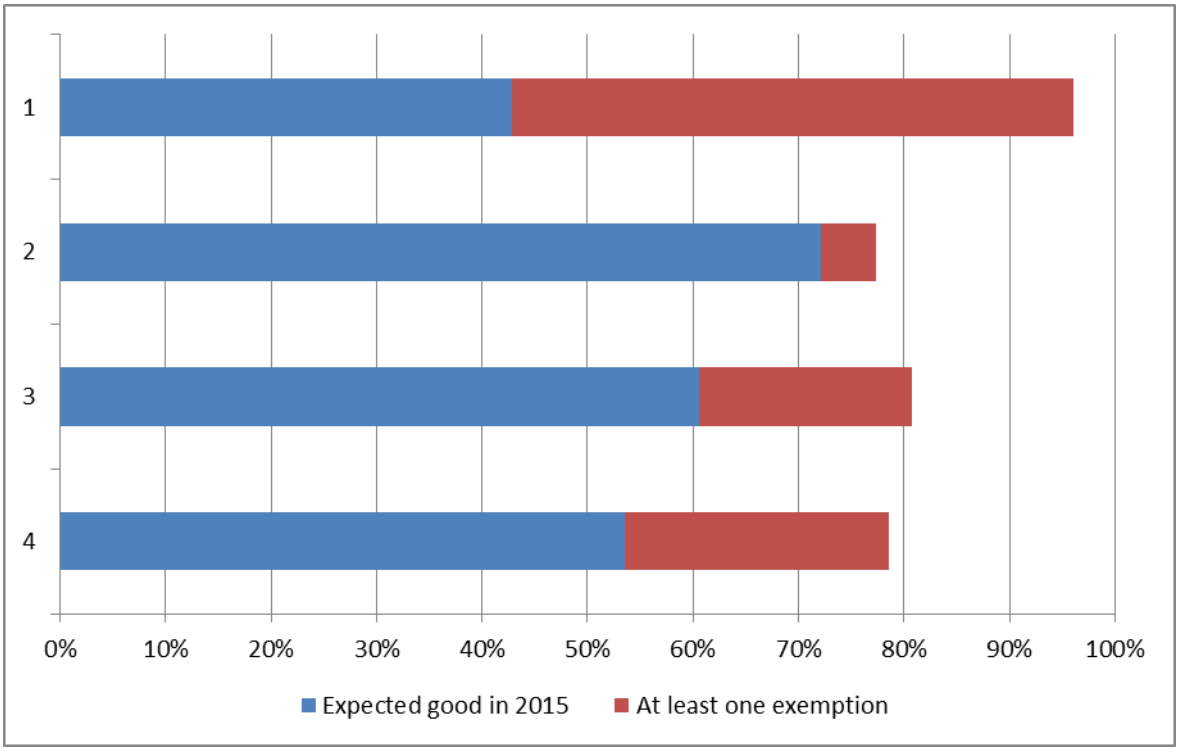
For the second RBMPs, Member States are required to report the date when they expect each surface and groundwater body to meet its environmental objective. This information is summarised for Italy elsewhere in this report: for ecological status/potential of surface waters (Chapter 3); chemical status of surface waters (Chapter 4); quantitative status of groundwater bodies (Chapter 5); chemical status of groundwater bodies (Chapter 6).

[87] 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.

8.1.2 Exemptions

Where environmental objectives are not yet achieved exemptions can 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 Italy for the four main sets of environmental objectives. Exemptions are most widely applied in relation to ecological status/potential.

Figure 8.1 ***Water bodies in Italy 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***



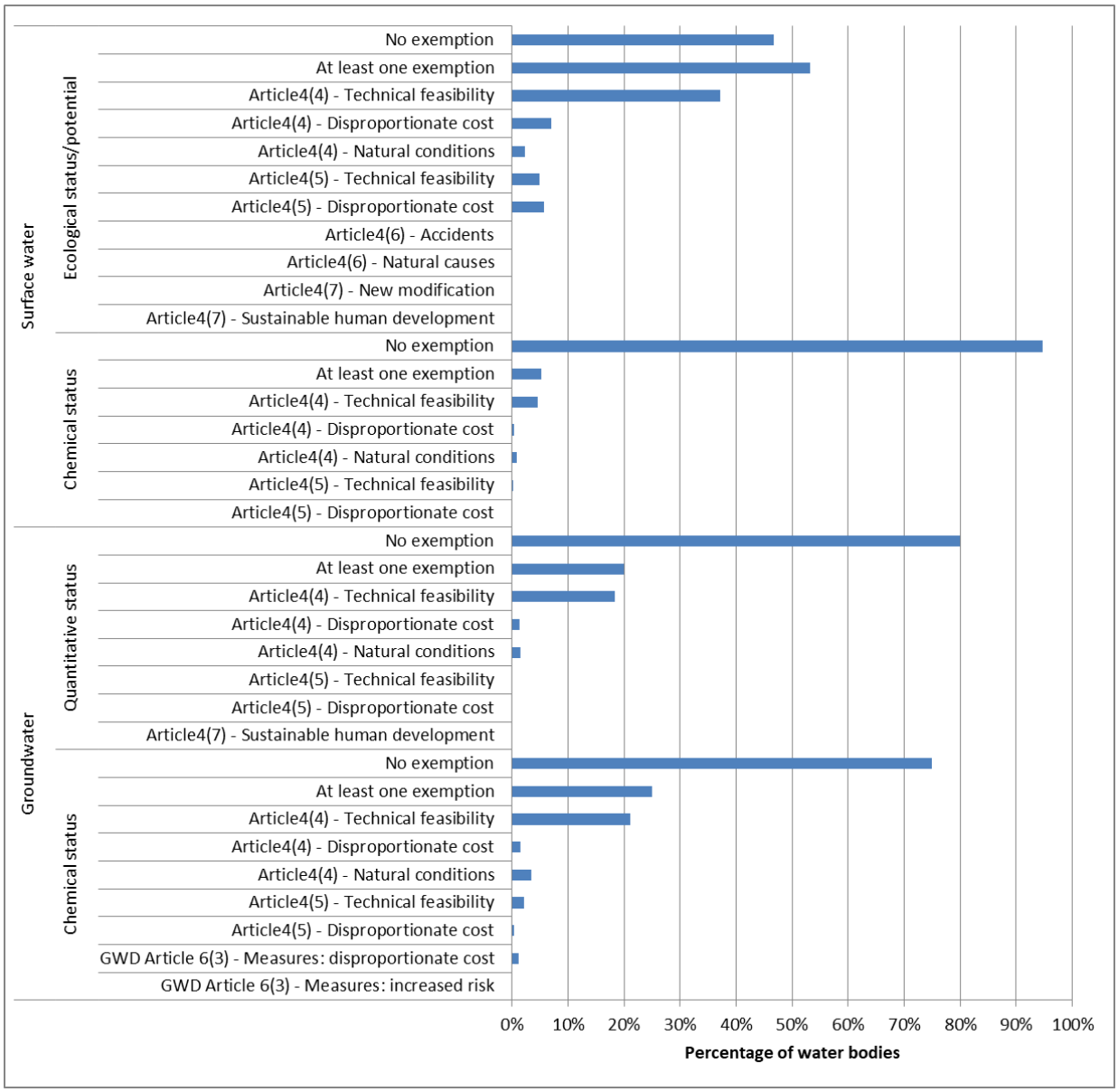
Source: WISE electronic reporting. For some water bodies the date for achievement of good status is unknown.

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 cost 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 objectives in Italy.

Figure 8.2 ***Type of exemptions applied to surface water and groundwater bodies for the second RBMP in Italy. Note: Ecological status and groundwater quantitative status exemptions were reported at the water body level. Chemical exemptions for groundwater were 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)

Overall the number of exemptions under Article 4(4) has significantly increased in all RBDs[88]. In the South Apennines, Sardinia and Sicily RBDs no exemptions related to Article 4(4) were reported in surface water in the first RBMP (Table 8.1). This has changed in the second cycle and all the RBDs were also subject to Article 4(4) exemptions. The reasons given for exemptions under Article 4(4) were technical feasibility (all RBDs), natural conditions (Eastern Alps, Padan, Central Apennines and Sardinia) and disproportionate costs (Padan, North Apennines, Serchio, and Central Apennines RBDs).

Related to groundwater in the South Apennines, Sardinia, Sicily and Central Apennines RBDs no exemptions were reported related to Article 4(4) in the first RBMP (Table 8.2). Article 4(4) is now applied in all RBDs related to groundwater in Italy with an increase in Padan RBD and the North Apennines RBD. The reasons given for exemptions under Article 4(4) were technical feasibility (all RBDs), natural conditions (Eastern Alps, Central Apennines and Sardinia RBDs) and disproportionate costs (Central Apennines RBD).

The RBMP for the Padan RBD, which was reviewed in more detail, provided a list of water bodies and the indication of when they are expected to reach good status. For those expected to reach good status in 2021 or 2027, an exemption (Article 4(4) or Article 4(5)) was applied. "Technical infeasibility" and “natural conditions” were indicated in many cases, but further details are not provided. Technical infeasibility was often assessed by expert judgement. No details were found in the RBMP for the North Apennines RBD, which was also assessed in more detail.

The justification for disproportionate costs in surface waters and groundwaters in all RBDs are based on cost benefit analysis/cost effectiveness analysis in all RBDs. In addition, the distribution of costs was used as an argument in the Padan and North Apennines RBDs. Affordability and social and sectoral impacts were also used in the Central Apennines RBD.

The impacts leading to exemptions under Article 4(4) were acidification (Sardinia RBD), chemical pollution (all RBDs), damage to groundwater-dependent terrestrial ecosystems for chemical/quantitative reasons (Padan RBD), altered habitats (all RBDs), litter (the South Apennines RBD), microbiological pollution (all RBDs except Sicily RBD), nutrient and organic pollution (all RBDs), saline pollution/intrusion (North Apennines, Serchio, South

[88] Italy subsequently clarified that this is a result of more accurate monitoring activities and the definition of clearer criteria to apply exemptions on the basis of the Commission’s recommendations.

Apennines, Sardinia RBDs) and elevated temperatures (North Apennines, Central Apennines, South Apennines, Sardinia RBDs). For groundwater the impacts of the exemptions under Article 4(4) were Chemical pollution (all RBDs), alterations in flow directions resulting in saltwater intrusion (Sardinia RBD), abstraction exceeds available groundwater resource (lowering water table) (all RBDs), microbiological pollution (Padan RBD), nutrient pollution (all RBDs except Serchio RBD), organic pollution (Padan, Serchio, Central Apennines RBDs) and saline pollution/intrusion (Padan, North Apennines, Central Apennines and South Apennines RBDs).

The main drivers behind exemptions are agriculture, urban development and industry (all RBDs), climate change (the North Apennines RBD, Serchio RBD, the Central Apennines RBD, Sicily RBD), energy production (all RBDs except the South Apennines RBD, Sicily RBD), fisheries and aquaculture (Eastern Alps RBD, Padan RBD , the North Apennines RBD, Serchio RBD, and Sardinia RBD), flood protection (all RBDs except Sicily RBD), forestry (the North Apennines RBD), tourism (Padan RBD , the North Apennines RBD, Serchio RBD) and transport (all RBDs except the South Apennines RBD and Sardinia RBD).

Table 8.1 Pressures on surface water bodies responsible for priority substances in Italy failing to achieve good chemical status and for which exemptions have been applied

Significant pressure on surface water bodies	Failing Priority Substances	Article 4(4) - Technical feasibility exemptions	Article 4(4) - Disproportionate cost exemptions	Article 4(4) - Natural conditions exemptions	Article 4(5) - Technical feasibility exemptions	Article 4(5) - Disproportionate cost exemptions
	Number					
1.1 - Point - Urban waste water	26	161	14	40	6	
1.2 - Point - Storm overflows	11	38		12		
1.3 - Point - IED plants	17	89	10	38		
1.4 - Point - Non IED plants	12	57	2	23		
1.5 - Point - Contaminated sites or abandoned industrial sites	20	117	28	28	2	
1.6 - Point - Waste disposal sites	10	35		26	1	
1.7 - Point - Mine waters	2	3		3		
1.9 - Point - Other	9	44				
2.1 - Diffuse - Urban run-off	24	152	29	29		
2.10 - Diffuse - Other	12	31	2			
2.2 - Diffuse - Agricultural	27	164	8	58	5	6
2.3 - Diffuse - Forestry	4	3	3			
2.4 - Diffuse - Transport	9	59	11	10		
2.5 - Diffuse - Contaminated sites or abandoned industrial sites	12	49	3	13	2	
2.6 - Diffuse - Discharges not connected to sewerage network	2	5		1		
2.7 - Diffuse - Atmospheric deposition	7	18		17		
2.8 - Diffuse - Mining	4	56		56		
2.9 - Diffuse - Aquaculture	8	33		33		
3.1 - Abstraction or flow diversion -	2	10		7		

Significant pressure on surface water bodies	Failing Priority Substances	Article 4(4) - Technical feasibility exemptions	Article 4(4) - Disproportionate cost exemptions	Article 4(4) - Natural conditions exemptions	Article 4(5) - Technical feasibility exemptions	Article 4(5) - Disproportionate cost exemptions
	Number					
Agriculture						
3.2 - Abstraction or flow diversion - Public water supply	2	7		7		
3.3 - Abstraction or flow diversion - Industry	7	18		7		
4.1.1 - Physical alteration of channel/bed/riparian area/shore - Flood protection	3	7		3	2	
4.1.2 - Physical alteration of channel/bed/riparian area/shore - Agriculture	3	4		2	5	
4.1.3 - Physical alteration of channel/bed/riparian area/shore - Navigation	6	8				
4.1.4 - Physical alteration of channel/bed/riparian area/shore - Other	3	2			3	
4.1.5 - Physical alteration of channel/bed/riparian area/shore - Unknown or obsolete	10	56		56		
4.2.3 - Dams, barriers and locks - Drinking water	1			1	1	
4.2.4 - Dams, barriers and locks - Irrigation	1	1				
4.2.9 - Dams, barriers and locks - Unknown or obsolete	2	7		7		
4.3.2 - Hydrological alteration - Transport	2	2				
4.3.4 - Hydrological alteration - Public water supply	1			1	1	
4.3.6 - Hydrological alteration - Other	2	10		10		
4.4 - Hydromorphological alteration - Physical loss of whole or part of the water body	1	1				

Significant pressure on surface water bodies	Failing Priority Substances	Article 4(4) - Technical feasibility exemptions	Article 4(4) - Disproportionate cost exemptions	Article 4(4) - Natural conditions exemptions	Article 4(5) - Technical feasibility exemptions	Article 4(5) - Disproportionate cost exemptions
	Number					
4.5 - Hydromorphological alteration - Other	7	14		5	5	
7 - Anthropogenic pressure - Other	6	27	14			
8 - Anthropogenic pressure - Unknown	14	123	9	7		
9 - Anthropogenic pressure - Historical pollution	8	1			15	6
No significant pressure	2	5				

Source: WISE electronic reporting

Table 8.2 Pressures responsible for pollutants in Italy 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) - Disproportionate cost	Article 4(4) - Natural conditions	Article 4(4) - Technical feasibility	Article 4(5) - Disproportionate cost	Article 4(5) - Technical feasibility
1.1 - Point - Urban waste water	4		3	5		
1.3 - Point - IED plants	24	6		66		
1.5 - Point - Contaminated sites or abandoned industrial sites	67	6	44	350	25	8
1.6 - Point - Waste disposal sites	39			71	20	10
1.9 - Point - Other	19		2	35		2
2.1 - Diffuse - Urban run-off	54			246	40	5
2.10 - Diffuse - Other	30		2	121		
2.2 - Diffuse - Agricultural	53		49	315	25	11
2.4 - Diffuse - Transport	8	8		4		
2.5 - Diffuse - Contaminated sites or abandoned industrial sites	29		45	52		
2.6 - Diffuse - Discharges not connected to sewerage network	2	1	1	1		
3.1 - Abstraction or flow diversion - Agriculture	6		14	23		12
3.2 - Abstraction or flow diversion - Public water supply	5		5	9		2
3.3 - Abstraction or flow	12		18	25		5

Significant pressure on groundwater	Number of failing pollutants	Number of exemptions				
		Article 4(4) - Disproportionate cost	Article 4(4) - Natural conditions	Article 4(4) - Technical feasibility	Article 4(5) - Disproportionate cost	Article 4(5) - Technical feasibility
diversion - Industry						
3.5 - Abstraction or flow diversion - Hydropower	3		2	2		
3.6 - Abstraction or flow diversion - Fish farms	4		2	3		
3.7 - Abstraction or flow diversion - Other	12		23	31		
6.1 - Groundwater - Recharges	2		2			
8 - Anthropogenic pressure - Unknown	37		1	89	5	1
9 - Anthropogenic pressure - Historical pollution	1	7				

Source: WISE electronic reporting

Application of Article 4(5)

There was an increase in Article 4(5) exemptions in the Eastern Alps and Central Apennines RBDs for surface water.

In the second RBMP Article 4(5) was also newly applied to surface water bodies in the Padan, North Apennines, Serchio, Central Apennines and South Apennines RBDs. The reasons given for Article 4(5) were technical feasibility (Eastern Alps, Padan, North Apennines, Central Apennines, South Apennines RBDs) and disproportionate costs (Padan, North Apennines, Serchio, and Central Apennines RBDs).

The RBMP for the Padan RBD, which was assessed in more detail, provided a list of water bodies and the indication of when they were expected to reach good status. For some water bodies reaching good status in 2021 or 2027 Article 4(5)) was also applied, which requires a more detailed assessment as Article 4(5) allows for lower objectives than good status.

Article 4(5) exemptions in relation to groundwater were only reported in the North Apennines and Serchio RBDs in the first RBMP. In the second RBMP Article 4(5) exemptions to groundwater good chemical status were applied in Eastern Alps, Padan, North Apennines and South Apennines RBDs. The reasons given for Article 4(5) were technical feasibility Eastern Alps, Padan and South Apennines RBDs) and disproportionate costs (Padan and North Apennines RBDs).

In the RBMP for the North Apennines RBD for surface water bodies disproportionate costs were the main justification for an exemption under Article 4(5). For the definition of disproportionate costs, the methodology used followed the national guidelines[89].

The impacts causing exemptions under Article 4(5) were acidification (Padan RBD), chemical pollution (all RBDs except Sardinia and Sicily), damage to groundwater-dependent terrestrial ecosystems for chemical/quantitative reasons (Padan RBD), altered habitats (all RBDs except Sardinia and Sicily), litter (South Apennines RBD), microbiological pollution (Padan, North Apennines, Serchio and South Apennines RBDs), nutrient and organic pollution (all RBDs except Sardinia and Sicily), saline pollution/intrusion (North Apennines, Serchio and South Apennines RBDs) and elevated temperatures (Eastern Alps, North Apennines and South Apennines RBDs). For groundwater the impacts of the exemptions under Article 4(5) were chemical pollution (Eastern Alps, Padan, North Apennines RBDs), abstraction exceeds

[89] "Linee guida per la definizione del costo ambientale e del costo della risorsa per i vari settori di impiego dell'acqua, in attuazione degli obblighi di cui agli articoli 4,5 e 9 della Direttiva comunitaria 2000/60/CE"

available groundwater resource (lowering water table) (North Apennines RBD), microbiological pollution (Padan RBD), nutrient pollution (Padan and North Apennines RBDs), organic pollution (Padan RBD) and saline pollution/intrusion (Padan, North Apennines and South Apennines RBDs). The main drivers were agriculture (Eastern Alps, Padan, North Apennines, Serchio, Central Apennines and South Apennines RBDs), urban development (Eastern Alps, Padan, North Apennines, Serchio, Central Apennines and South Apennines RBDs) industry (Eastern Alps, Padan, North Apennines, Serchio and South Apennines RBDs), climate change (North Apennines, Serchio, Central Apennines RBDs), energy production (Eastern Alps, Padan, North Apennines and South Apennines RBDs), fisheries and aquaculture (Eastern Alps, North Apennines RBDs), flood protection (all RBDs except Sardinia and Sicily), forestry (North Apennines RBD), tourism (North Apennines, Serchio RBDs), transport (Eastern Alps, Padan, North Apennines and Serchio RBDs). These drivers lead to pressures such as point and diffuse pollution, over abstraction, physical alterations, hydrological alterations in surface water and point and diffuse pollution in groundwater. Also, abstraction in groundwater was reported as a pressure.

Application of Article 4(6)

Article 4(6) exemptions were not applied.

Application of Article 4(7)

Article 4(7) exemptions were not reported. The RBMP for Padan RBD includes an Annex (Allegato 5.1 dell'Elaborato 5) on the application of Article 4(7). Almost all of this short annex represents a textbook presentation of the requirements under the WFD, but the last page briefly discusses the procedures followed in the RBD for this cycle. It indicates that projects for "difesa del suolo" - strictly translated as soil protection and often referring to anti-sprawl measures, but also used in Italy as a broad concept that can include flood and landslide protection among other actions - would have been assessed under Article 4(7). However, only projects in Metropolitan Area Plans and those agreed between regional and national level were considered. Drinking water and commercial navigation projects would also have been considered - the latter only when included in national or regional plans. According to this Annex, Article 4(7) was not applied for tourism navigation, road and railroad infrastructure or hydroelectric projects for the second RBMP. The information does not indicate, however, whether any projects were actually assessed under Article 4(7).

Application of Article 6(3) of the Groundwater Directive

In the North Apennines RBD Groundwater Directive[90] Article 6(3) exemptions were reported in WISE, but Italy subsequently clarified that this was a reporting error, as this exemption has not been applied.

8.2 Main changes in implementation and compliance since the first cycle

Overall the number of exemptions under Article 4(4) has significantly increased in all RBDs. Also related to Article 4(5) exemptions there is an increase in the Eastern Alps RBD and the Central Apennines RBD for surface water. In the South Apennines RBD, Sardinia RBD and Sicily RBD no exemptions related to Article 4(4) and Article 4(5) were reported in surface water in the first RBMP. This situation changed in the second cycle plans with all RBDs also subject to Article 4(4) exemptions. In the second cycle Article 4(5) has now been applied in the Padan, North Apennines, Serchio, Central Apennines and South Apennines RBDs.

Related to groundwater in the South Apennines, Sardinia, Sicily and Central Apennines RBDs no exemptions were reported related to Article 4(4) and Article 4(5) in the first RBMP. Article 4(4) is now applied in all RBDs related to groundwater in Italy. Article 4(5) in relation to groundwater was only reported in the North Apennines and Serchio RBDs in the first RBMP. In the second RBMP, Article 4(5) has now been applied in the Eastern Alps, Padan, North Apennines and South Apennines RBDs.

8.3 Progress with Commission recommendations

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

- Recommendation: *Apply exemptions in a more transparent manner and the reasons for the exemptions should be clearly justified in the second RBMPs cycle, in particular in relation to the technical infeasibility and the disproportionate costs. The absence of objectives in some RBDs is problematic and should be addressed.*

  Assessment: The recommendation has been partly implemented. The reasons for exemptions are shown at the water body level. However, the level of information provided behind the justification of exemptions varies a) depending on the reason, and b) depending on the different RBDs.

[90] 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

- Recommendation: *Provide in the RBMPs information on the actual application of Article 4(7) (there is no instance of application reported) because a high number of new hydropower projects have been authorised in Italy during the past five years and the RBMPs have included some general explanations about how a few regions would apply Article 4(7). The effects of new hydropower plants on ecological status should be properly assessed. All conditions for the application of Article 4(7) in individual projects must be included and justified in the RBMPs as early in the project planning as possible.*

- Recommendation*: It is unclear whether there are new physical modifications planned. Ensure proper implementation of the exemption under Article 4(7) for projects liable to cause status deterioration or prevent the achievement of good status. The effects of new hydropower plants on ecological status should be properly assessed and, if relevant, all conditions of Article 4(7) should be met.*

  Assessment: The recommendations have not been implemented in the second RBMPs. Italy did not report the application of Article 4(7) in its second plans. However, from the information reported it seems that there were cases in which Article 4(7) should have been applied. It is apparent that the requirements set out by Article 4(7) have not been followed and potential impacts on the status of water have not been assessed.

  Italy subsequently informed the Commission that new Directives for the ex-ante evaluation of the water derivations and for the transition from Minimum Vital Flow to Ecological Flows have been adopted to address the Commission's recommendations on the first RBMPs. These guidelines also include guidance on the assessment of new hydropower plants on the ecological status.

Topic 9 Programmes of measures

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

The Key Types of Measure (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 Measure for the purpose of reporting. The same individual measure can be part of more than 1 Key Type of Measure because it may be multi-purpose, but also because the Key Types of Measure are not completely independent silos. Key Types of Measure 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 Measure are listed in the WFD Reporting Guidance 2016.

The Key Types of Measure 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. For surface water and groundwater, KTMs were reported for all significant pressure types causing failure of objectives. However, for the Padan RBD, the North Apennines RBD, Serchio RBD, the Sardinia RBD and Sicily RBD the KTMs were not

linked to specific substances causing failure neither in surface waters nor in groundwaters in the reporting in WISE.

Italy has mapped 2 351 national basic measures against 21 of the pre-defined KTMs and 16 nationally derived KTMs. 28 % of the national basic measures have been mapped against KTM1 - Construction or upgrades of wastewater treatment plants with a further 17 % mapped against KTM14 - Research, improvement of knowledge base reducing uncertainty. Some, but not all, measures apply in all eight RBDs. Italy has also mapped 824 national supplementary measures against 23 pre-defined KTMs and 10 nationally derived KTMs. 25 % of the national supplementary measures have been mapped against KTM14 - Research, improvement of knowledge base reducing uncertainty. All the types of basic measures required by Article 11(3) have been covered.

Links to documents on Article 11(3)(c-k) basic measures are provided in WISE, including several regional documents for the Central Apennines RBD. The inventory of national basic measures is provided in WISE. Both of these provide information for all RBDs, including Sicily.

KTMs are mapped against national measures in all eight RBDs; some nationally derived KTMs are included in the Padan, Serchio, Central Apennines, and a large number in the Sicily RBD.

Where information is available on tackling significant pressures, all pressures are covered by KTMs mapped against national measures. A small number of measures are mapped in the Eastern Alps, Central Apennines and Southern Apennines even if they are not reported to be tackling significant pressures. Therefore it is not clear if these are relevant or will be made operational.

The percentage of water bodies not expected to achieve good status/ potential by 2027 has been marked with “no information” for all significant pressure types and individual substances on groundwaters and surface waters in the Eastern Alps, Padan and Sardina RBDs. For the other four RBDs percentages ranging from 0, 0-10, 10-20 % and in a few cases >50 % were reported (mainly for diffuse agricultural pollution in the Central Apennines RBD groundwater and surface water),

KTMs have been mapped against River Basin Specific Pollutants and substances respectively in surface water and groundwater for two RBDs[91] only (the Eastern Alps and Central Apennines).

The number of water bodies failing objectives due to substances in groundwater has been reported for the Eastern Alps, Padan, Central Appenines, Northern Appennines, Sicily and Sardinia RBDs, whilst the number of water bodies failing objectives due to River Basin Specific Pollutants in surface water has been reported for Eastern Alps, Central Appennines and Sardinia.

Similarly, KTMs have been mapped against priority substances in surface water for three RBDs only[92] (the Eastern Alps, Central Apennines and Southern Apennines), whilst the number of water bodies failing objectives due to priority substances in surface water has been reported for the same RBDs plus Sardinia.

Several priority substances causing failure of objectives have not been mapped against KTMs, i.e. two of a total of 13 in the Eastern Alps RBD, four of eight in the Central Apennines RBD and five of 15 in the Southern Apennines RBD; and there is no information for the 13 priority substances causing failure of objectives in Sardinia.

Italy reported quantitative indicators and gap values, as well as KTM indicators and values for significant pressures (including individual chemical / priority substances) on groundwater and surface water for four RBDs (the Eastern Alps, Central Apennines, Southern Apennines and Sardinia) with variable levels of information. Whilst the pressures are listed, including chemical substances on groundwater and surface water for the other four RBDs (Northern Appenines, Padan, Serchio and Sicily), no gap analyses were reported for these. The Annex 0 document for the Padan RBD states that the reason for this is "insufficient knowledge and no standard methodology". The Annex 0 for the Serchio RBD states "Pressure indicators used by Regione Toscana in updating pressures - impacts are different from those required" and for the KTM indicators "the Plan did not identify any KTM indicators".

For the Eastern Alps RBD for groundwater and surface water bodies, all gap indicators were provided as the number of water bodies affected by pressures, and measure indicators were

[91] Italy subsequently clarified that KTMs have been mapped against RBSP for all RBDs. However, this is not reported in WISE.

[92] Italy subsequently clarified that KTMs have been mapped against priority substances in surface water for all RBDs. However, this is not reported in WISE.

given as the number of water bodies requiring measures; gap values were reported for 2015 and 2021 (none for 2027) and expected gap reductions were modest or negligible.

For the Northern Apennines RBD for groundwater and surface water the gap indicator was "Estimation indicator of the ecological gap defined for the PdG Appennino Settentrionale, with reference to the water bodies affected by the selected pressure that causes the non-achievement of the good state". Gap values were reported for 2015, 2021 and 2027 – for most pressures the expected gap reduction is greatest in the 3rd cycle. The gap is not expected to be closed for any pressure by 2027.

For the Central Apennines RBD for groundwater and surface water gap indicators were mainly provided as the number of water bodies failing environmental quality standards and measure indicators as the number of water bodies requiring measures; gap values were reported for 2015, 2021 and 2027; expected gap reductions were modest or negligible by 2021, but all closed by 2027 for groundwaters, but for surface waters many gaps were not expected to be closed by 2027. Some pressures had no gap analyses.

For the Southern Apennines RBD for groundwater and surface water bodies, various gap indicators were used, for example, number of contaminated sites, biological oxygen demand, nitrogen or phosporous reductions in tonnes/year; and for measure indicators for example, area of agricultural land requiring to be covered by measure, % reduction in water consumption. Gap values were reported for 2015, 2021 and 2027; some but not all gaps were expected to be closed by 2027. Some pressures had no gap analyses.

For the Sardinia RBD for groundwaters and surface waters all gap indicators were given as number of water bodies failing environmental quality standards (even for hydrological/hydromorphological issues) and measure indicators were given as number of water bodies requiring measures; gap values were reported for 2015 only, with some gap values set at 0 in 2015, no gap analyses were reported for some pressures, including all chemical substances.

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. For the first Programme of Measures no information was found on the use of cost effectiveness analysis in the selection of measures. For the second Programme of Measures no information on the use of cost-effectiveness analysis was reported for the Sicily RBD. Italy reported that qualitative cost-effectiveness analyses were carried out in the Eastern Alps and Central Apennines RBDs and that a combination of qualitative and quantitative

analyses was used in the Padan, Northern Apennines and Serchio[93] RBDs. Cost-effectiveness analysis was reported not to have been used in the Southern Apennines and Sardinia RBDs. Links to several documents were provided for each RBD which were reviewed in the RBMP and background documents to gain further information on how measures have been selected and prioritised. The conclusion of this assessment is that the RBMPs and Programme of Measures assessed do not provide information on a systematic prioritisation of measures. The RBMPs and Programme of Measures assessed do indicate that measures were identified on the basis of an analysis of pressures, but they do not provide details on the methods.

A critical factor in the success of the implementation of the Programme of Measures is the availability of funding to support the investments required. There is no information on the costs of measures for the Sicily RBD. Investment costs for the first Programme of Measures were reported separately for Article 11(3)(a) requirements (measures required to implement Community legislation for the protection of water) and Articles 11(3)(b-l), Article 11(4) and Article 11(5) (all other measures) for the Padan RBD (2009-14) and Sardinia RBD (2009-15); for Article 11(3)(a) only for the Serchio RBD (2009-15); and for the total of all measures for the Eastern Alps, Northern Apennines and Central Apennines RBDs (2009-15); costs for the Southern Apennines RBD were reported as "0".[94]

For the second RBMP investment and annual costs were presented separately for Article11(3)(a) and Articles 11(3)(b-l), 11(4) and 11(5) for the Eastern Alps RBD (2015-21) and Sardinia RBD (2016-21); depreciation was not included in any calculations. For the Serchio RBD investment and annual costs were presented for Article 11(3)(a), and "0" for Articles 11(3)(b-l), 11(4), and 11(5); and for the Central Apennines RBD only Article 11(3)(a) investment costs were reported (2015-21 no depreciation costs for both). The Southern Apennines RBD did not report any investment or annual costs – in the Annex 0 document for this RBD it stated that the data were not available. The Padan RBD and the Northern Apennines RBD have some figures reported but not all, and they also refer to Annex 0.

European Union investment funding figures were presented for the first RBMPs as follows: 0 for the Eastern Alps and Serchio RBDs; while figures were provided for the Central Apennines (for the Umbria Region), for the Southern Apennines RBD and for Sardinia. No information was provided for the Padan and Northern Apennines RBDs – in the Annex 0 documents for these RBDs it was stated that the data were not available. Some of the figures reported seem

[93] Italy subsequently clarified that also for the Southern Appennines RBD a combination of qualitative and quantitative analyses has been used.

[94] Italy subsequently clarified that cost-effectiveness analyses have been performed in 6 RBDs (not in the Southern Appennines and no information for Sicily).

erroneous in that the order of magnitude (i.e. millions of Euro) seems to be missing. Links to a large number of documents were provided for each RBD.

No clear overall financial commitment has been secured for the implementation of the second Programme of Measures in any of the RBDs[95]. On a sectoral basis, commitments have been secured for agriculture in all RBDs except the Northern Apennines RBD (and is considered not to be relevant in Serchio); for urban in all except the Northern Apennines, and; for flood protection in the Eastern Alps and Southern Apennines (not relevant in Serchio or Sardinia). All others are marked "no" or "not applicable".

There has been no joint consultation on the RBMPs and the Marine Strategy in any of the eight RBDs; but coordination of the preparation of the RBMPs and Programme of Measures with the Marine Strategy Framework Directive[96] was reported for the Eastern Alps and Sardinia RBDs, and an assessment of the need for additional measures was reported for the Padan and Northern Apennines RBDs, where additional measures for chemicals and nutrients were considered necessary ("others" also in the Northern Apennines RBD). There was no information on any of the other issues relating to the Marine Strategy Framework Directive. National/RBD specific measures that are relevant to the Marine Strategy Framework Directive, the relevant basic measure types and numbers of basic measures were listed for seven RBDs (none for Sicily). Links to documents are available for seven RBDs (none for Sicily).

There is no information for Sicily on the integration or coordination between the RBMP and the Flood Risk Management Plan. The RBMPs and Floods Directive[97] Flood Risk Management Plans have been integrated in one RBD (the Northern Apennines); (i) a joint consultation of RBMPs and Flood Risk Management Plans was carried out in all other RBDs except Sardinia; (ii) the objectives and requirements of the Floods Directive were considered in the second RBMPs and Programme of Measures in the seven RBDs; (iii) win-win measures in terms of WFD objectives, drought management and use of Natural Water Retention Measures have been included in the Programme of Measures of the seven RBDs; (iv) 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 except the

[95] Italy subsequently stated that most RBDs have clear financial commitments to ensure coverage for the implementation of the second Programmes of Measures. The RBDs Eastern Alps, Northern Apennines and Sardinia identify funding sources, sectorial planning, public funds (European and national) and tariffs. Other RBDs identified the main public funds (European and national) and the most relevant planning tools.

[96] 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

[97] 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

Northern Apennines; (v) financial commitments have been secured in the Eastern Alps and Central Apennines RBDs (marked “not relevant” in the Serchio and Sardinia RBDs); and (vi) WFD Article 9(4) has not been applied to impoundment for flood protection in any of the seven RBDs. Links to documents with further information have been provided for the seven RBDs.

9.1.2 Measures related to other significant pressures

Information on “Other significant pressures” has been reported for three RBDs only, i.e. for groundwater and surface water in the Eastern Alps and Central Apennines RBDs, for surface water only in the Northern Apennines RBD.

Other pressures relate to “Anthropogenic pressures - unknown in groundwater and surface water in the Eastern Alps and Central Apennines RBDs, “Anthropogenic pressures - historical pollution in the Eastern Alps, and Anthropogenic pressures - other in the Eastern Alps and Northern Apennines RBD. Introduced species and diseases and exploitation of animals and plants were reported for surface water in the Eastern Alps and Northern Apennines RBDs.

Measures involve mainly KTM14 – Research, improvement of knowledge base reducing uncertainty, but in the Eastern Alps RBD also KTM18 - Control of alien species, and KTM6 - Improve hydromorphological conditions.

Gap indicators and measure indicators were reported for 2015 and 2021 (none for 2027) for the Eastern Alps, with modest improvements by 2021. For the Central Apennines gap indicators and measure indicators were reported for 2015, 2021 and 2027, with all gaps expected to be closed by 2027. For the Northern Apennines gap indicators were also reported for 2015, 2021 and 2027, but no measure indicators were provided and with no information on expected improvements (no gap closures).

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 Key Types of Measure. Key Types of Measure 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 Key Types of Measure, 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 Key Types of Measure in Italy. 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 Italy

Key Type of Measure	National basic measures	National supplementary measures	Number of RBDs where reported
KTM1 - Construction or upgrades of wastewater treatment plants	649	19	8
KTM10 - Water pricing policy measures for the implementation of the recovery of cost of water services from industry	27	7	7
KTM11 - Water pricing policy measures for the implementation of the recovery of cost of water services from agriculture	43	10	8
KTM12 - Advisory services for agriculture	20	33	8
KTM13 - Drinking water protection measures (for example, establishment of safeguard zones, buffer zones etc)	58	14	7
KTM14 - Research, improvement of knowledge base reducing uncertainty	392	204	8
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	115	5	8
KTM16 - Upgrades or improvements of industrial wastewater treatment plants (including farms).	30	10	7
KTM17 - Measures to reduce sediment from soil erosion and surface run-off	48	22	7
KTM18 - Measures to prevent or control the adverse impacts of invasive alien species and introduced diseases	11	6	4
KTM2 - Reduce nutrient pollution from agriculture	78	58	8
KTM20 - Measures to prevent or control the adverse impacts of fishing and other exploitation/removal of animal and plants		1	1
KTM21 - Measures to prevent or control the input of pollution from urban areas, transport and built infrastructure	72	4	7
KTM22 - Measures to prevent or control the input of pollution from forestry		11	2
KTM23 - Natural water retention measures	80	21	7
KTM24 - Adaptation to climate change	35	31	7
KTM3 - Reduce pesticides pollution from agriculture.	89	38	8
KTM4 - Remediation of contaminated sites (historical pollution including sediments, groundwater, soil)	31	6	8
KTM5 - Improving longitudinal continuity (for example, establishing fish passes, demolishing old dams)	43	11	8

Key Type of Measure	National basic measures	National supplementary measures	Number of RBDs where reported
KTM6 - Improving hydromorphological conditions of water bodies other than longitudinal continuity	182	86	8
KTM7 - Improvements in flow regime and/or establishment of ecological flows	90	41	8
KTM8 - Water efficiency, technical measures for irrigation, industry, energy and households	198	90	8
KTM9 - Water pricing policy measures for the implementation of the recovery of cost of water services from households	28	13	7
KTM100 - Regolamentazione - Attività istituzionali	3	2	1
KTM101 - Regolamentazione - Misure per ridurre i prelievi		1	1
KTM102 - Regolamentazione - Misure di tutela ambientale	2	2	1
KTM103 - Strutturali - Attività istituzionali	3	1	1
KTM104 - Strutturali - Misure per ridurre i prelievi	1		1
KTM105 - Strutturali - Misure di tutela ambientale	4		1
KTM106 - Strutturali - Monitoraggio	6		1
KTM107 - Strutturali - Misure per ridurre i carichi diffusi	1		1
KTM108 - Studi e ricerche - Misure per ridurre i prelievi	1		1
KTM109 - Studi e ricerche - Misure di tutela ambientale	1		1
KTM110 - Studi e ricerche - Monitoraggio	2		1
KTM111 - Vigilanza e controllo - Misure di tutela ambientale	1		1
KTM112 - Vigilanza e controllo - Monitoraggio		1	1
KTM113 - Campagna informative - Misure di tutela ambientale	1		1
KTM114 - Campagne informative - Monitoraggio		1	1
KTM115 - Incentivazione - Misure di tutela ambientale	2		1
KTM116 - Monitoraggio	2		1
KTM26 - Governance	1	6	1
KTM99 - Other key type measure reported under Programme of Measures - Misure a salvaguardia delle aree protette	1	3	1
KTM99 - Other key type measure reported under Programme of Measures - Misure per fronteggiare eventi climatici eccezionali		1	1
KTM99 - Other key type measure reported under Programme of Measures - Normativa governo uso del territorio per limitazione rischio, norme PGRA-AC - Gestione deflussi con sistemi naturalistici, potenziando capacità di laminazione dei tratti naturali - Interventi di riqualificazione e potenziamento funzione naturale delle ar		65	1
Total number of Mapped Measures	**2351**	**824**	**8**

Source: Member States reporting to WISE

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

	Basic Measure Type															
Key Type of Measure	**Accidental pollution**	**Controls water abstraction**	**Cost recovery water services**	**Efficient water use**	**Habitats or Birds**	**Hydromorphology**	**IPPC IED**	**Nitrates**	**Other**	**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	1	1		4		3	2	1	2	44	88	1	1		2	526
KTM10 - Water pricing policy measures for the implementation of the recovery of cost of water services from industry	1	2	22	4			2	3		2	1		1		1	
KTM11 - Water pricing policy measures for the implementation of the recovery of cost of water services from agriculture		1	38	6				1			2		2			
KTM12 - Advisory services for agriculture	2	1	1	2		2		10		2	13		8		2	1
KTM13 - Drinking water protection measures (e.g. establishment of safeguard zones, buffer zones etc)	4	10	6	9		8	1	5	8	2	8	1	35	2	5	1
KTM14 - Research, improvement of knowledge base reducing uncertainty	79	54	25	59	9	103	2	24	22	25	25	14	40	1	80	11
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	38	3	1	2		4	10	5	9	38	7	5	4		20	10
KTM16 - Upgrades or improvements of industrial wastewater treatment plants (including farms).	2	1		3			2	1	9	12	5		3		3	3
KTM17 - Measures to reduce sediment from soil erosion and surface run-off	2	1		2		43		3			3		2		3	
KTM18 - Measures to prevent or control the adverse impacts of invasive alien species and introduced diseases						3			8							
KTM2 - Reduce nutrient pollution from agriculture	2	1		7	3	11		27	3	3	37	4	7		11	1
KTM21 - Measures to prevent or control the input of pollution from urban areas, transport and built infrastructure	2	1			3	7	1	2	9	12	24	3			3	16
KTM23 - Natural water retention measures	2	6	6	9	1	68		3			2		20	1	2	1

KTM24 - Adaptation to climate change		9	6	26		7							7	2		
KTM3 - Reduce pesticides pollution from agriculture.	2	1		4	7	7		10	15	2	50	5	13		8	
KTM4 - Remediation of contaminated sites (historical pollution including sediments, groundwater, soil)						1	1			22	2	3	1		3	
KTM5 - Improving longitudinal continuity (e.g. establishing fish passes, demolishing old dams)		1		1		33		1	8				2			
KTM6 - Improving hydromorphological conditions of water bodies other than longitudinal continuity	1	2		2		158		3	8	1	9		18	1	1	1
KTM7 - Improvements in flow regime and/or establishment of ecological flows	1	19	9	21		49		2	8		3		21		1	1
KTM8 - Water efficiency, technical measures for irrigation, industry, energy and households	1	14	7	166		7	2			4	10		4	3	1	7
KTM9 - Water pricing policy measures for the implementation of the recovery of cost of water services from households		3	20	5									3			
KTM99 - Other key type measure reported under PoM	6	9	1	4	1	20	4	9		7	9	8	8	3	7	2

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.
'Habitats or Birds' = Habitats Directive (92/43/EEC) or Birds Directive (2009/147/EC)
'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).
'Other' = Other Directives mentioned in Part A of Annex VI of the WFD.
'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 to be filled to achieve WFD objectives and the Key Types of Measure 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 waters and groundwaters, 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 Programmes of Measures was reported as ‘some measures completed’ for seven of the eight RBDs (no information for Sicily). Progress has been made by identifying significant pressures and reporting KTMs in all RBDs, and carrying out gap analyses in 7 RBDs.

One of the RBMPs examined in more detail, the Southern Apennines, provides a summary of changes and updates regarding the Programme of Measures. Also the Eastern Alps RBD provides a summary explaining the relationship between the first and second Programmes of Measures. Sicily also carried out an overview of the changes implemented in the 2nd cycle.

For the Central Apennines RBD, the RBMP does not provide a summary of changes, but the documents do explain that one key change regards the analysis of effectiveness, which will take place after the approval of the RBMP itself, when the results of the 2015 monitoring will be available to give better indications of the actual impacts and on the effectiveness of specific actions. For the Southern Apennines RBD, the new Programme of Measures explains briefly that there has been a reorganisation of the measures set out in the previous cycle, with the introduction of a limited number of measures that were originally not foreseen, to better link the measures to the pressures identified.

Most RBMPs include an analysis of pressures and gaps for the development of the Programme of Measures - this is an important change compared to the first RBMP - several RBDs reported gap analyses to WISE but three RBDs did not report any information to WISE and their Annex 0s indicated that the information was not available.

9.3 Progress with Commission recommendations

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

- Recommendation: *Many measures in the Programmes of Measures originate from other existing plans and no clear link between measures and status assessment is made.*

  Assessment: This issue may have been addressed in new legislation in five RBDs, though it is reported as "not started" in the Northern Apennines and Serchio, even if it is considered necessary. The Annex 0 for Sicily states that the Programme of Measures has not been included in the RBMP. This recommendation has been partially fulfilled[98].

- Recommendation: *Ensure that the Programme of Measures are designed on the basis of robust information on pressures and status. Uncertainties in the identification of pressures should be addressed in the second RBMP to ensure adequate measures are in place. Clear links between pressures identified and measures to be taken should be established.*

[98] Italy subsequently clarified that a clear link between the PoM and the status assessment has been made in all RBDs, including Sicily.

Assessment: This issue has been addressed to some extent by identifying significant pressures causing failure of objectives and mapping measures for these (in all RBDs except Sicily), and to a limited extent by listing KTMs tackling significant pressures (three RBDs only) and limited gap analyses (four RBDs only)[99]. This recommendation has been partially fulfilled in the Eastern Alps, Central Apennines, Southern Apennines and Sardinia RBDs. It has not been fulfilled in the other RBDs.

- Recommendation: *Ensure improved information on costs of measures in the second RBMPs cycle. The selection of measures should be based on a cost-effective analysis. Transparent information should be reported in the second RBMPs on the expected effectiveness of the measures in terms of status improvements.*

  Assessment: Some cost information for basic measures has been provided for all except the Sicily RBD, and some cost-effectiveness analyses have been performed in five RBDs (none in the Southern Apennines and Sardinia, no information for Sicily). Limited information is provided on the link between measures and status improvements, although gap analyses have been carried out for four RBDs. This recommendation has been partially fulfilled in the Eastern Alps, Central Apennines, Southern Apennines and Sardinia RBDs. No progress has been made in Sicily and some steps towards progress have been made in the other RBDs[100].

- Recommendation: *Meaningful information regarding the scope, the timing and the funding of the measures should be included in the Programme of Measures so the approach to achieve the objectives is clear and the ambition in the Programme of Measures is transparent. All the relevant information on basic and supplementary measures should be included in the summary of the Programme of Measures to ensure transparency on the planned actions for the achievement of the environmental objectives set out in the WFD.*

  Assessment: There is no clear information on scope, timing and funding of measures, except very limited information through gap analyses (in the Eastern Alps, Central Apennines, Southern Apennines and Sardinia only). This was further examined in the RBMP and background documents, where it was found that none of the RBMPs/Programme of Measures assessed contained information on the timelines and funding for specific measures. The Programme of Measures for the Eastern Alps RBD

[99] Italy subsequently stated that this issue has been addressed by identifying significant pressures causing failure of objectives and mapping measures for these, and by listing KTMs tackling significant pressures in all RBDs.

[100] Italy subsequently clarified that cost-effectiveness analyses have been performed in 6 RBDs (not in the Southern Apennines, no information for Sicily).

has a chapter on the economic analysis, which presents the estimated investment, management and maintenance costs for broad groups of measures, the estimated funding needs and the sources of financing available. Sources of funding were divided into three categories: European Union, national and local (presumably government) funding; and tariffs. The Programme of Measures for the Central Apennines contained some funding data in the detailed Programme of Measures by region: for example, the Programme of Measures for the Tuscany Region set out 'financing assigned' for existing plans, such as relevant measures under the RDP for Tuscany (for example, in Table 3.2 of the Programme of Measures for Tuscany). An overview of funding sources and priorities for the RBD was not found, however. The Programme of Measures of the Southern Apennines only mentioned funding with regard to some measures being financed through European Union Funds[101]. Some progress has been made, but this recommendation has yet to be fully addressed.

- Recommendation: *Ensure that the Programme of Measures are adequately funded and will be implemented to ensure reaching the objectives of good status. Italy should look into and rely on all available sources of funding, including European Union funds.*

  Assessment: No clear overall financial commitment has been secured for the implementation of Programme of Measures in any of the RBDs, although some sectoral commitments have been secured in some RBDs. Estimated European Union funding figures were reported for six RBDs (0 for Serchio and no information for Sicily). This recommendation has been partially addressed.[102]

- Recommendation: *Set out in the second RBMPs cycle which basic and supplementary measures are necessary to achieve good status. This gap analysis can then be used to justify exemptions where necessary.*

  Assessment: Basic and supplementary measures have been included in all RBMPs. The Eastern Alps, Central Appennines, Southern Appennines and Sardinia have made

[101] Italy subsequently informed that progress has been made through gap analysis (Eastern Alps, Central Apennines, Southern Apennines, Sardinia and Padan RBDs), with a specific methodology developed by the Northern Apennines RBD. The Northern Apennines, Padan and Sardinia RBDs describe for each measure the planning process and the tools that ensure clear cost coverage and timing of the sectorial European and local funded programmes. Therefore measures are associated with sources of funding.

[102] Italy subsequently explained that most of the RBDs have clear financial commitments to ensure coverage for the implementation of the 2nd Programme of Measures. The Eastern Alps, Northern Apennines and Sardinia RBDs identify funding sources, sectorial planning, public funds (European and national) and tariffs. Other RBDs listed the main public funds (European and national) and most relevant planning tools.

progress in the use of gap analysis and links between measures and significant pressures[103]. This recommendation has been partially addressed.

[103] Italy subsequently clarified that the Northern Apennines RBD applies a complete gap analysis, with links between pressures, status and clear indicators of improvement.

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 pressure was reported as relevant for several RBDs in Italy, namely the Padan, Central Apennines, South Apennines, Sardinia and Sicily RBDs; and a proportion of groundwater bodies face water quantity-related issues for achieving good quantitative status of groundwater bodies in several RBDs, including the North Apennines RBD (25 %) and Serchio RBD (9 %).

Water abstraction pressures were reported to affect surface water bodies in different RBDs, including the North Apennines RBD (28 %) and Serchio RBD (10 %). The Water Exploitation Index + is calculated for all RBDs. For Sicily RBD, two different figures are provided (18.7 and 35.1 %) for the 2009-2013 period (for this indicator, the warning threshold of 20 % distinguishes a non-stressed from a water scarce region, with severe scarcity occurring it exceeds 40 %). The Padan RBD reports July 2010 as the worst month regarding Water Exploitation Index +[104]. No water quantity data were reported to support the European State of the Environment Report in relation to Water Quantity. Water scarcity is not considered an issue at the international level. The RBMPs include a water resource allocation and management plan, in all RBDs except Sicily RBD, which is the RBD with the highest Water Exploitation Index +.

10.1.2 Main uses for water consumption

Data were reported for the uses of water consumption, and they vary significantly throughout the RBDs. It should be noted that in particular for groundwater use, there were only a few metered uses; and in general the data submitted are based on estimates, surveys, assimilated from statistics, other methods not defined or are not available. Given the significant pressure from water abstraction, the provided datasets would appear to be lacking. In the Sicily RBD, the RBD with the highest Water Exploitation Index +, agricultural groundwater use (46 %) and surface water use (9.2 %) was reported as the most significant pressure.

[104] Italy subsequently clarified that reporting mistakes had taken place and indicated that WEI+ values reflect water stress also in the Padan and North Apennines RBDs, especially during the summer period.

10.1.3 Measures related to abstractions and water scarcity

Regarding basic measures (Article 11(3)(e)), in Italy there is a concession, authorisation and/or permitting regime to control surface and groundwater abstractions and water impoundment; and a register of impoundments exists in all RBDs except Sicily, thus adding uncertainty to the data being used for analysing pressures. Small abstractions are exempted from controls in the Eastern Alps RBD, and do not require permits but are registered in the North Apennines and Serchio RBDs[105]. It should be noted that both RBDs, and in particular the North Apennines RBD presented a large number of water bodies (both groundwater and surface water) that do not achieve the WFD objectives due to water quantity-related pressures.

Measures related to Article 11(3)(c) for efficient and sustainable water use were implemented in most of the RBDs (the Eastern Alps, Padan, the North Apennines, Serchio RBD, the South Apennines RBD, and Sardinia RBD) in the previous cycle, and new measures and/or significant changes have been planned for the 2016-2021 period. For the Central Apennines RBD however, no new measures or significant changes were reported to be planned. In Sicily RBD no measures were implemented in the previous cycle, which might reflect non-compliance with the requirements of the WFD to take appropriate measures to reduce the pressures. However, new measures have been planned for the 2016-2021 period.

According to the Central Apennines RBMP, there are three measures promoting efficient and sustainable water use in the Programme of Measures of Central Apennines. However, they only address the mechanisms and not necessarily water management practices:

- Implementation and strengthening of the water accounting system (following Ministerial Decree 39/2015)
- Definition of homogeneous criteria for regulating the quantification of the volumes of water used for irrigation by end users (following Ministerial Decree 31/07/2015)
- Definition of specific water use targets (per capita and per unit of product) for different uses in order to incentivise savings and efficiency at different territorial scales.

According to the Sicily RBMP, all measures adopted in the first RBMP have been confirmed for the second cycle (i.e., they are being continued); however, this statement is in contradiction with the reporting, which refers to no measures having been implemented during the first

[105] Italy subsequently clarified that only small groundwater abstractions for single household's uses do not require permits but must be registered (Royal Decree n.1775/1933, art.93). In addition, in the Northern Apennines RBD the Water Balance Plan foresees an additional, more restrictive measure which imposes further abstraction limits for the above described small abstractions.

RBMP. In the Programme of Measures, there are several measures planned to control abstractions (withdrawals). The majority of measures fall within the 'regulation' typology:

Measures linked to KTM7- "Improvements in flow regime and/or establishment of ecological flows":

- Definition of the Minimum Vital Flow for all RBDs to ensure an acceptable ecological flow
- Definition and application of management practices for the regulation of outflows in dry periods, including through the revision of existing plans
- Review of the procedures for granting or renewing abstraction concessions, taking into account the definitions of water balance and the Minimum Vital Flow
- Management of water withdrawal and release systems in surface water bodies, through the monitoring network and through the reduction of volumes granted with the aim to ensure protection of the environment and optimisation of production processes.

Measures linked to KTM8 - "Water efficiency, technical measures for irrigation, industry, energy and households":

- Identification of a gradual reduction of groundwater withdrawals for integrated water supply systems
- Management of land use aimed at increasing effective infiltration in the recharge areas of aquifers.
- Application of best agricultural practices, including crop substitution with more resistant species, and the application of more efficient irrigation techniques.

Measures linked to KTM8- "Water efficiency, technical measures for irrigation, industry, energy and households", KTM9- "Water pricing policy measures for the implementation of the recovery of cost of water services from households", KTM10- "Water pricing policy measures for the implementation of the recovery of cost of water services from industry" and KTM11- "Water pricing policy measures for the implementation of the recovery of cost of water services from agriculture":

- Introduction of economic and financial mechanisms and definition of procedures for the review of concession fees, in order to reduce resource waste and incentivize the installation and maintenance of meters

Other measures:

- Review and update of the business plan of Siciliacque (water supply company) to comply with Legislative Decree 152/2006 and adapt it to the RBMP.

Three measures under the 'supervision and control' typology are planned, linked to KTM13- "Drinking water protection measures (for example, establishment of safeguard zones, buffer zones etc.)":

- Strengthening controls on groundwater abstractions in risk areas;
- Strengthening controls over public water abstractions;
- Strengthening controls over abstractions from private wells for domestic use, with reference to the annual water balance.

Four measures are planned under the 'incentives' typology, linked to KTM 8 - "Water efficiency, technical measures for irrigation, industry, energy and households":

- Intervention for the promotion of water savings in agriculture, including through the rationalisation of withdrawals, reduction of leakages in the irrigation distribution network, introduction of sustainable irrigation methods and introduction of advanced monitoring and remote control systems.
- Intervention for the promotion of water savings in industry through the rationalisation of withdrawals, through the issuance of restrictive opinions on the amount of flows that can be withdrawn or through the definition of voluntary actions.
- Optimisation of the use of resources with incentives for reuse through specific agreements.
- Application of best agricultural practices, including crop-substitution with resistant species, and the application of more efficient irrigation techniques.

Only one structural measure is planned, linked to KTM 8 - "Water efficiency, technical measures for irrigation, industry, energy and households":

- Interventions to reduce leakages and improve maintenance of distribution networks.

Measures for the prior authorisation of artificial recharge or augmentation of groundwater bodies (Article 11(3)(f)) were implemented in most of the RBDs (Eastern Alps, Padan, North Apennines, Serchio, South Apennines and Sardinia RBDs) in the previous cycle, and new measures and/or significant changes have been planned for the 2016-2021 period. For the Central Apennines RBD however, no new measures or significant changes were reported to be planned. In the Sicily RBD no measures were implemented in the previous cycle, but new measures have been planned for the 2016-2021 period.

Complementary measures under KTMs were reported for addressing abstraction pressures, and refer to KTM 6 - "Improving hydromorphological conditions of water bodies other than longitudinal continuity", KTM 7 - "Improvements in flow regime and/or establishment of ecological flows", KTM 8 - "Water efficiency, technical measures for irrigation, industry, energy and households", KTM 9 - "Water pricing policy measures for the implementation of the recovery of cost of water services from households", KTM 10 - "Water pricing policy measures for the implementation of the recovery of cost of water services from industry", KTM 11 - "Water pricing policy measures for the implementation of the recovery of cost of water services from agriculture", KTM 12 - "Advisory services for agriculture", KTM 13 -" Drinking water protection measures (for example, establishment of safeguard zones, buffer zones etc.)" and KTM 14 - "Research, improvement of knowledge base reducing uncertainty".

However, no KTMs were reported as planned for the Padan RBD[106], the North Apennines RBD and Sicily RBD, with the North Apennines RBD having a significant number of groundwater bodies in poor status due to abstraction pressures and Sicily RBD (again, the reporting for Sicily RBD does not reflect the measures included in the RBMP). Water pricing (KTM 9 - "Water pricing policy measures for the implementation of the recovery of cost of water services from households", KTM 10 - "Water pricing policy measures for the implementation of the recovery of cost of water services from industry", KTM 11 - "Water pricing policy measures for the implementation of the recovery of cost of water services from agriculture") addresses urban, industrial and agricultural uses, but has not been reported as planned for the North Apennines RBD and Sicily RBD. KTM 24 (Adaptation to Climate Change) was only included in the RBMP of Sardinia RBD.

The Programme of Measures of the Central Apennines RBD only included KTMs related to water use efficiency and Ecological Flows.

[106] Italy subsequently clarified that KTMs were reported and planned for the Padan RBD and are linked to the measures of the Water Balance Plan (Pillar 3) that also concern groundwater bodies.

Water reuse was foreseen as a measure in the North Apennines RBD, Serchio RBD, the Central Apennines RBD, South Apennines, Sardinia RBD and Sicily RBD. The Central Apennines RBD is also an important water exporter, without further information being provided on the benefiting RBD(s). The Sicily RBD also uses desalinised water.

10.2 Main changes in implementation and compliance since the first cycle

No major changes have been identified for Italy, except for the adoption of National guidelines to the Regions on the methodologies for the quantification of volumes of water used for irrigation. Once implemented, these can be used as a mechanism to promote knowledge and better management of water abstraction pressures.

10.3 Progress with Commission recommendations

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

- Recommendation: *Enforce in the second RBMPs cycle the implementation of metering to all abstractions. Users should report consumption regularly to river basin authorities. This information should be used for the preparation of future RBMP updates.*

  Assessment: In the first RBMP, abstraction for agriculture was reported as a significant pressure for about 16 % of water bodies (though analysis was not complete): this is an issue in nearly all RBDs. Metering was not used extensively in irrigation. Unauthorised abstractions were an issue in some regions. The monitoring obligation is implemented in general by regional regulation but metering does not appear to be used regularly for fish farming or hydropower[107], though it is mandatory for household uses and for industrial uses. The RBMPs themselves did not provide detailed information on the extent of metering in different sectors or services, nor on inspections and other compliance actions related to metering.

  Whilst the RBMPs assessed refer to measures to strengthen controls of abstractions, neither of the second RBMPs assessed (The Central Apennines RBD and Sicily RBD) provide explicit information on the extent to which metering is in place for users. The second RBMPs refer to national guidelines to the regions on the methodologies for the quantification of volumes of water used for irrigation ("Linee guida per la

[107] Italy however clarified that large hydropower stations are being monitored.

regolamentazione da parte delle Regioni delle modalità di quantificazione dei volumi idrici ad uso irriguo, issued by the Ministry of Agriculture in July 2015). These guidelines call on the regions to measure volumes of water abstracted and to ensure the installation of metering where technically and economically feasible[108].

Moreover, as noted above, the Programme of Measures for Sicily RBD includes a measure for: "Introduction of economic and financial mechanisms and definition of procedures for the revision of concession fees, in order to reduce waste of the resource and to incentivise the installation and the maintenance of meters".

Italy has put in place a national policy framework to address this recommendation, and the Padan RBMP includes a measure to promote metering. However, implementation on the ground is not yet reported.

There are several measures planned to control abstractions, including one aimed at strengthening the control on groundwater abstractions in risk areas; one aimed at strengthening the control over public water abstractions; and another one aimed at strengthening control over abstraction from private wells for domestic use, with reference to the annual water balance.

In the Central Apennines RBD there are two potentially relevant measures: a) identification and implementation of specific actions to reduce the impacts due to self-provision of water resources in the district interest areas and in the Nitrate Vulnerable Zone and b) adjustment of the regime of concession fees, irrigation contributions and tariffs to self-provision, irrigation services and integrated water service of the adjustment, following the update of the economic analysis of water use.

This recommendation has been partially fulfilled.

- Recommendation: *Review systematically the abstraction permits and, if necessary, revise them, to ensure they are consistent with the environmental objectives.*

  Assessment: It cannot be assessed if this recommendation has been fully implemented. Abstraction permits typically have a duration of 30-40 years and are managed by the regions[109]. National legislation does not contain explicit provisions for the review of existing permits and concessions, including those for abstraction, in response to the

[108] Italy subsequently clarified that metering obligations for agriculture have been introduced by regional regulations in 2016.

[109] Italy subsequently clarified that the Italian Law (RD 1775/1933) establishes the length of authorisations (e.g. 15 years for industrial authorisations).

provisions of RBMPs or their objectives. Legislation does, however, include provisions to review permits on the basis of "minimum flows" (as set out in national legislation)[110].

The RBMP for the Sicily RBD states that water permits are revised through decrees at the regional level (decreti di concessione). Information could not be found regarding when and how often these revisions take place. Nonetheless, the RBMP contains a relevant measure: revision of the procedures for the granting or renewal of withdrawal authorisations, in consideration of the definitions of water balance and the Minimum Vital Flow. There is no information about how, when and how often water permits will be revised in the Central Apennines RBD, but there is one relevant measure: revision of withdrawal authorisations in line with the defined water balance.

However, there is very little information available about both the funding source and budget of the concerned specific measures, and the budget for larger measure packages seems rather short for addressing concessional reviews on a larger basis. Therefore, concerns remain on implementation.

The RBMPs include measures to review abstraction permits, and illustrate that progress towards implementing the Commission's recommendation has been made.[111]

Furthermore, in the RBMPs for both Sicily RBD and the Central Apennines RBD, no information could be found on the conditions under which permits can be refused[112].

This recommendation has been partially fulfilled.

[110] Italy subsequently clarified that a specific measure, foreseen in the RBMPs, was carried out in this context for the transition from "minimum vital flows" to ecological flows. In this regard, new directives for the evaluation ex ante of the water concessions and for the calculation of Ecological Flows were approved in each RBD.

[111] Italy subsequently clarified that according to the RD 1775/1933, it is possible to review the authorisations to conform the abstractions to the preservation of ecological flows.

[112] Italy subsequently clarified that the Italian Law regulates when requests for derivations can be rejected, based on ex-ante evaluations of environmental sustainability.

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 have not changed since the publication of the first RBMP. All RBMPs refer to agriculture as a significant pressure due to diffuse pollution[113, 114] and abstractions. Hydromorphological pressures from agriculture are cited in some RBMPs. Agricultural point sources have not been identified as an important pressure. A gap assessment for pressure reductions was only reported for nutrients in the Southern Apennines RBD.

KTM12 - Advisory services for agriculture, KTM17 - Measures to reduce sediment from soil erosion and surface run-off, KTM2 - Reduce nutrient pollution from agriculture, KTM23 - Natural water retention measures, KTM3 - Reduce pesticides pollution from agriculture are in all RBDs. KTM13 - Drinking water protection measures (for example, establishment of safeguard zones, buffer zones etc.) have been established in all RBDs, except the Northern Apennines RBD where this type of measure has not been reported[115]. Measures are of a basic (the minimum requirement to be complied with) and supplementary nature. In the Padan RBD (the RBD that has been assessed in more detail) the Programme of Measures does not explicitly state which measures are mandatory and which are voluntary at a district level, although some regions do. The Programme of Measures refers to a database of measures where such information should be available, however, the link to the database is not provided in the Programme of Measures.

In relation to KTM 13, "Drinking water protection measures (for example, establishment of safeguard zones, buffer zones etc.)" in the Padan RBD a review of the rules on safeguard areas is reported as being planned, including a review of the methodology for defining the perimeter of such areas. Moreover, the recharge areas of aquifers belonging to deep and intermediate hydro-structures are expected to be re-delineated at greater scale in order to improve the cartographic reference base for the definition of measures to protect these groundwater bodies, which is particularly important in view of their use for drinking water.

[113] The RBMP for the Padan RBD, for example, includes a detailed estimate of the nutrient load in its analysis of pressures.

[114] In the Eastern Alps RBMP, a detailed identification of pressures and impacts and a rigorous approach for defining the significance of pressures is provided, as well as a clearer link between pressures and measures.

[115] Italy subsequently stated that these KTMs are included in the Northern Apennines RBD, this might be a reporting error.

Legally binding measures taken under Article 11(3)(h) are covered in all RBDs. The implementation of basic measures under Article 11(3)(h) for the control of diffuse pollution from agriculture at source have been applied only in Nitrate Vulnerable Zones in the Sicily RBD, the Southern Apennines RBD, the Serchio RBD and the Eastern Alps RBD. In the Sardinia RBD and the Central Apennines RBD there are differentiated rules for different parts of the RBDs, and in the Northern Apennines RBD and the Padan RBD the same rules apply across the whole RBD. In all RBDs, in accordance with DM 7 April 2006 for example all the regions that fall within the river basin have regulations in place (binding controls/requirements at farm level) that address the problem of diffuse nutrient pollution (nitrates and phosphorus) outside Nitrate Vulnerable Areas, pesticides pollution, as well as organic pollution and microbial contamination.

Nitrates are covered by the general binding rules to control diffuse pollution from agriculture in all RBDs. Phosphorus is covered by the general binding rules in all RBDs except in the Serchio RBD and the Eastern Alps RBD. Pesticides are covered in the Eastern Alps RBD, the Padan RBD, the Northern Apennines RBD, the Central Apennines RBD, the Southern Apennines RBD, and Sardinia RBD[116]. Organic Pollution is covered in the Padan RBD, the Northern Apennines RBD, the Southern Apennines RBD and Sardinia RBD. Microbial pollution is covered in the Padan RBD, the Northern Apennines RBD, the Southern Apennines RBD and the Sardinia RBD.

Farmers/Farmers' Unions have been consulted under the Public Consultation process.

Financing of agricultural measures was reported as secured in all RBDs, except the Northern Apennines RBD[117]. Information on planned investments has been partly reported, as in the first RBMP.

Information on past expenditure has only partly been reported.

11.2 Main changes in implementation and compliance since the first cycle

Based on the information reviewed, Italy has made progress in introducing measures related to address agricultural pollution, including initiatives at national level as well as specific measures taken at RBD and regional level.

[116] Italy subsequently informed the European Commission that it established a national action plan for the sustainable use of phytosanitary products (i.e. pesticides).

[117] Italy subsequently stated that the Northern Apennines RBMP includes basic measures financed by the CAP and supplementary measures financed both by the Regional and National Rural Development Programmes.

11.3 Progress with Commission recommendations

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

- Recommendation: *Agriculture is indicated as exerting a significant pressure on the water resource in most Italian RBDs, both from point and diffuse source pollution from livestock raising, as well as abstractions, hydro-morphological pressures and diffuse source pollution for crops. This should be translated into a clear strategy that defines the basic/mandatory measures that all farmers should adhere to and the additional supplementary measures that can be financed. This should be developed with the farming community to ensure technical feasibility and acceptance. There needs to be a very clear baseline so that any farmer knows the rules this can be adequately advised and enforced and so that the authorities in charge of the Common Agricultural Policy funds can adequately set up Rural Development programmes and cross compliance water requirements.*

  Assessment: Agriculture is one of the four fundamental pillars for the Padan RMBP and Programme of Measures. Among the key areas of focus are protection against nitrates of agricultural origin (Directive 91/676[118]) and integration with the priorities set by the Common Agricultural Policy and the Rural Development Programmes. The Programme of Measures mentions the Commission recommendation and the bilateral meeting with the European Commission of September 2013 and explains that in March 2014, to address this recommendation, the Ministry of Agriculture, in collaboration with the Ministry of Environment, issued an 'Agriculture Action Plan - Strategic guidelines for the definition and implementation of the programmes of measures relating to the agricultural sector in the second cycle of management plans ' which constituted a general strategic approach for the preparation of the Programme of Measures for the second RBMP.

  Consequently, the RBMP and Programme of Measures indicate that they are implementing the Action Plan; while the PoM includes a range of measures to address agricultural impacts it does not clearly specify the measures or actions directly related

[118] 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

to this Action Plan[119]. The RBMP also reports that in preparation for the RBMP and Programme of Measures, the Padan RBD Authority, its regions and the Ministries of Environment and Agriculture developed a 2013 document on the 'Integration of Po RBMP measures with the 2014-2020 RDP measures': this was intended to harmonise the Programme of Measures and RDP actions related to agricultural pressures on water in the Padan RBD[120]. The PoM includes measures that are linked to national and regional RDPs, for example for the mitigation of agricultural impacts, to be correlated with RDP measures for WFD and Habitats Directive payments[121]. In summary, the RBMP and Programme of Measures for the Padan RBD indicate that priority was given and a strategic approach was taken to address agricultural pressures. The information does not indicate, however, whether this was developed with the farming community. Moreover, a baseline is not presented, nor are details – such as which Programme of Measures and which RDP measures are involved – that would show that a complete strategy is in place[122]. Whilst considerable progress has been made this recommendation has not been entirely fulfilled.

A gap assessment can only be found for nutrients in the Southern Apennines RBD. Legally binding measures taken under Article 1(3)(h) are taken in all RBDs. In the Padan RBD, there are both basic and supplementary measures linked to KTM 2 - "Reduce nutrient pollution from agriculture" and KTM 3 - "Reduce pesticides pollution from agriculture".

Annex 7.5 to the Programme of Measures presents a "Methodological proposal for an *ex-ante* evaluation of the effectiveness and of the progress of the plan" (an experimental approach to the gap analysis). The methodology proposed for the gap analysis was reported to be a starting point for future developments and to be applied during the preparation of the third cycle Programme of Measures, when the implementation of individual knowledge and governance measures of the second RBMP will have ensured a lower level of uncertainty for certain data. It is therefore not clear what contribution measures to implement the Nitrates Directive, basic measures

[119] Italy subsequently stated that to ensure that the PoM also included the actions envisaged by this Plan, a consistency analysis was carried out between the actions integrated in the Agriculture Action Plan and the individual measures of the PoM.

[120] http://pianoacque.adbpo.it/piano-di-gestione-e-agricoltura-integrazione-del-programma-di-misure/).

[121] All the measures of Pillar 2 of the PoM, but also some indicated for the other Pillars.

[122] Italy subsequently stated that to regulate and control widespread sources of pollutants of agricultural origin, a broader strategic framework is implemented at a regional level, which includes, on the one hand, the implementation of the PAN ("Piano di azione nazionale per l'uso sostenibile dei prodotti fitosanitari") and, on the other hand, the implementation of the Common Agricultural Policy, through the regional Rural Development Programmes.

under Article 11(3) of the WFD, basic measures included in Pillar 1 (GAEC, greening) of the Common Agricultural Policy and supplementary measures under Pillar 2 of the Common Agricultural Policy can make to achieve good status.

A gap analysis is included in the RBMPs and aims to:

- study in depth the relationships between the significant pressures and their magnitude, according to the percentage of water bodies yet to achieve good status and the reference KTM measures;
- provide an estimate of the relevance of the planned KTMs with respect to the number of bodies of water involved, and;
- provide the initial scenario of the financial coverage of the KTM measures planned on the basis of which it will be possible to evaluate the progress of the measures and the capacity of the system responsible for the implementation of the DQA to overcome the present and reported obstacles.

Further actions to address agricultural impacts include the implementation at regional level of the National action plan for the sustainable use of phytosanitary products (i.e. pesticides)[123] and the Programme of Measures for the Padan RBD to implement this action plan.

Italy's RBMPs also include measures to address abstraction by agriculture, including strengthening controls on groundwater abstractions, promoting water savings in agriculture and reviewing abstraction concessions (see Topic 10 for further details). Further measures address the measurement and pricing of water in agriculture, including national guidelines on methodologies for the quantification of volumes of water used and on water pricing (see Topic 14 for further details)[124].

Moreover, Italy's RBMPs include an overall analysis to link pressures and measures (see Topic 9). For the Padan RBMP, for example, this analysis is carried out at the level of individual water bodies.

[123] The National action plan was developed in the context of Directive 2009/128/EC on the sustainable use of pesticides. For further information, see: http://www.minambiente.it/pagina/piano-dazione-nazionale-pan-luso-sostenibile-dei-prodotti-fitosanitari

[124] Italy subsequently informed the European Commission that a major effort has been undertaken to implement the ex-ante conditionality of the Partnership Agreement (under Cohesion Policy) on metering of water for agricultural uses. Italy also informed the European Commission that the Padan RBMP includes several measures in this area, prepared in coordination with the measures of the national and regional Rural Development Programmes.

- Recommendation: *Introduce binding requirements for farmers to improve nutrient balances (measures oriented towards manure handling and recycling, decrease nutrients discharges, etc.).*

  Assessment: A gap assessment can only be found for nutrients in the Southern Apennines RBD. Legally binding measures taken under Article 1(3)(h) are taken in all RBDs. The implementation of basic measures Article 11(3)(h) for the control of diffuse pollution from agriculture at source apply only in Nitrate Vulnerable Zones[125]. In the Sardinia RBD and the Central Apennines RBD there are differentiated rules for different parts of the RBDs and in the Northern Apennines RBD and the Padan RBD the same rules apply across the whole RBD. Farmers/Farmers' Unions have been consulted under the Public Consultation process. This recommendation has been partially fulfilled.

[125] Italy subsequently clarified that Italian Regions were obliged to transpose into regional legislation the provisions of the national legislation that introduced compulsory obligations also in agricultural areas outside Nitrates Vulnerable Zones. These rules are as stringent as the rules detailed in the Action Programmes for Nitrates Vulnerable Zones.

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.

A total of 14 KTMs relevant to non-agricultural sources of pressures causing failure of WFD objectives were reported for Italy. These KTMs include:

KTM 1 - “Construction or upgrades of wastewater treatment plants”[126]

KTM4 - "Remediation of contaminated sites (historical pollution including sediments, groundwater, soil)"

KTM 14 - "Research, improvement of knowledge base reducing uncertainty"

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)"

KTM17 – "Measures to reduce sediment from soil erosion and surface run-off" and

KTM 21 - “Measures to prevent or control the input of pollution from urban areas, transport and built infrastructure”.

[126] Italy mentioned that since 2012 considerable sums both from national and European funds have been programmed and allocated on sewerage and wastewater sectors at national level. The total amount is estimated at approximately 2 billion Euro.

However, for the Padan RBD, the North Apennines RBD, Serchio RBD and Sicily RBD the KTMs were not linked to specific substances causing failure in the reporting in WISE.

The WFD specifies that Programmes 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. Quantitative information on basic and supplementary measures used to tackle pollution from non-agricultural sources (number of measures per KTM) has been provided for four out of eight RBDs in Italy, and includes 10 types of basic measure.

In the Programmes of Measures for the Padan and the North Apennines RBDs (which were reviewed in more detail), the measures were described in a general manner but there was not enough detail available to understand if all Priority Substances causing failure to reach environmental objectives were being addressed by these measures. The assessment showed that the most relevant measures planned to address Priority Substances were those linked to KTMs 14 and 15[127]:

Related to KTM 14, specific measures include:

- Increase knowledge about the natural background level of specific priority substances and specific pollutants;
- Increase knowledge about the pressures and loads of point and diffuse pollutants and their mechanisms of dispersal in surface and groundwater ;
- Creation of an organised and homogeneous information basis at district level for the compilation of the inventory of priority substances, and;
- Adaptation of water body monitoring plans for priority substances in accordance with Directive 2013/39[128] and for the purposes of the inventory.

For KTM15, linked measures include:

- Adjustment of the limits of quantification for the determination of priority substances;

[127] Italy subsequently clarified that the lists provided for KTM 14 and 15 are not exhaustive, as they do not take into account the complexity of measures identified to address the issue and referred also to KTM 1, 4, 13, 15 and 16.

[128] Directive 2013/39/EU of the European Parliament and of the Council of 12 August 2013 amending Directives 2000/60/EC and 2008/105/EC as regards priority substances in the field of water policy http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32013L0039

- Control of major hazard accidents associated with certain hazardous substances as defined in Directive 2012/18, and;

- Rules for discharges containing priority substances under Directive 2013/39.

In both Programme of Measures for the Padan and the North Apennines RBDs, the measures addressing River Basin Specific Pollutants were described in a general manner[129].

Italy provided more targeted information on basic measures required under Article 11(3)(c to k). Use of authorisation and/or permitting regimes to control wastewater point source discharges (Basic measures Article 11(3)(g)) was reported for all Italian RBDs for surface and groundwater. A register of wastewater discharges (Basic measures Article 11(3)(g)) was reported to be implemented in seven out of eight Italian RBDs for surface and groundwater. In the Sicily RBD there was no register of wastewater discharges reported. There are no thresholds below which wastewater discharges do not require permits and are not subject to registration in seven out of eight Italian RBDs. According to the reporting in WISE, small discharges do not require permits but are all registered in the North Apennines RBD. There is a prohibition of all direct discharges to groundwater (Article 11(3)(j)) in six out of eight Italian RBDs. Some direct discharges are authorised in accordance with Article 11(3)(j) in the Eastern Alps RBD and Sicily RBDs.

There are measures reported to be in place to eliminate/reduce pollution from Priority Substances and other substances in all RBDs in Italy.

12.2 Main changes in implementation and compliance since the first cycle

In the first RBMPs substance-specific measures (directed at 16 substances) were listed only for the North Apennines RBD, whereas for the second RBMPs KTMs were reported for significant pressures from specific Priority Substances and River Basin Specific Pollutants causing non-compliance for the Eastern Alps, Padan, North Apennines, Serchio, Central Apennines, South Apennines and Sardinia RBDs.

12.3 Progress with Commission recommendations

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

[129] Italy subsequently clarified that, for the North Apennines RBD, in addition to the RBMPs there are sub-plans (i.e. Water Protection Plans, Local Integrated Water Service Plans) which also include more detailed information on 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, and where there are exceedances how such exceedances have been taken into account in the assessment of ecological status. It is important that there is an ambitious approach to combatting chemical pollution and that adequate measures are put in place.*

  Assessment: In terms of Topic 12, the second RBMPs reported KTMs tackling chemical pollution but the links between KTMs and specific substances causing failure were not reported for several RBDs.

  This recommendation is considered partially fulfilled.

- Recommendation: *Include substance-specific as well as general measures against chemical pollution in its second RBMPs.*

  Assessment: In both RBMPs assessed (the Padan and North Apennines RBDs), general measures are planned to tackle chemical pollution (linked to KTM 15- "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 KTM14- "Research, improvement of knowledge base reducing uncertainty"). Annexed to the RBMP are a set of fact sheets for each water body where measures are listed and which also contain links to information on individual measures. From the information provided it has been concluded that this recommendation has been fulfilled.

- Recommendation: *Identify the extent of the problem from Urban Wastewater Directive in Article 5 analysis – pressures from discharge of urban wastewater - for the second RBMPs cycle (this should be clearly and transparently presented, also for small agglomerations).*

  Assessment: Use of authorisation and/or permitting regimes to control wastewater point source discharges (Basic measures Article 11(3)(g)) was reported for all Italian RBDs for surface and groundwater. A register of wastewater discharges (Basic measures Article 11(3)(g)) was reported to be implemented in seven out of eight Italian RBDs for surface and groundwater. In the Sicily RBD there was no register of wastewater discharges reported.

The gap to good status for pressures from urban wastewater treatment, which would allow an assessment of the extent of the problem, was not reported to WISE, while it seems to have been done in some RBDs. This recommendation is partly 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 significant hydromorphological pressures have been assigned to specific sectors and the dominating uses/sectors related to such pressures are flood protection, agriculture and transport. In some cases, hydromorphological pressures are not assigned to one of the specified sectors according to WISE (sector was reported as "other"). In a few RBDs (for example, the Padan RBD and Sardinia RBD), for the majority of water bodies affected by hydromorphological pressures, the specific sector linked to these pressures has been reported as either unknown/obsolete or "other".

Operational KTMs to tackle specific significant hydromorphological pressures are reported for seven of eight all RBDs (the Eastern Alps, the Central Apennines, the South Apennines, Po, North Apennines, Serchio and the Sardinia RBDs). The main operational KTMs to address significant hydromorphological pressures were KTM 5 – "Improving longitudinal continuity" (for example, establishing fish passes, demolishing old dams), KTM6 – "Improving hydromorphological conditions of water bodies other than longitudinal continuity", KTM7 – "Improvements in flow regime and/or establishment of ecological flows" and KTM14 – "Research, improvement of knowledge base".

Even if hydromorphological measures have been included in the RBMPs, these measures are not described in depth and they are not explicitly linked to a specific hydromorphological pressure, noting that it was difficult to gather knowledge on hydromorphological pressures, because data are held by bodies other than the regional governments and regional environmental agencies preparing the RBMPs. Overall management objectives in terms of restoring river continuity have been set in most of RBDs (the Eastern Alps, Padan, Serchio, Northern Apennines, the South Apennines, Sardinia RBD, Sicily RBD). In the Sardinia RBD, these objectives are also quantitative. No such objectives are set for the other RBD.

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 according to WFD Article 11(3)(i) in all RBDs. A register of physical modifications of water bodies is in place in three RBDs (the Central Apennines, the South Apennines, and Sardinia RBD).

Win-win measures in terms of achieving the objectives of the WFD and Floods Directive[130], drought management and use of Natural Water Retention Measures (NWRM) were reported as included in the Programme of Measures of all RBDs. KTM23 – "Natural water retention measures" is applied for flood protection pressures in the Eastern Alps RBD and for agricultural diffuse pollution (not related to hydromorphological pressures) in the Central Apennines RBD. Also the RBMPs of further RBDs may include references to green infrastructure and natural water retention measures. For example, the RBMP for the Padan RBD discusses the link between green infrastructure and the Floods Directive and refers to measures such as the creation of buffer strips/filter ecosystems along the natural and artificial network of plains.

The design of new and existing structural measures, such as flood defences, storage dams and tidal barriers, was reported to have been adapted to take into account WFD objectives in all RBDs, except in the Sicily RBD.

Ecological flows have been derived for all relevant water bodies only in two RBDs (the Eastern Alps and Sardinia RBD). In these two RBDs, ecological flows which have been derived have been partly implemented and the work is still on-going. In the remaining RBDs, ecological flows have not been derived. However, in the majority of them (the North Apennines, Serchio, the Central Apennines, the South Apennines and Sicily RBDs) there are plans to do so during the second cycle. In one other RBD (Padan RBD), the analysis of the Programme of Measures shows that there is one measure aimed at defining the ecological flow: 'Revision of the Minimum Vital Flow, definition of the ecological flow and control of its implementation on the territory'.

However, the analysis of the RBMPs shows that there are measures related to the definition of criteria for the derivation and regulation of the releases to ensure a Minimum Vital Flow and measures for updating the Minimum Vital Flow. Minimum Vital Flow is defined by Italian law as the flow rate to be determined in each homogeneous part of the water body that guarantees the protection of the physical, chemical-physical and ecological characteristics of the water body. Although the definition of the Minimum Vital Flow includes principles underlying the definition of ecological flow, it is not a concept identical to ecological flow. [131]

[130] 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

[131] Italy subsequently informed that new directives for the transition from Minimum Vital Flow to ecological flow have been approved for all Italian RBDs. The directives, in force from the date of approval, are primarily aimed at ensuring that the criteria for determining ecological flows guarantee full compliance with the indications expressed in the CIS Guidance Document no. 31.

Indicators on the gap to be filled for significant hydromorphological pressures and KTM value indicators were reported for 2015, 2021 and 2027 for four of the eight RBDs (the Eastern Alps, the Central Apennines, the South Apennines, and Sardinia RBD). From the information available, it was reported that there is expected to be considerable progress in closing the gap by 2021 in terms of all types of significant hydromorphological pressures (physical and hydrological alterations, continuity barriers). The gap is expected to be fully closed by 2027 except for certain continuity barriers in the Central Apennines RBD.

13.2 Main changes in implementation and compliance since the first cycle

In the first RBMPs, few water bodies were reported as being subject to significant hydromorphological pressures. Although measures to address hydromorphological pressures were included in the Programme of Measures of all RBDs, the links between these and the water use or pressure they addressed were only described in broad terms, if at all.

In the second RBMPs, as the effect of a more rigorous analysis of pressures, the proportion of surface water bodies reported to be affected by significant hydromorphological pressures has significantly increased. KTMs to tackle such pressures were reported as operational in seven of the eight RBDs. The Programmes of Measures indicate that some of the planned hydromorphological measures are amongst those that have been reviewed for the second cycle, to ensure consistency with other processes such as the Rural Development Programmes, the National Action Plan for sustainable use of water and to reinforce the synergies with the Operational Programmes financed through Cohesion Policy. Further hydromorphological measures, so called win-win measures, are as well those identified in the Flood Risk Management Plan, as they pursue both the objectives of Directive 2000/60 and those of Directive 2007/60.

13.3 Progress with Commission recommendations

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

- Recommendation: *Improve substantially the information on hydromorphological pressures for the second RBMPs. Measures should be included in the Programme of Measures to tackle hydromorphological pressures.*

  Assessment: Due to the improved WISE reporting, information on significant hydromorphological pressures in each RBD and links to sectors is more comprehensive with clear indications of the numbers of water bodies affected. The share of surface water

bodies reported as affected by significant hydromorphological pressures has significantly increased. In general, the significant hydromorphological pressures are assigned to specific sectors with a few exceptions (for example, in some cases in the Padan RBD and Sardinia RBD), where for most water bodies affected by hydromorphological pressures, the specific sector linked to these pressures is either unknown/obsolete or "other". Operational KTMs to tackle the hydromorphological pressures are reported for all RBDs. Based on the information based, this recommendation can be considered fulfilled.

- 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 water infiltration, aquifer recharge, flood protection, habitat conservation etc.), social and economic benefits which can be in many cases more cost-effective than grey infrastructure.*

  Assessment: KTM23-Natural water retention measures is applied for flood protection pressures in the Eastern Alps RBD and in the Padan RBD, and for agricultural diffuse pollution (not related to hydromorphological pressures) in the Central Apennines RBD. Also the RBMPs of further RBDs may include references to green infrastructure and natural water retention measures. For example, the RBMP for the Padan RBD discusses the link between green infrastructure and the Floods Directive and refers to measures such as the creation of buffer strips/filter ecosystems along the natural and artificial network of plains. Priority is given to the use of natural water retention measures and green infrastructure measures in the planning process, under a provision set out in the national law[132]. For example, in the RBMP for the Padan RBD, when presenting synergies with the Flood Risk Management Plans, there is clear reference to the prioritisation of green infrastructure. It is clearly stated that flood protection measures should be designed in such a way as to provide the widest possible spectrum of ecosystem services.

  Based on the information found, this recommendation has been fulfilled.

[132] Decree Law of 2014, n.133

Topic 14 Economic analysis and water pricing policies

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

On the national level, water services and uses are defined according to the Ministerial Decree 39/2015(MD 39/2015), which lists the following water services: integrated water service (drinking water abstraction and treatment and sewage collection and wastewater treatment); rainwater collection and sewerage; industrial water services, including abstraction, distribution and treatment; irrigation water abstraction, treatment and distribution; water services for the regulation of Lakes Maggiore, Como, Iseo and Garda; services for the management of reservoirs (for hydroelectricity, bathing, navigation, water sports and other); services for hydraulic protection; water services for the management of natural water courses and hydraulic works, and multi-sectoral water services (Allegato A - Annex A - of the Decree).

However, the individual RBMPs define water services differently[133]. Overall, only in some RBDs is self-abstraction included as water service. In most cases, a very narrow or narrow definition of water services is used (only the RBMP of the Padan refers to the broad definition of the Ministerial Decree 39/2015). Only for some water services, an overall cost recovery rate is given (always 100 %).

It is not clearly explained in some RBMPs if these cost recovery rates per water service are disaggregated to contributions from different water users. Also, the information on which sectors benefit from a water service (sometimes including additional ones beyond household, industry, agriculture) as well as if and how users contribute to cost recovery, differs from RBD to RBD.

Article 9(4) is indicated as being applied for navigation in three RBDs (Northern Apennines, Serchio and Southern Apennines), while water storage is indicated as a use for one RBD (Serchio). Article 9(4) used is indicated in WISE not to be used for any other water services[134].

A methodology for the calculation of environmental and resource costs is given at national level, in Ministerial Decree 39/2015 (and the guidelines attached to the decree). The Decree has introduced a cost-based approach which defines environmental and resource costs as the

[133] Italy subsequently clarified that, in accordance with Ministerial Decree 39/2015, in the RBMPs each RBD has identified water services and uses relevant for its territory on the basis of the pressure and impact analysis carried out in accordance with the WFD. Self-abstraction is taken into consideration if relevant.

[134] Italy subsequently clarified that this is a reporting mistake in WISE and that Article 9(4) has not been used.

costs of measures required to fill the gap to achieve the good water status objective. In this context, measures already in place and implemented are considered as financial costs whereas the costs of measures to be implemented to fill the gap between the actual situation and the status objective are considered as environmental and resource costs. Most RBMPs refer to this methodology, but indicate that it has not yet been applied and indicate the calculation, significance and partial internalisation for water services relevant for the District on the basis of the analysis of pressures and impacts and taking into account the affordability.

Information about incentive pricing is not included in any of the RBMPs[135].

The Polluter Pays Principle is mentioned in most RBMPs, mostly with reference to the respective national legislation (Article 119 of D. Lgs 152/2006, which inter alia transposes the WFD - this Article refers to the Polluter Pays Principle).

Volumetric pricing is partially applied in Italy. However, for irrigation the situation may vary from region to region. The Ministry of Agriculture released the "National guidelines to the Regions on the methodologies for the volume quantification of water used for irrigation", that provide for the transmission of data functional to the quantification of irrigation volumes through appropriate water meters or, where it is technically impossible or economically unfavourable, to provide for estimates through a shared estimation methodology at national level.

The economic analysis was reported as updated in six RBDs, while for two it has been "partially updated" (in Sicily and Southern Apennines).

14.2 Progress with Commission recommendations

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

- 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*

[135] Italy subsequently explained that the requirements for incentive pricing are laid down by national provisions which require financial tools to be applied to the different services and uses to incentivise the efficient use of water resources.

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.

Assessment: On the national level, water services are defined according to the Ministerial Decree 39/2015, which lists a broad range of water services. Reportedly self-abstraction is analyzed only in those RBMPs where it has a significant relevance.

However, the individual RBMPs have carried out the economic analysis for the water services considered significant in the respective River Basin Districts:

- The RBMP of the Padan refers to the water services indicated by Ministerial Decree 39/2015. Financial costs are included for integrated services for drinking water abstraction and treatment and sewage collection and wastewater treatment, calculated and the recovery rate is 100 %. The RBMP also presents a table showing connections between water services, significant water uses, potential pressures and measures to address them.

- The RBMP of the Central Apennines indicates two "other" water services ("uso civile" and "uso irriguo") in application of the provisions of MD 39/2015. Financial costs are included for the integrated water service named "uso civile" and only partially for irrigation named "uso irriguo", for both costs are calculated, leading to a cost recovery rate of 100 %.

- The RBMP of the Southern Apennines defines as water services all the activities that use the resource and/or impact the state of the water and that could prevent the achievement of the environmental objectives set by the WFD, in accordance with the provisions of Ministerial Decree 39/2015. In particular, the pressure impact analysis in accordance with the Ministerial Decree refers to three main water services: integrated water service (drinking water collection, treatment and supply and waste water collection and treatment), irrigation and industrial services. Financial costs are included, calculated and a cost recovery rate of 100 % given for drinking water abstraction/treatment/distribution and sewage collection/wastewater treatment (integrated water service) for irrigation water abstraction/treatment/distribution only partial inclusion is stated, no calculation and no cost recovery rates are provided. For industry, only partial inclusion and calculation of financial costs, no cost recovery rates provided.

- The RBMP of the Serchio RBD also reports three water services, but different ones (drinking water abstraction/treatment/distribution, irrigation water abstraction/treatment/distribution and self-abstraction). Financial costs are included and calculated only for drinking water abstraction/treatment/distribution with a cost recovery rate of 100 %, for irrigation, costs are calculated only partially, also leading to a 100 % cost recovery rate. No calculation of recovery rate for self-abstraction is given. Cost recovery for self-abstraction was not calculated because it is not relevant for the District.

- The RBMPs of the Eastern Alps and the Northern Apennines indicate five water services (drinking water abstraction/treatment/distribution and sewage collection/wastewater treatment, impoundment and storage of water, infrastructure for flood protection, irrigation water abstraction/treatment and distribution as well as self-abstraction). In the Eastern Alps inclusion of financial costs is stated for all these water services ("partial" for irrigation water abstraction/treatment and distribution), while a calculation was only done for irrigation water abstraction/treatment and distribution. Only for drinking water abstraction/treatment/distribution and sewage collection/wastewater treatment and irrigation water abstraction/treatment and distribution are cost recovery rates provided (of 100 % in both cases). In the Northern Apennines, inclusion of financial costs is done only for drinking water abstraction/treatment/distribution and sewage collection/wastewater treatment, calculation is stated for these services and partial for irrigation water abstraction/treatment and distribution, while cost recovery rates are provided for these two, being in both cases 100 %.

- The RBMP of Sardinia also indicates five water services but different ones (drinking water abstraction/treatment/distribution and sewage collection/wastewater treatment, irrigation water abstraction/treatment and distribution, impoundment and storage of water and infrastructure for flood protection (as an "other" water service), industrial ("other" water service) and self-abstraction). Inclusion of financial costs is indicated for drinking water abstraction/treatment/distribution and sewage collection/wastewater treatment, irrigation water abstraction/treatment and distribution, impoundment and storage of water and infrastructure for flood protection and partially for self-abstraction, while calculation is stated for drinking water abstraction/treatment/distribution and sewage collection/wastewater treatment and partial for irrigation water

abstraction/treatment and distribution, impoundment and storage of water and infrastructure for flood protection (all 100 %).

- The RBMP of Sicily identifies three water services: drinking water, irrigation and industrial services. There is no clear link between the water services and pressures and impacts.

Overall, only in some RBDs is self-abstraction included as water service. In most cases, a very narrow or narrow definition of water services is used.[136] Only for some water services, an overall cost recovery rate is given (always 100 %).

The recovery of costs is carried out for uses and services having a significant impact on water resources taken into consideration in the economic analysis. Full cost recovery is ensured by the existence of national and sectoral regulations that foresee that water pricing is calculated on the basis of the cost recovery principle. Therefore the information on which sectors benefit from a water service (sometimes including additional ones beyond household, industry, agriculture) as well as if users contribute to cost recovery differs from RBD to RBD.

A methodology for the calculation of environmental and resource costs is given at national level, in Ministerial Decree 39/2015 (and the guidelines attached to the decree). Several RBMPs refer to this methodology and indicate the calculation, significance and partial internalisation on the basis of the analysis of pressures and impacts and taking into account the affordability for water services relevant in the River Basin District.

Information about incentive pricing is not included in the RBMPs[137].

In summary, there has been partial progress on the recommendation. The Ministerial Decree 39/2015 has delivered some progress, but needs to be implemented on the regional level. Due to the fractured approaches it is difficult to draw an overall, national-level conclusion. The recommendation has been partially fulfilled.

[136] Italy subsequently clarified that, in accordance with Ministerial Decree 39/2015, in the RBMPs each RBD has identified water services and uses relevant for its territory on the basis of the pressure impact analysis carried out in accordance with the WFD. Self-abstraction is taken into consideration if relevant.

[137] Italy subsequently clarified that the requirements for incentive pricing are laid down by national provisions which require financial tools to be applied to the different services and uses to incentivise the efficient use of water resources.

- *Recommendation (from 2015): Establish in the second RBMPs cycle an appropriate water pricing policy (Article 9 WFD), in particular for agriculture, that provides adequate incentives for users to use water efficiently. Both water provision and self-abstraction should be covered. It should be demonstrated that the policy provides an adequate incentive for users to use water efficiently. Cost-recovery instruments should include all financial, environmental and resource costs.*

  Assessment: Regarding financial, environmental and resource costs, see recommendation above.

  Volumetric pricing is partially applied in Italy. However, the situation may vary from region to region.

  The obligation to measure volumes withdrawn and returned in Italy is provided by art. 95 of Legislative Decree 152/06. More recently in July 2015, the Ministry of Agriculture released "National guidelines to the Regions on the methodologies for the volume quantification of water used for irrigation" which have been implemented at regional level through regional regulations.

  The overall pricing policy regarding water use is also set at the national level (through Ministerial Decree 39/15), but from the RBMPs it is unclear how it is implemented at regional level. Consequently, based on the RBMPs it is not possible to assess whether Italy has implemented this recommendation.

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 RBMP

Protected areas have been identified for all relevant Directives, i.e. Drinking Water, Bathing Water, Birds, Habitats, Urban Waste Water, Nitrate and Shellfish (Table 15.1).

Table 15.1 Number of protected areas of all types in each RBD of Italy, for surface and groundwater

Protected Area type	Number of protected area Associated with				
	Rivers	Lakes	Transitional	Coastal	Groundwater
Abstraction of water intended for human consumption under Article 7	1 641	99		3	12 249
Recreational waters, including areas designated as bathing waters under Directive 76/160/EEC (Bathing water Directive)[138]	99	316	4	2 280	
Protection of species where the maintenance or improvement of the statusof water is an important factor in their protection, including relevant Natura 2000 sites designated under Directive 79/409/EEC (Birds[139])	352	75	45	85	125
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[140])	979	139	70	321	587
Nutrient-sensitive areas, including areas designated as vulnerable zones under Directive 91/676/EEC (Nitrates Directive[141])	796	113	7	76	2 221

[138] 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

[139] 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

[140] 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

[141] 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

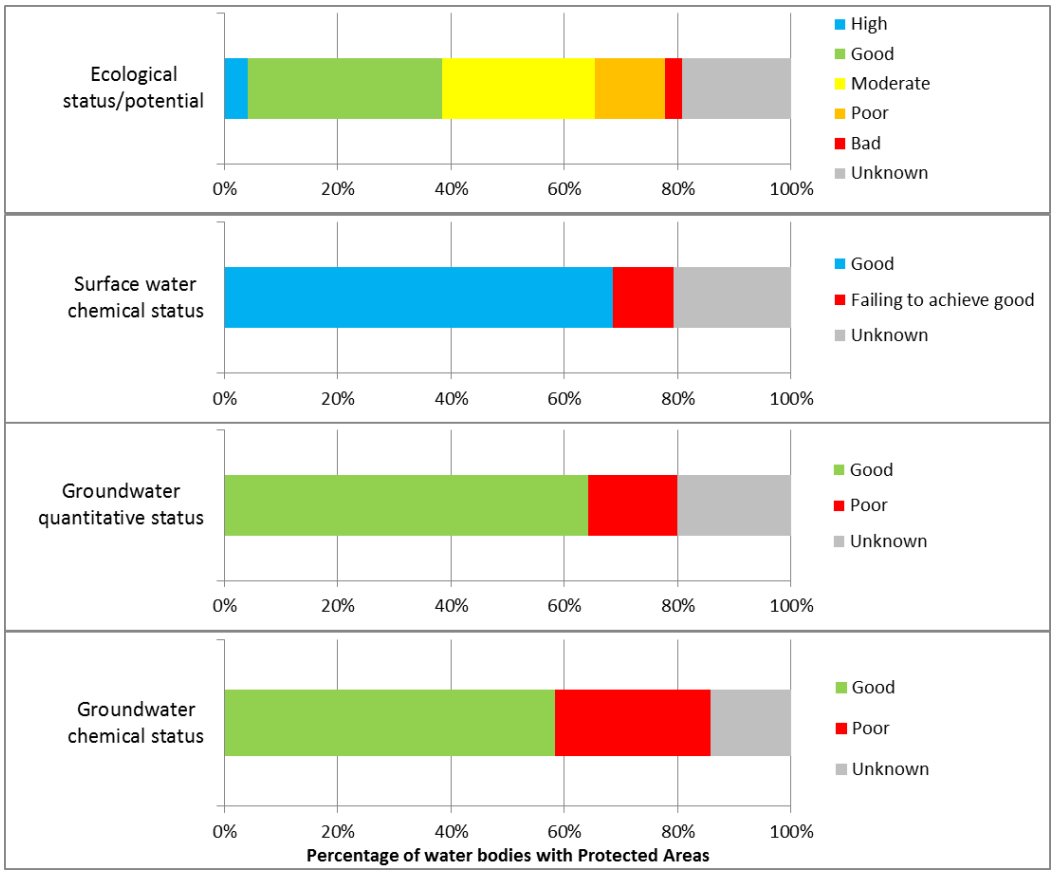
Protected Area type	Number of protected area Associated with				
	Rivers	Lakes	Transitional	Coastal	Groundwater
Areas designated as sensitive areas under Directive 91/271/EEC (Urban Wastewater Treatment Directive[142])	52	95	55	10	
Areas designated for the protection of economically significant aquatic species	545	53	21	89	
Other	342	96	82	119	343

Source: Member States reporting to WISE

The status assessment of Protected Areas was reported to have been carried out with high or medium confidence for around half of the status assessments, but for 14 % of the Protected Areas no information relating to the status of water bodies associated with Protected Areas is available. The assessments made with high or medium confidence should be based on monitoring data, but these figures are not consistent with the very low monitoring activity related to water bodies associated with Protected Areas. The results of the status assessment are shown in Figure 15.1.

[142] 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 Italy. Note: based on status/potential aggregated for all water bodies associated with all Protected Areas



Source: WISE electronic reporting

Protected areas have been considered separately in setting objectives (for example, generic objectives have not simply been applied in relation to the birds and habitats Directives) as demonstrated by a range of options being used to describe the objectives in place (such as needs not known, objectives set, good ecological status is sufficient, specific objectives have been set to protect all habitats and species). For the majority of nature Protected Areas (Habitat and Birds) objectives have not been set, either because additional needs are not known, or because objectives have been set but work is still on-going to determine additional needs – in both cases meaning that additional measures cannot be identified.[143]

[143] Italy subsequently clarified that the Ministry of the Environment has recently published (in April 2018) a guideline that set homogeneous criteria for the identification of the additional objectives (additional needs) in protected areas, depending on the ecological needs of the species and habitats present. Link at: http://www.minambiente.it/sites/default/files/archivio/allegati/trasparenza_valutazione_merito/Pianificazione_governo_territorio/linee_guida.pdf.

However, in the Programmes of Measures of some RBMPs (e.g. Eastern Alps and Po) additional measures have been planned for specific studies aimed at increasing knowledge on the conservation status of species and habitats of community interest related to aquatic environments, interaction between water bodies and Natura 2000 areas and identification of the additional objectives for Protected Areas.

For Article 7 areas (Drinking Water abstraction in both surface and groundwaters), objectives have only been set for a small number of the RBDs (objectives only set for 6 % of surface water Protected Areas in three RBDs and for groundwaters in only one RBD). Objectives have also been set for groundwater dependent nature areas in a few RBDs (two RBDs have areas related to the Birds Directive and four have area related to the Habitats Directive).

The reported monitoring program for protected areas (on the basis of the WISE reporting and only for the water bodies where the monitoring purpose is declared,[144]) is very limited (Table 15.2); for surface water areas monitoring is only reported for four RBDs and for groundwater areas only for two RBDs. More than 2000 Protected Areas were reported under the Habitats Directive but the monitoring program comprises only 194 sites. 12 000 Groundwater drinking water Protected Areas were reported, but specific monitoring is only reported for 38 water bodies. Furthermore, no monitoring of groundwater dependent habitat areas or nitrate sensitive groundwater areas was reported.

Table 15.2 Number of monitored water bodies associated with Protected Areas in Italy

Protected Area type	Number of monitored water bodies associated with Protected Areas in				
	Groundwater	**River**	**Lakes**	**Transitional**	**Coastal**
Abstraction of water intended for human consumption under Article 7	38	39 (37)	18 (14)		
Nutrient-sensitive areas, including areas designated as vulnerable zones under Directive 91/676/EEC (Nitrates Directive)	(124)	351 (245)	11 (9)	37	8
Areas designated as sensitive areas under Directive 91/271/EEC (Urban Wastewater Treatment Directive)		72 (66)	6	35	6
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	(17)	79 (78)	10	22	

[144] Italy clarified that in the reporting in WISE the monitoring purpose field may have been misunderstood by the competent authorities and therefore filled out in a non-exhaustive manner. For this reason the number of water bodies specifically monitored towards protected areas is not correctly reported. The corrected numbers are included in brackets in table 15.2.

Protected Area type	Number of monitored water bodies associated with Protected Areas in				
	Groundwater	River	Lakes	Transitional	Coastal
Directive 92/43/EEC (Habitats)					
Recreational waters, including areas designated as bathing waters under Directive 76/160/EEC (Bathing water Directive)					(13)
Areas designated for the protection of economically significant aquatic species		5		14	4

Source: WISE electronic reporting

Safeguard Zones have been established or plans are in place for their implementation in all eight RBDs. The RBMPs do not contain any details with regard to specific measures that are to be implemented in them, apart from measures relating to their expansion and the identification of related hydrogeological criteria.

For other types of Protected Areas, additional measures are planned in some RBDs. For example, in the North Apennines RBD, additional measures include improving wastewater treatment in water bodies that affect bathing waters, restoration of the longitudinal continuity of rivers and definition and application of ecological flows in freshwaters to support fisheries. For Natura 2000 areas, additional measures include interventions for the naturalisation of the river network and the definition and implementation of ecological flow and regulation of water withdrawals. For sensitive areas under the Urban Waste Water Treatment Directive[145], measures include completion and improvement of wastewater treatment. It is not clear if these additional measures will be sufficient to reach the objectives for Protected Areas.

Exemptions for surface waters have been applied for around 30 % of all Protected Areas (and including most types of Protected Areas) - ranging from 10 % for Drinking water Protected Areas to 54 % for Nitrate Sensitive Areas. Exemptions have been applied in four out of eight RBDs and are justified mainly by disproportionate costs or technical feasibility, with a few justified by natural conditions.

Exemptions for groundwater areas are applied in a much more limited way with only 7 % of the Protected Areas having exemptions applied and in only two out of the eight RBDs (the North Apennines RBD with 16 % and Sicily RBD with 73 % of the Protected Areas exempted).

[145] 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

15.2 Main changes in implementation and compliance since the first RBMP

The number of designated Protected Areas has increased significantly from the first RBMP to the second plans for Article 7, Bathing Water, Habitats and Nitrate Vulnerable areas, whereas the numbers of the remaining types of Protected Areas have remained more or less the same.

There has been a dramatic decrease in the monitoring activity specifically targeted towards protected areas from the first RBMP to the second RBMP[146], for example, for Bathing Waters 262 water bodies were reported in seven RBDs in the first RBMP but only 13 water bodies in two RBD's in the second; for Habitats 874 water bodies were reported in seven RBDs in the first RBMP but only 111 water bodies in three RBDs in the second RBMP and finally the numbers of groundwater drinking water bodies fell from 1 645 sites in six RBDs in the first RBMP to 38 water bodies in two RBDs in the second RBMP. Italy subsequently informed the Commission that these values may be related to an error in the information reported to WISE[147].

15.3 Progress with Commission recommendations

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

- Recommendation: *In order to function as a framework document for water management it is important that all additional measures to reach additional objectives for protected areas are included in the Programmes of Measures.*

  Assessment: In some of the RBDs, additional measures have been identified, but it is not possible to evaluate if these measures are sufficient to reach the specific objectives for the particular type of protected area.

  For a considerable number of protected nature areas (particularly for surface waters) objectives have not been set, either because additional needs are not known, or because objectives have been set but work is still on-going to determine additional needs and therefore additional measures cannot be identified.

[146] Italy subsequently clarified that the comparison with the first RBMPs is not possible because of how the criteria differed between the two cycles (monitored WB, protected areas type, consistent monitoring purpose of related sites).

[147] Italy subsequently informed the Commission of an error in the reported information. The totals subsequently provided were: Drinking water: 443; Bathing: 374; Birds: 892; Habitats: 1423; Fish: 600; Nitrates: 903; Shellfish: 127; UWWTD: 471; and Other: 822.

In principle, the recommendation seems to have been fulfilled as additional measures – where known – are included in the RBMPs. What could be questioned is the large number of protected areas where the needs are not known and where measures have not been identified148. Overall this recommendation has been partially fulfilled.

148 Italy subsequently clarified that the Ministry of the Environment has recently published (in April 2018) a guideline that sets homogeneous criteria for the identification of additional objectives (additional needs) in protected areas, depending on the ecological needs of the species and habitats present. (http://www.minambiente.it/sites/default/files/archivio/allegati/trasparenza_valutazione_merito/Pianificazione_governo_territorio/linee_guida.pdf)

Topic 16 Adaptation to drought and climate change

16.1 Assessment of implementation and compliance with WFD requirements in the second RBMP

Climate change was considered in all RBDs. The guidance on how to adapt to climate change (Common Implementation Strategy Guidance Document No. 24[149]) was used in the Padan, North Apennines, Sardinia and Sicily RBDs[150].

Checking the effectiveness of measures in relation to climate change was carried out in the North Apennines, Serchio, South Apennines, and Sicily RBDs. Detecting climate change signals was reported in the Padan, North Apennines, Serchio, South Apennines and Sardinia RBDs. Drought management and water scarcity is addressed in all RBDs except Sicily. Flood risk management was also addressed in all RBDs except Sicily.

Climate change plays a role in forecasting the economics of water supply and demand and in the maximisation of cross-sectoral benefits and minimisation of negative effects across sectors in the Padan, Central Apennines, South Apennines and Sardinia RBDs. Monitoring change at reference sites was reported for the Padan, North Apennines, Central Apennines, South Apennines and Sardinia RBDs. Climate change has been considered in the preferential selection of robust adaptation measures in the Eastern Alps, Padan and Serchio RBDs. Climate change was considered when setting objectives in the South Apennines and Sardinia RBDs.

Specific sub-plans addressing climate change were reported for the Padan and North Apennines RBDs. Adaptation measures (KTM24 - "Adaptation to climate change") are made operational to address significant pressures related to agricultural diffuse pollution in the Eastern Alps and Central Apennines RBDs, as well as abstractions and hydrological alterations in Sardinia RBD.

According to the 2012 Topic Report: Assessment on water scarcity and drought aspects in a selection of European Union RBMPs[151], the relevance of droughts was river-basin wide for the Eastern Alps and Sicily RBDs, whilst it was local or for sub-basins in the Padan, South Apennines and Sardinia RBDs and unclear for the North Apennines, Serchio and Central

[149] https://circabc.europa.eu/sd/a/a88369ef-df4d-43b1-8c8c-306ac7c2d6e1/Guidance%20document%20n%2024%20-%20River%20Basin%20Management%20in%20a%20Changing%20Climate_FINAL.pdf

[150] Italy subsequently clarified that the guidance on how to adapt to climate change was also used in the Eastern Alps RBD.

[151] http://ec.europa.eu/environment/water/quantity/pdf/Assessment%20WSD.pdf

Apennines RBDs. No exemptions have been applied for Italy following Article 4(6) due to prolonged droughts.

Drought Management Plans were reported for Italy for the Eastern Alps, Padan, North Apennines, Serchio, Central Apennines and Sardinia RBDs in 2012[152], and for the second RBMP such plans are developed for the Padan RBD, the North Apennines RBD, the Central Apennines RBD and the Sardinia RBD.

The European Commission made no recommendation regarding drought management on the first RBMPs.

16.2 Main changes in implementation and compliance since the first RBMP

A climate check of the Programmes of Measures was not performed in the first RBMP, but has been done in the second RBMP in the Padan, North Apennines, Sardinia and Sicily RBDs[153]. Drought Management Plans were reported for Italy for the Eastern Alps, Padan, North Apennines, Serchio, Central Apennines and Sardinia RBDs in 2012, and for the second RBMP such plans were developed for the Padan, North Apennines, and Central Apennines RBDs.[154] For the Sardinia RBD drought management is included in the RBMP.

16.3 Progress with Commission recommendations

There were no Commission recommendations based on the first RBMPs and first Programme of Measures.

[152] Topic report on: Assessment of Water Scarcity and Drought aspects in a selection of European Union RBMPs

[153] Italy subsequently clarified that the Eastern Alps RBD was included in the climate check of the Programmes of Measures.

[154] Italy also informed the Commission that improvements after 2016 include the management of water resources in situations of water shortage.