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**Third River Basin Management Plans
Member State: Bulgaria**

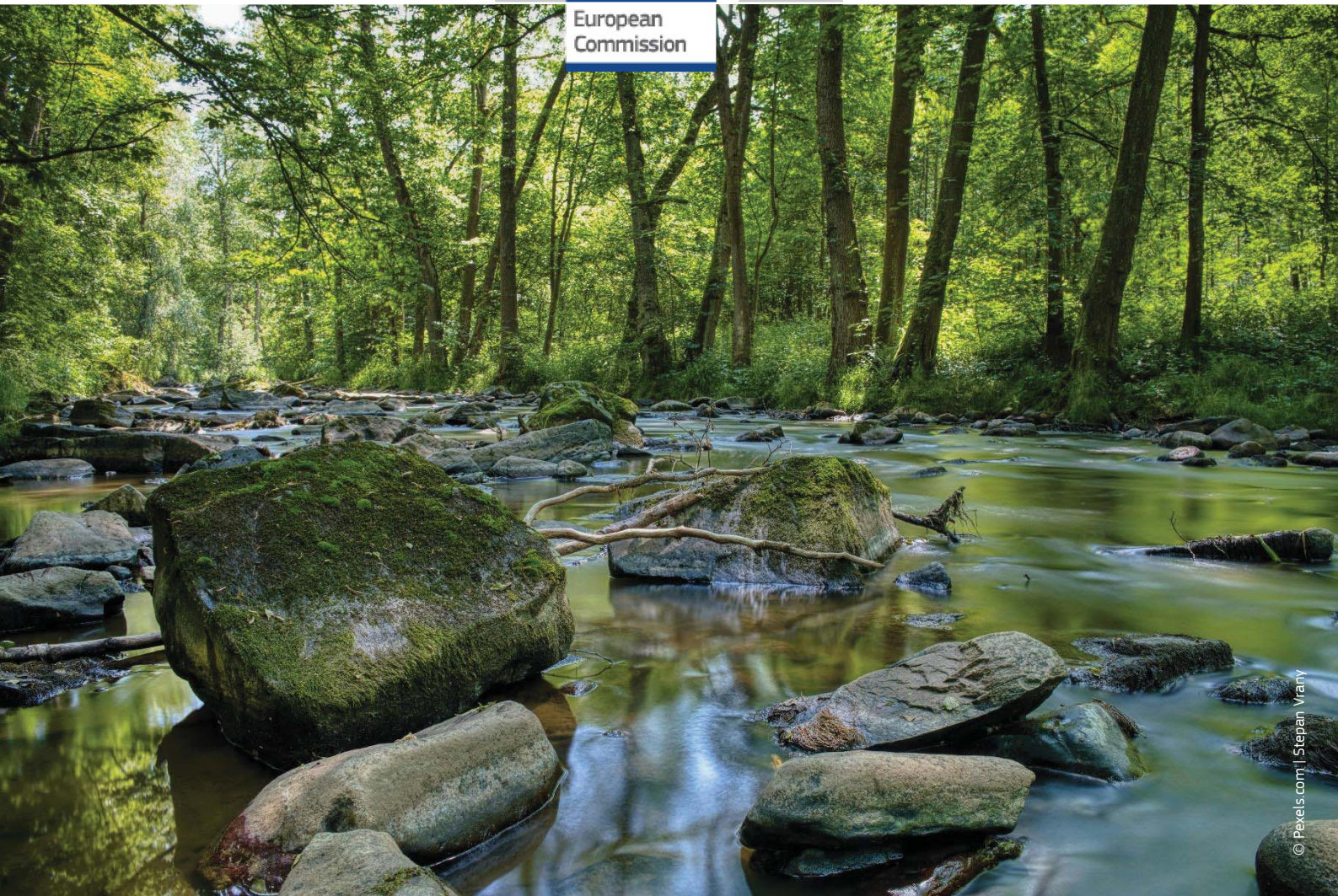
Accompanying the document

**REPORT FROM THE COMMISSION TO THE COUNCIL AND THE EUROPEAN
PARLIAMENT**

**on the implementation of the Water Framework Directive (2000/60/EC) and the Floods
Directive (2007/60/EC)**

**Third River Basin Management Plans
Second Flood Risk Management Plans**

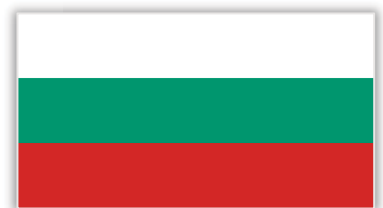
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Country specific staff working document

Bulgaria



Content

Content.....	2
SECTION A: WATER FRAMEWORK DIRECTIVE.....	3
1. General info, member state characterisation.....	4
2. Horizontal aspects.....	8
2.1 Governance.....	8
2.2 Characterization of River Basin District.....	8
3. Policy elements contributing to biodiversity and climate change adaptation.....	12
3.1 Surface Water: what is their ecological status or potential.....	12
3.2 Hydromorphological changes and artificialization (HMWBs and AWBs).....	14
3.3 Groundwater bodies - have they sufficient water – quantitative status.....	15
3.4 Protected Areas (identification, monitoring, objectives and measures).....	16
3.5 What is being done to prevent/reduce hydromorphological pressures.....	17
3.6 What Bulgaria is doing for abstractions and water scarcity.....	18
3.7 Adaptation to climate change.....	19
4. Policy elements contributing to zero pollution.....	20
4.1 Surface Water: what is their chemical status.....	20
4.2 Groundwater Bodies: what is their chemical status.....	21
4.3 What Bulgaria is doing to combat pollution from agriculture.....	22
4.4 What Bulgaria is doing to combat pollution from other sectors.....	23
4.5 What Bulgaria is doing to combat significant pressures – overall assessment of the Programmes of Measures.....	24
5. Exemptions and economics.....	25
5.1 To what extent are exemptions applied in Bulgaria.....	25
5.2 Use of economic analysis and water pricing – cost recovery.....	26
6. WFD recommendations.....	29
SECTION B: FLOODS DIRECTIVE.....	31
7.1 Flood hazard and risk maps	32
7.2 Flood risk management plans.....	33
8. FD recommendations	36

SECTION A:

WATER FRAMEWORK DIRECTIVE

1. General info, Member State characterisation

Bulgaria, a predominantly mountainous country, covers a terrestrial area of over 110 000 km² and has a marine area exceeding 35 000 km². It is characterised by plains, the Balkan and Rhodope mountain ranges, and the Black Sea coastline. The country shares borders with five neighbouring states. Bulgaria's territory stretches from the Danube River and Danubian plain in the north to the Balkan mountain range in the centre, and the Rhodope Mountains and Upper Thracian Plain in the south. The northern part of the country is mainly lowlands, while the central and southernmost part are mountainous. The highest part is the Rila Mountains.

Bulgaria has identified four river basin districts (RBDs), all of which are international. The country is home to one of the greatest biological diversities in Europe; 26% of the species identified in Europe and over 2% of those worldwide are found in Bulgaria. This rich biodiversity is conserved in three national parks. Bulgaria has some of the largest Natura 2000 areas in Europe, covering 33.8% of its territory.

Conversely, Bulgaria is a country based on heavy industry. Major industrial activities include extraction of metals and minerals, production of chemicals, machine building and steel and petroleum refining. Air quality in Bulgaria continues to face challenges, particularly in the area surrounding the lignite-fired power station Maritsa Izток-2. Around 41% of Bulgaria's land is used for agriculture, and the agricultural sector plays an important role for the economy. The agricultural sector generates around 4% of the country's Gross Value Added and more than 6% of total employment. The vast majority of farm holdings are very small (below five hectares) and a very small area of agricultural land is under organic farming (2.2%).



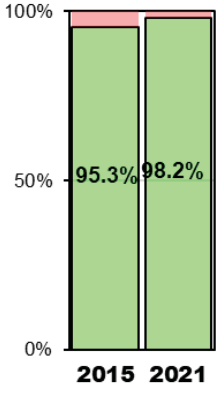
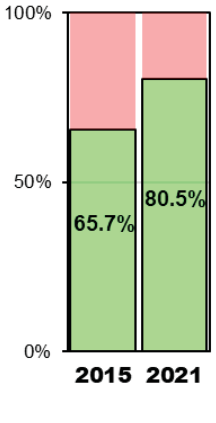
Reporting

The deadline for reporting the third river basin management plans (RBMPs) was in March 2022. The Commission and the European Environment Agency (EEA), together with Member States developed a voluntary electronic reporting system called WISE (Water Information System for Europe). Some Member States used it to fulfil their obligations; others submitted their plans in pdf format. The cut-off date for WISE e-reporting was September 2023, and the Member States were assessed based on the datasets available by this date.

No submission was made through WISE e-reporting in time to be taken into account in the assessment. All four national RBDs were used to analyse the RBMPs in pdf format in depth. Some gap filling of quantitative data was undertaken using data from the RBMPs and supporting documents to enable this assessment report to include quantitative information, charts and figures and to provide a more comprehensive view of compliance in the Member State. This information is labelled as 'data mining'.

Changes in status, pressures, exemptions and measures

Surface water bodies	Trend (% good status/potential)	Main pressures & changes & exemptions						
The total number of surface water bodies (SWBs) has remained the same since the second RBMPs (955).								
ECOLOGICAL STATUS	<table><tr><th>Year</th><th>% good status/potential</th></tr><tr><td>2015</td><td>47.0%</td></tr><tr><td>2021</td><td>37.0%</td></tr></table>	Year	% good status/potential	2015	47.0%	2021	37.0%	Only 37% of total SWBs had good or high ecological status/potential in 2021, a significant decrease from 47% in 2015. This is partly due to better understanding of status/potential, including better monitoring and updated methodologies to assess status/potential. The share of SWBs with unknown ecological status/potential decreased from 9% to 1%. No improvement in ecological status/potential is expected by 2027. Monitoring networks have been expanded, with new monitoring sites added between the second and third RBMPs. In total, the third RBMPs report that there are 657 monitoring sites for surveillance monitoring and 771 sites for operational monitoring. The most significant pressures on SWBs are point sources (affecting 31% of SWBs), diffuse sources (affecting 30% of SWBs) and hydromorphological alterations (affecting 15% of SWBs). Organic pollution and nitrogen pollution are the most significant impacts, affecting 32% and 31% of SWBs respectively. Article 4(4) has been applied to exempt 271 SWBs (28.4%) with less than good ecological status on the grounds of technical feasibility, and to exempt 301 SWBs (31.5%) on the grounds of natural conditions. Article 4(5) has been applied to exempt 18 SWBs (1.9%) on the grounds of infeasibility. Article 4(7) has been applied to two SWBs (0.2%).
Year	% good status/potential							
2015	47.0%							
2021	37.0%							
CHEMICAL STATUS	<table><tr><th>Year</th><th>% good status/potential</th></tr><tr><td>2015</td><td>33.7%</td></tr><tr><td>2021</td><td>66.5%</td></tr></table>	Year	% good status/potential	2015	33.7%	2021	66.5%	The national surface water monitoring network that supports chemical status assessments has been reviewed and expanded as part of the preparation of the third RBMPs. The existing monitoring programmes from the second RBMPs have been updated and now cover 49% of all rivers, 94% of all lakes and 100% of all coastal and transitional waters. All 45 priority substances and two matrices (biota, sediment) are included in the monitoring. 66.5% of total SWBs had good chemical status in 2021, a significant increase from 33.7% in 2015. No further improvement in chemical status is expected by 2027. Article 4(4) has been applied to exempt 107 SWBs (11.2%) with less than good chemical status on the grounds of technical feasibility, and to exempt 67 SWBs (7.0%) on the grounds of natural conditions. Article 4(5) has been applied to exempt 14 SWBs (1.5%) on the grounds of infeasibility.
Year	% good status/potential							
2015	33.7%							
2021	66.5%							
Groundwater bodies	Trend (% good status/potential)	Main pressures & changes & exemptions						
The number of GWBs has remained the same since the second RBMPs (169).								

QUANTITATIVE STATUS	 <table border="1"> <thead> <tr> <th>Year</th> <th>Good Quantitative Status (%)</th> <th>Poor Quantitative Status (%)</th> </tr> </thead> <tbody> <tr> <td>2015</td> <td>95.3%</td> <td>4.7%</td> </tr> <tr> <td>2021</td> <td>98.2%</td> <td>1.8%</td> </tr> </tbody> </table>	Year	Good Quantitative Status (%)	Poor Quantitative Status (%)	2015	95.3%	4.7%	2021	98.2%	1.8%	79.3% of total GWBs are monitored with quantitative monitoring. 98.2% of total GWBs had good quantitative status in 2021, a slight increase from 95.3% in 2015. No further improvement in quantitative status is expected by 2027. Article 4(4) has been applied to exempt three GWBs (1.8%) with poor quantitative status on the grounds of technical feasibility.
Year	Good Quantitative Status (%)	Poor Quantitative Status (%)									
2015	95.3%	4.7%									
2021	98.2%	1.8%									
CHEMICAL STATUS	 <table border="1"> <thead> <tr> <th>Year</th> <th>Good Chemical Status (%)</th> <th>Less than Good Chemical Status (%)</th> </tr> </thead> <tbody> <tr> <td>2015</td> <td>65.7%</td> <td>34.3%</td> </tr> <tr> <td>2021</td> <td>80.5%</td> <td>19.5%</td> </tr> </tbody> </table>	Year	Good Chemical Status (%)	Less than Good Chemical Status (%)	2015	65.7%	34.3%	2021	80.5%	19.5%	99.4% of total GWBs are monitored with chemical (surveillance and/or operational) monitoring. The most significant pressures on GWBs are diffuse sources (affecting 41% of GWBs), point sources (affecting 28% of GWBs) and historical pollution (affecting 4% of GWBs). Nitrogen pollution and chemical pollution are the most significant impacts, affecting 16% and 9% of of SWBs respectively. 80.5% of total GWBs had good chemical status in 2021, a significant increase from 65.7% in 2015. No further improvement in chemical status is expected by 2027. Article 4(4) has been applied to exempt 18 GWBs (10.7%) with less than good chemical status on the ground sof technical feasibility, and to exempt 11 GWBs (6.5%) on the grounds of natural conditions. Article 4(5) has been applied to exempt four GWBs (2.4%) on the grounds of infeasibility.
Year	Good Chemical Status (%)	Less than Good Chemical Status (%)									
2015	65.7%	34.3%									
2021	80.5%	19.5%									

2. Horizontal aspects



2.1 Governance

Bulgaria has a complex multi-layer water governance. At the top is the Water Coordination Council led by the Ministry of Environment and Waters, with the participation of other relevant ministries. Several national agencies and the National Institute of Meteorology and Hydrology support water monitoring. The state company 'Irrigation systems' (under the Ministry of Agriculture and Food) is responsible for irrigation water supply, while the Energy and Water Regulatory Commission is a national regulatory body exercising regulatory functions over water supply and sanitation services.

The River Basin Directorates are in charge of preparing and implementing the RBMPs of their river basin district, and municipalities help implement measures at local level. The Energy and Water Regulatory Commission (EWRC) monitors the activities of water supply and sewerage operators and approves their business plan service prices.

All four national RBDs are part of international RBDs. This includes the Danube, Struma, Mesta, Maritsa, Veleka and Rezovska rivers, as well as the Black Sea. For the Danube RBD, Bulgaria is member of the International Commission for the Protection of the Danube River (ICPDR). For the Black Sea RBD, Bulgaria is a member of the International Commission for the Protection of the Black Sea from Pollution. For the other international RBDs, bilateral agreements with the neighbouring countries are in place. International cooperation with Serbia and North Macedonia needs to be further improved.

All third RBMPs take into account the objectives and measures of the Floods Directive (FD). The third RBMP of the Black Sea RBD also provides for synergies with the objectives of the Marine Strategy Framework Directive (MSFD).

The public consultation for Bulgaria's third RBMPs was conducted over six months, including four national thematic meetings (for example, on urban wastewater, agriculture, and energy) and 17 regional consultations.

Bulgaria has not adopted third RBMPs according to the WFD timetable.



2.2 Characterisation of river basin districts

Table 1. Overview of Bulgaria's RBDs

RBD	Name	Size (km ²)	Coastal water area (km ²)	Countries sharing RBD
BG1000	Danube	47 235	0	RS, RO
BG2000	Black Sea	18 043	6 358	RO, TR
BG3000	East Aegean	35 236	0	EL, TR
BG4000	West Aegean	11 947	0	EL, RS, MK

Source: third RBMPs pdf documents

Table 2. Number of water bodies

RBD	Rivers	Lakes	Coastal waters	Transitional waters	Groundwaters
BG1000	249	7	0	0	50
BG2000	143	17	17	28	40
BG3000	261	50	0	0	41
BG4000	168	15	0	0	38
Total	821	89	17	28	169

Source: third RBMPs pdf documents

In Bulgaria, agricultural pressures – particularly diffuse pollution from nutrients (nitrates, phosphates) and pesticides – remain significant, especially in the Danube and East Aegean RBDs, with no clear downward trend despite measures under the Nitrates Directive. Climate change (droughts, floods) is worsening diffuse pollution risks, particularly in agriculture. Hydropower expansion is not planned, but existing infrastructure (for example, along the Danube and Maritsa rivers) continues to exert hydromorphological pressures, with no major new projects highlighted in the third RBMPs. The key hydromorphological pressures identified in the third RBMPs are disrupted river continuity, engineering works or interventions that change the shape of water bodies, altered flow regimes, degraded riverbeds/floodplains, connectivity or sediment dynamics. The alterations are mainly related to hydropower, irrigation and flood protection.

Urban wastewater and industrial discharges remain the dominant point-source pressures. Municipal wastewater remains the dominant pressure across most RBDs, particularly in relation to point-source organic and nutrient pollution.

Bulgaria provides a detailed assessment of significant pressures per water body in the third RBMPs, which is widely based on national methodologies, covering both quantitative and qualitative pressures. There are national methodologies in place to assess pollution, abstraction and hydromorphological pressures from agriculture, but some gaps remain. Three out of four third RBMPs (Danube, Black Sea and West Aegean RBMPs) provide an overview of the remaining gaps and challenges in relation to pressure/impact analysis.

The key gaps are associated with insufficient monitoring data or data of insufficient quality (credibility, coverage, format). In such cases, it is difficult or impossible to carry out certain pressure assessments in full (such as diffuse pollution from agriculture, including relevant spatial data, pollution from industrial sites no longer active and invasive alien species). Furthermore, there is a lack of models to assess the combined impacts of different pressures, including their cumulative impacts. The conclusion notes that there is a need to review the statistical and methodological instruments that support analysis of the significance of pressures and impacts.

Surface waters

In the third RBMPs, the most significant pressures were reported to be point sources (31%), followed by diffuse sources (30%) and hydromorphology (29%) (Figure 1). There seems to be a shift in pressures between the second and third cycles. Indeed, the impact of point sources, abstraction and unknown anthropogenic pressure on SWBs have decreased, whereas atmospheric deposition and hydromorphology pressures have increased.

The most significant impacts were reported to be organic pollution (32%), followed by nitrogen pollution (31%), altered habitats due to morphological changes (19%) and chemical pollution (17%) (Figure 2). Since the second RBMPs, nitrogen pollution has decreased significantly, whereas organic pollution, chemical pollution and altered habitats due to morphological changes have increased in significance.

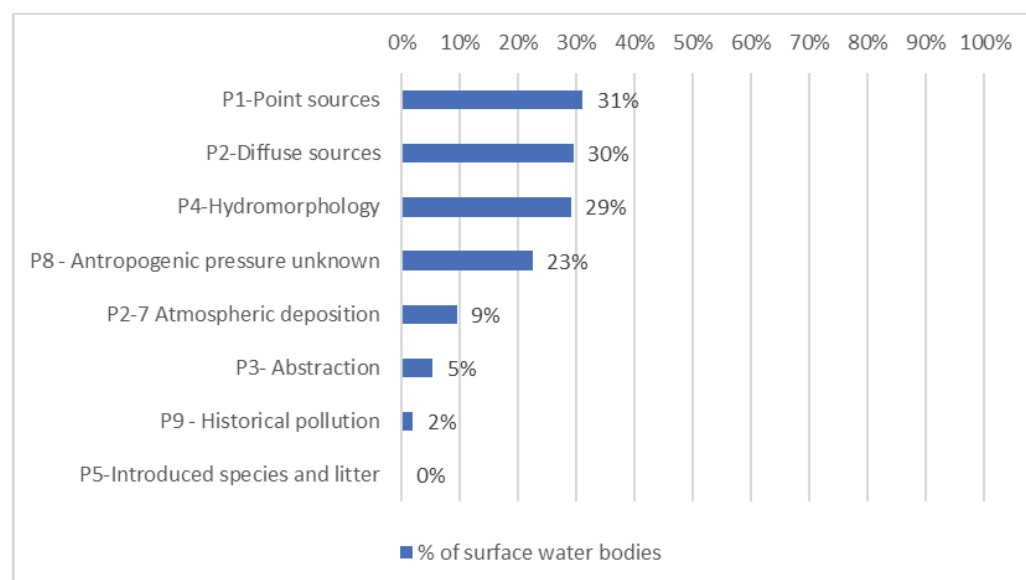
Groundwaters

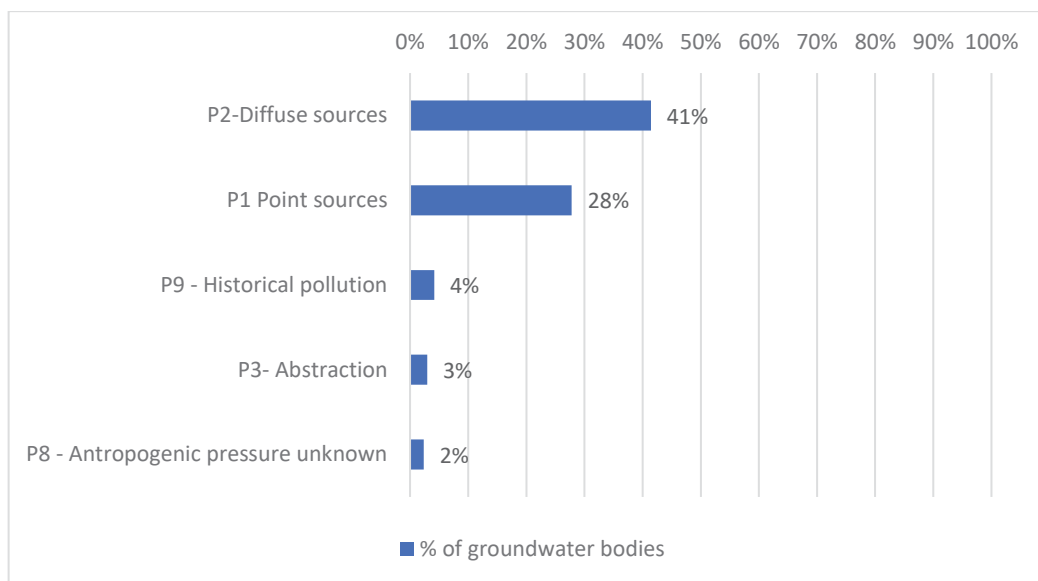
Bulgaria delineated 169 GWBs, three of them transboundary, with no changes in boundaries or total area between cycles.

In the third RBMPs, the most significant pressures on GWBs were reported to be diffuse sources (41%), followed by point sources (28%) and historical pollution (4%) (Figure 1). It is noted that since the second RBMPs, all types of pressures on GWBs are reported to have decreased in significance. This is most likely an impact of better monitoring and methodological refinements – such as a better distinction between natural and anthropogenic pollution – leading to more accurate classifications, reducing the perceived significance of some pressures.

The most significant impacts are nitrogen pollution (16%), followed by chemical pollution (9%), organic pollution (5%) (Figure 2). Since the second RBMPs, nitrogen pollution in GWBs, as well as chemical pollution (except for the Danube RBD), are reported to have decreased in significance, whereas organic pollution is reported to have increased. The decline in nitrogen and chemical pollution reflects improved wastewater treatment and reduced industrial discharges, while the rise in organic pollution stems from increased urban and agricultural runoff (such as manure and sewage leaks) and insufficient treatment of small-scale or rural wastewater sources.

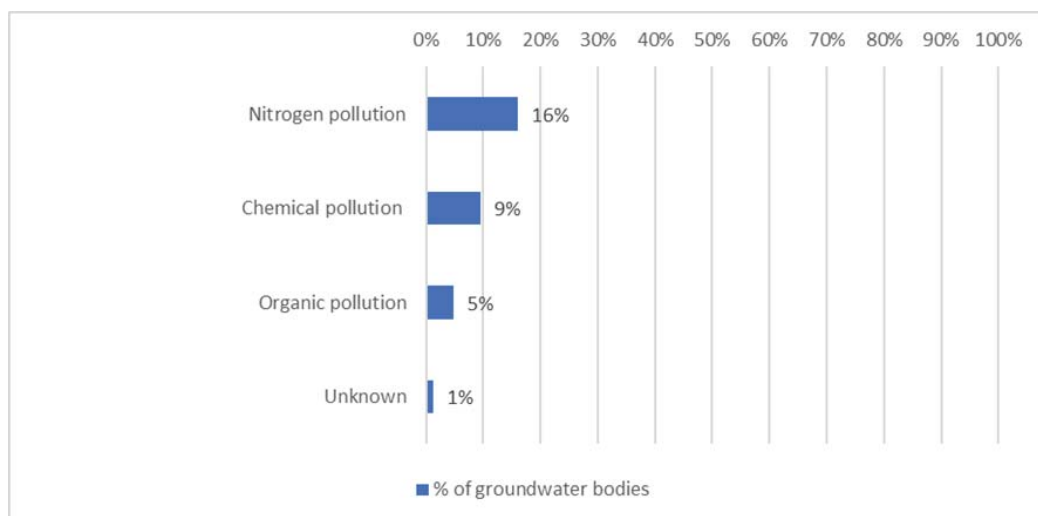
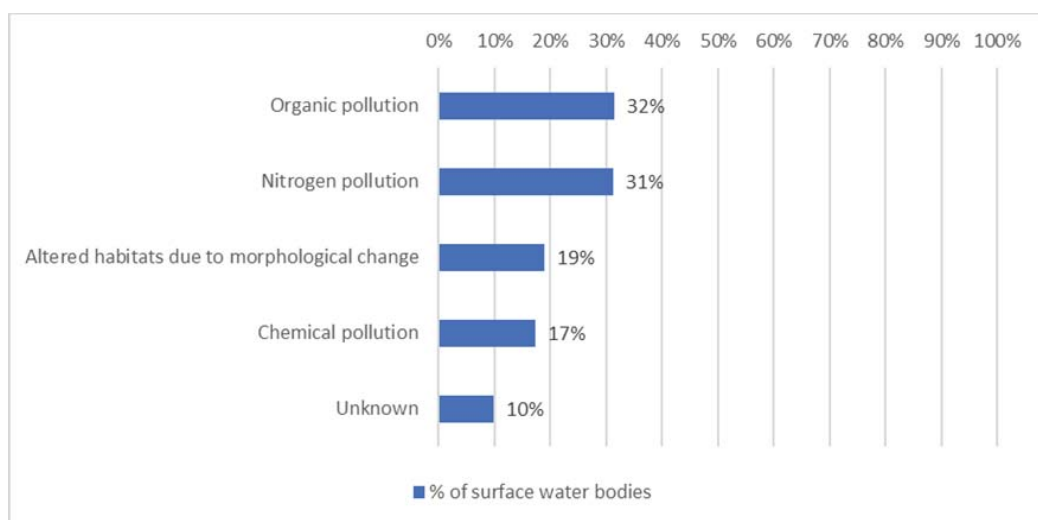
Figure 1. The most significant pressures on surface water and GWBs in Bulgaria in the third RBMP (expressed as percentages of numbers of water bodies)





Source: third RBMPs pdf documents

Figure 2. The most significant impacts on surface water and GWBs in Bulgaria in the third RBMPs (expressed as percentages of numbers of water bodies)



Source: third RBMPs pdf documents

Water scarcity

Due to climate change, water scarcity conditions are expected to become more frequent in the country. All the third RBMPs present forecasts for areas with a significant risk of water scarcity and droughts in the 2071-2100 period, using the most pessimistic climate change scenario (RCP8.5). Furthermore, the international RBMP of the Danube lists three Bulgarian districts where shortages of drinking and domestic water supply have been identified.

Water abstraction

As water abstraction is not identified as a significant pressure at RBD level or in significant portions of an RBD, the country is not required under the WFD to report data on the Water Exploitation Index+ (WEI+) at national or RBD level. However, Bulgaria has included WEI+ data in the third RBMPs, taking stock of data published by the EEA. The current estimation of the annual WEI+ at country level is 0.93% - 1.13% for the period 2016-2021¹, with seasonal WEI+ reaching 2.0% in the third quarter of 2019. In general, the third RBMPs do not address water abstraction/scarcity as a significant issue at national level, similarly to the second RBMPs.

Main water uses

Bulgaria has reported to WISE SoE reporting on Water Quantity relevant data on water abstraction for the period concerning the third RBMPs (2016-2021). The data cover all water sources (e.g. groundwater, surface water), all water sectors (including different subsectors of the manufacturing sector), public water supply and self-abstraction. Self-abstraction accounts for roughly 70% and public water supply 30% of the water abstracted in total. The third RBMP includes certain references to the methods of estimating consumptive uses, such as direct measurement, metering and permit data.

Based on available statistics², the major users in Bulgaria are: electricity generation, including cooling water (79.0%); agriculture (7.2%)³; processing industry and other industrial activities (5.9%); households and services (1.6 %); mining and quarrying (0.6 %); and construction (< 0.1%). Since 2016, total water abstraction has decreased, due to decreases in all water uses, except for mining, other industrial activities and services, where water abstraction is increasing.

3. Policy elements contributing to biodiversity and climate change adaptation



3.1 Surface waters: what is their ecological status or potential

Monitoring

There are two main types of monitoring: i) operational monitoring to determine the status of all water bodies at risk of not reaching the environmental objectives; and ii) surveillance monitoring aimed rather at providing an assessment of the overall surface water status within the river basin district, as well as identifying impacts and long-term changes.

¹ https://ec.europa.eu/eurostat/databrowser/view/sdg_06_60/default/table?lang=en.

² https://infostat.nsi.bg/infostat/pages/reports/result.jsf?x_2=1766.

³ According to the methodology of the National Statistical Institute, this includes irrigation systems that sell water for agricultural use, as well as self-abstracting users abstracting more than 20 000 m³/year.

In Bulgaria, there are 592 surveillance monitoring sites and 729 operational monitoring sites in rivers, lakes and transitional waters, and 65 surveillance monitoring sites and 42 operational monitoring sites in coastal waters.

It is noted positively that monitoring of water bodies has improved considerably, and the monitoring schemes are very comprehensive.

Monitoring networks have been expanded to include new monitoring sites between the cycles. It is of particular note that the number of monitoring sites in lakes increased significantly from 40 to 138 as a result of certain monitored water bodies previously delineated as rivers in the second RBMPs being delineated as lakes in the third RBMPs.

It is noted positively that monitoring covers all the different quality elements required by law as regards the monitoring of the biological quality element, but regrettably macroalgae and angiosperms in transitional waters are not covered. However, this is because transitional waters in the Black Sea RBD are located in estuaries and in coastal lakes where it is more relevant to monitor phytobenthos than macroalgae and angiosperms. As for hydromorphological quality elements, all required elements are monitored, except possibly in transitional waters, for which this is unclear. For general physico-chemical quality elements, all required quality elements are monitored. For each quality element, the monitoring frequency is indicated in the RBMP. It is noted positively that river basin-specific pollutants (RBSPs) are monitored in all water categories relevant to each RBD. The monitoring frequency depends on the pollutant and ranges from once per month to four times per year.

Status assessment

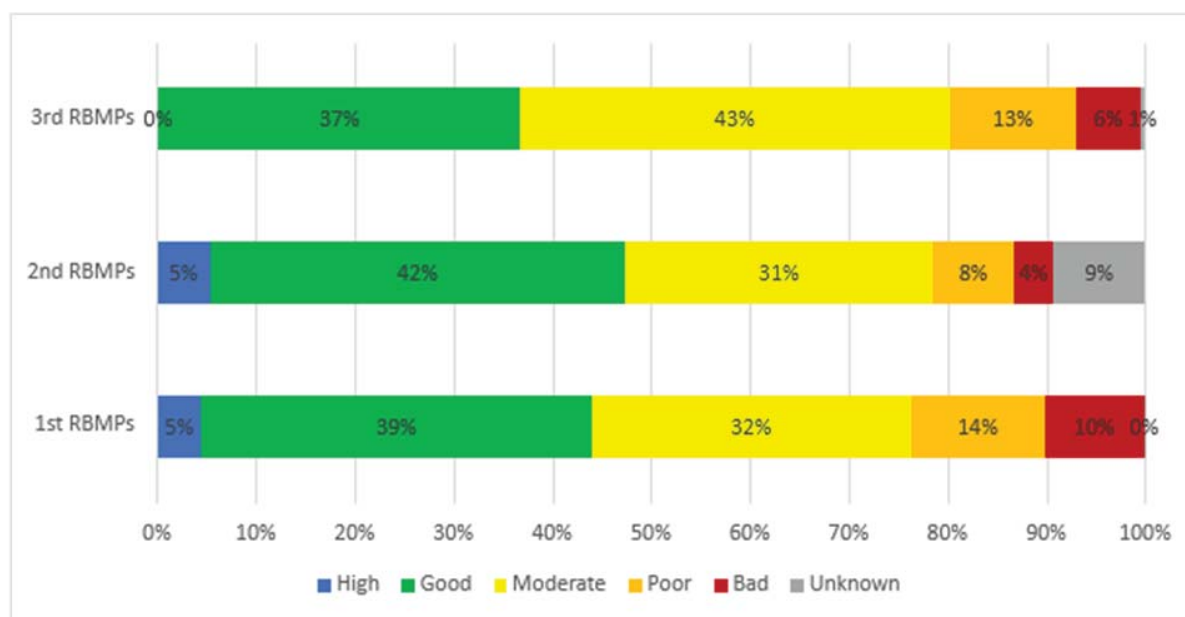
The third RBMPs indicate that the reference conditions were established for all surface water types in the first RBMPs and updated again where necessary in the third RBMPs. The biological reference conditions are given as reference values for each biological quality element (BQE), which are used to prepare the ecological status classification system.

The assessment is supported by biological quality elements (as main criteria), physico-chemical, hydromorphological quality elements, and river basin-specific pollutants. The share of water bodies with poor or bad status has also increased from 12% to 19%. On the other hand, there is a decrease in the share of water bodies with unknown status, from 9% to 1%. No further improvement is expected by 2027.

It is noted that the level of confidence on some assessments has improved compared to the second cycle, while for others it has decreased. So it is difficult to establish a trend. This uneven situation shows striking differences between different RBDs. While the majority of the assessments conducted in the Danube RBD indicate high confidence (88%), in the West Aegean RBD only 10% of the assessments indicate high confidence. In the Black Sea and the East Aegean RBDs, most of the assessments were conducted with moderate confidence.

Figure 3 appears to show that the status has deteriorated compared to the previous cycle, which seems at odds with findings that pressures and impacts have been reduced.

Figure 3 Ecological status or potential of SWBs in Bulgaria in the first, second and third RBMPs



Source: third RBMPs pdf documents

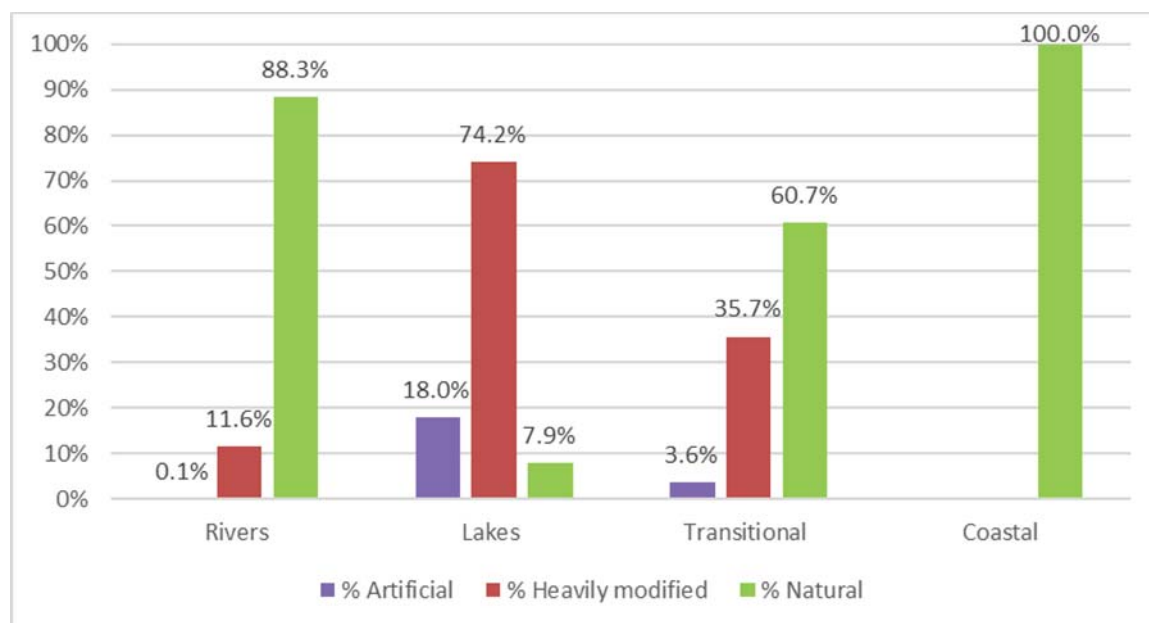


3.2 Hydromorphological changes and artificialisation – heavily-modified water bodies and artificial water bodies (HMWBs and AWBs)

Hydromorphological characteristics of SWBs concern the hydrological conditions (such as quantity and dynamics of water flow, connection of rivers and lakes to GWBs, wave exposure of transitional and coastal water bodies), the morphological conditions (e.g. depth and width variation, structure and substrate of the bed, structure of the riparian zone), and for river water bodies, river connectivity. Some SWBs are such that the changes in the water bodies' hydromorphological characteristics that would be necessary to achieve good ecological status (GES) would have significant adverse effects on the wider environment or on any of various uses, including navigation, flood protection, hydropower and irrigation. Member States can, in such cases, designate these water bodies as heavily-modified water bodies (HMWB) or Artificial Water Bodies (AWB), which have an environmental objective of Good Ecological Potential (GEP) instead of GES.

Figure 4 shows the level of human intervention for each category of SWB. Compared to other Member States, the level of human intervention is not high, except for lakes, where the vast majority are artificial or heavily modified.

Figure 4. The proportion of natural, heavily-modified, and artificial water bodies by water category and total



Source: third RBMPs pdf documents

It is noted that the RBMPs still mention some gaps and limitations to be addressed in future actions, and it is still being considered whether the methodology for designating these water bodies is valid for coastal waters.

The approach to define GEP makes a direct reference to GES. While this methodology is fully operational, all third RBMPs (except in the East Aegean RBD) mention that further improvements could be possible in terms of the classification of ecological potential. All HMWBs have a GEP assigned as their environmental objective.



3.3 Groundwater bodies - have they sufficient water – quantitative status

Monitoring

Quantitative monitoring increased from 120 GWBs (71%) to 134 GWBs (79.3%) in the third RBMPs. Equally, monitoring sites increased from 323 to 513. 157 GWBs have been identified as drinking water protected areas (156 GWBs in the second RBMPs).

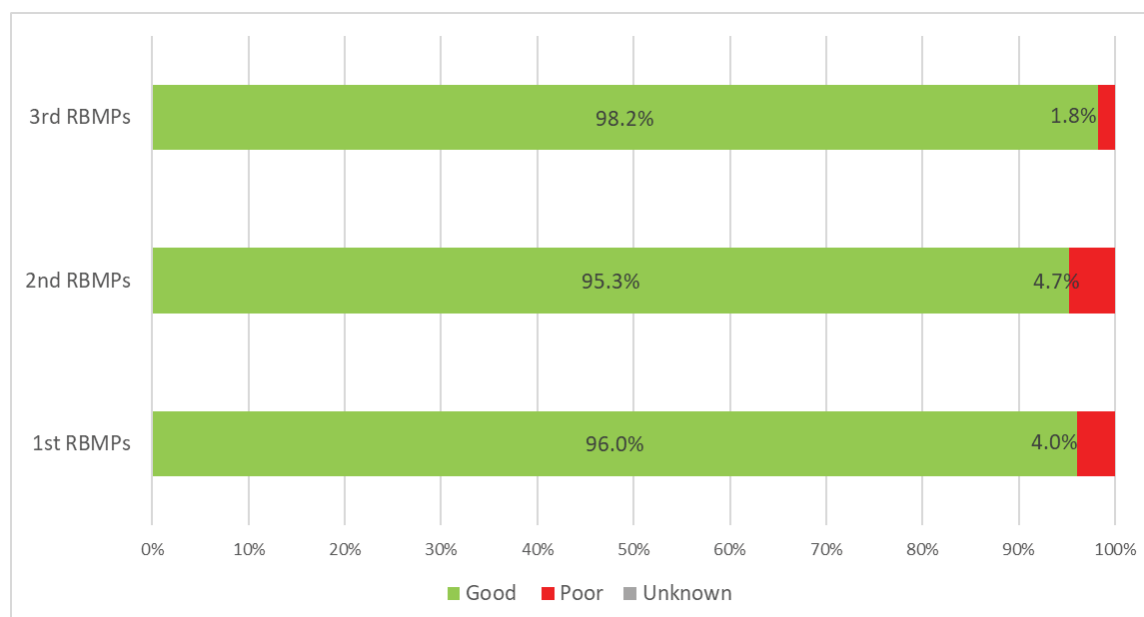
Status assessment

Figure 5 provides an overview of the status assessment in comparison with the second RBMPs. According to the data reported, there seems to be an improvement in the chemical status of GWBs compared to the previous cycle. This may seem at odds with the increase in some pressures. The improvement is largely procedural – driven by better monitoring, revised thresholds, and reclassified pressures – rather than actual reductions in pollution loads.

All three GWBs already having poor quantitative status by 2021, located in the West Aegean RBD, are also expected to be in poor quantitative status by 2027, since they are subject to very significant overexploitation, with water abstraction exceeding 40% of the available water resources.

Moreover, it is noted with significant concern that 18 GWBs (11% of total GWBs) have been assessed to be at risk of not achieving good quantitative status by 2027.

Figure 5 Quantitative status of GWBs in Bulgaria in the first, second and third RBMPs



Source: third RBMPs pdf documents



3.4 Protected areas (identification, monitoring, objectives and measures)

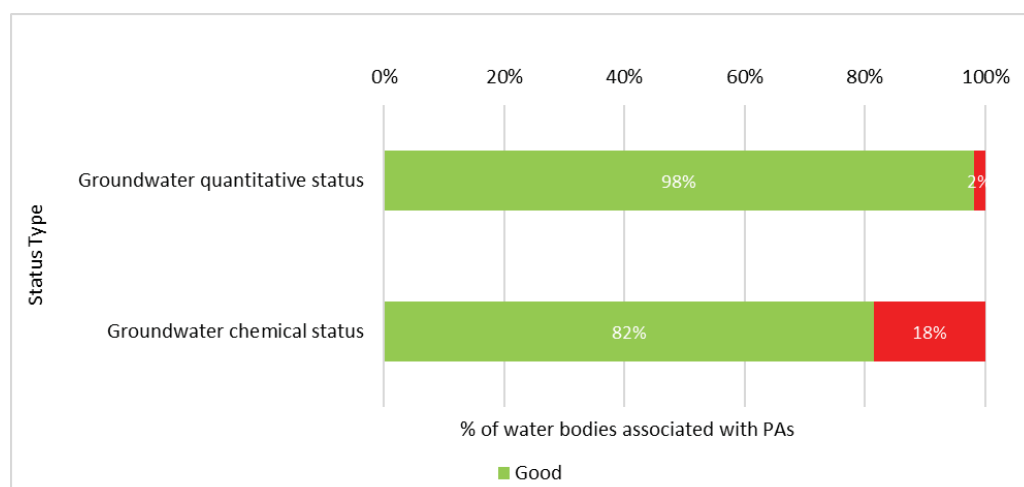
In the third RBMPs, Bulgaria reported protected areas of all types related to SWBs (Drinking Water Protection Zones; Bathing Waters; Nitrate Vulnerable Zones under the Nitrates Directive; sensitive areas under the Urban Wastewater Treatment Directive; Natura 2000 sites; national protected areas and areas designated for the protection of economically significant aquatic species); and protected areas of some types related to GWBs (Drinking Water Protection Zones, Nitrate Vulnerable Zones under the Nitrates Directive). In total, 2 165 protected areas were reported.

As regards surface water, however, regrettably there are no data available in the third RBMPs about the status of rivers, lakes, transitional and coastal waters associated with protected areas.

As regards GWBs compared to the second RBMPs the share of GWBs associated with protected areas having good chemical status increased (from 64% to 82%). Likewise, the share of GWBs associated

with protected areas having good quantitative status also increased (from 95% to 98%) compared to the second cycle of reporting.

Figure 6. Status of GWBs associated with protected areas in the third RBMPs



Note: Due to lack of electronic reporting, the status of SWBs associated with protected areas are not shown for the third RBMPs (2022)

Source: third RBMPs pdf documents

Additional objectives related to protected areas have been clearly established for Drinking Water Protection Zones, recreational waters and Natura 2000 zones. Some additional measures are directly targeted at protected areas; for example: ensuring ecological flows in Natura 2000 zones; controls, restrictions and prohibitions on certain practices to ensure that drinking water is protected; a ban on angling and commercial fishing in fish protection zones below minimum ecological flow; and a ban on water abstraction permits for hydropower plants in recreational zones.



3.5 What is being done to prevent/reduce hydromorphological pressures

Measures have been mapped against several key types of measures (KTM) to tackle these pressures, namely: KTM5 – ‘Improving longitudinal continuity’; KTM6 – ‘Improving hydromorphological conditions of water bodies other than longitudinal continuity’; KTM7 – ‘Improvements in flow regime and/or establishment of ecological flows’ KTM14 – ‘Research activities’; KTM17 – ‘Measures to reduce sediment from soil erosion and surface runoff’; KTM24 – ‘Adaptation to climate change’; and KTM99 – ‘Other key type measures reported under programme of measures’.

Consequently, when designing and implementing research-related measures, Bulgaria should make better and more systematic use of results from EU-funded research and innovation projects under this KTM. This research can support better action on water management including future water demand as well as climate change impacts, and pollution from substances such as pesticides, pharmaceuticals, PFAS and microplastics.

A draft methodology for determining ecological flows (e-flows) has been prepared and used to establish e-flows for all relevant water bodies, as part of the development of the third RBMPs. However, Bulgaria has not yet enforced these e-flows and has not established an explicit link between the implementation of e-flows and the review of permits to control water abstractions and impoundments. Relevant work is still ongoing, and it is planned to enforce these e-flows by the next RBMPs.

The third RBMPs present win-win measures that contribute to the objectives of the WFD, the FD and drought management. These measures comprise both basic and supplementary actions aimed at improving the ecological status of water bodies, reducing flood risk, and maintaining ecological flows – an essential component of drought resilience.

Moreover, nature-based solutions are included as part of the hydromorphological measures, mainly through actions such as re-meandering of rivers, riverbank restoration with bioengineering methods, floodplain reconnection, and wetland restoration. These measures are included under KTM5, KTM6, and KTM23 in the programme of measures and are applied to both new projects and improvements of existing modified river sections.

The gap assessment shows that while progress has been made, there are still a considerable number of SWBs, especially rivers, that have moderate status or below due to hydromorphological pressures. Restoring continuity, implementing e-flow requirements, and morphological improvements are considered necessary to reduce these gaps. However, the third RBMPs acknowledge that not all water bodies will achieve good status or potential by 2027, particularly in cases where pressures from hydropower, irrigation, or navigation infrastructure remain high.



3.6 What Bulgaria is doing for abstractions and water scarcity

Water abstraction affects both the quantitative status of GWBs and the hydromorphological elements of SWBs, impacting their ecological status.

Just as for the second cycle, water abstraction (understood as consumptive use or net consumption) is not identified as a significant pressure at RBD level or in significant portions of an RBD in Bulgaria. It has been assessed as a significant pressure only for individual water bodies; GWBs in the West Aegean RBD and SWBs predominantly in the East Aegean RBD.

Measures related to abstractions and water scarcity

Bulgaria has planned measures to address water abstraction/scarcity in general, as well as in those areas where water abstraction is identified as a significant pressure.

There is a concession, authorisation, and/or permit regime to control surface and groundwater abstractions and impoundments. Furthermore, there is a register of abstractions from surface water and groundwater and a register of impoundments. Small abstractions of up to 10 m³/day from surface or groundwater (excluding mineral waters) are exempt from permit controls, provided they are used only for covering own needs. Permits are issued by state authorities for a limited period, and they can be extended and are regularly reviewed upon each update of the characterisation of the RBMPs (six-year cycle). Furthermore, permits can be refused or revised under specific conditions, to maintain or achieve the environmental objectives in the RBMP.

Measures related to the control of abstractions (KTM7 – ‘Improvements in flow regime and/or establishment of ecological flows’) and water efficiency (KTM8 – ‘Water efficiency, technical measures for irrigation, industry, energy and households’) implemented in the previous cycle have been carried over. Other measures planned for the 2021-2027 period include 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’; KTM11 – ‘Water pricing policy measures for the implementation of the recovery of cost of water services from agriculture’; KTM13 – ‘Drinking water protection measures’; and KTM24 – ‘Adaptation to climate change’. These measures (KTM9, KTM10, KTM11) aim to enforce the ‘polluter

pays' principle by ensuring households, industry, and agriculture cover the full financial, environmental, and resource costs of their water use, making them interesting as tools to incentivise sustainable water management while addressing cost recovery gaps.

The third RBMPs also include natural water retention measures, intended to increase water supply, among other things. The natural water retention measures (KTM23) in Bulgaria's third RBMPs focus on restoring green infrastructure – such as wetland revival, floodplain reconnection, river meandering, and bioengineered riverbank stabilisation – to improve water storage, reduce flood risks, and improve ecological flows, targeting both new projects and degraded river sections, though coordination gaps between sectors remain (e.g. agriculture, hydropower).

Water reuse is mentioned only in the third RBMP of the Danube RBD as a potential approach specifically for the agricultural sector, focusing on the reuse of treated wastewater for irrigation.



3.7 Adaptation to climate change

Considering the close relationship between overall water management and floods management and the importance of climate change for both, considerations on droughts and floods are jointly addressed in this section.

According to existing climate change scenarios, Bulgaria is experiencing a trend of increasingly frequent extreme events and natural disasters, evidenced by frequent intense rainfall, heat and cold waves, floods and droughts, hurricanes, forest fires and landslides. The third RBMPs have analysed the impact of climate change on two significant sources of diffuse pollution: the agriculture and forestry sectors. In addition, the impact of climate change on biodiversity and ecosystem services is analysed.

Under the coordination of the ICPDR, the Climate Change Adaptation Strategy for the whole Danube Basin was developed in 2012, and was further updated in 2018. The third RBMPs refer to three national strategic documents related to climate change: the National Strategy and action plan for Climate Change Adaptation until 2030; the Long-term Strategy for Climate Change Mitigation until 2050; and the Integrated Energy and Climate Plan of the Republic of Bulgaria 2021-2030.

As regards floods, the FD requires that the impacts of climate change on the occurrence of floods be considered, and therefore in the preparation of Flood Hazard and Risk Maps (FHRMs) and Flood Risk Management Plans (FRMPs). While climate change was not included in the first FHRMs of Bulgaria, it is consistently covered in the second FHRMs based on a common national approach. Climate change scenarios are mapped for the medium probability scenario (100-year recurrence) for all sources covered by the maps: fluvial, pluvial, coastal and artificial water bearing infrastructure floods. The maps show the inundation depths under several scenarios based on representative concentration pathways (RCPs), global climate models and data from different sources. The scenarios considered are a 'pessimistic' climate change scenario (RCP8.5), an 'optimistic' scenario (RCP4.5), and a baseline scenario (i.e. no further climate change).

Compared to the first FRMPs, the consideration of climate change in the second FRMPs is more systematically explained. Climate change was integrated into the methodologies to identify, select and prioritise measures. Links with Bulgaria's National Adaptation Strategy (NAS) are explained and its priorities were taken into account in developing the FRMPs. These briefly present the scenarios considered and summarise their results, such as the percentage change in maximum river flood

discharges or maximum precipitation in the context of the RCP4.5 and RCP8.5 climate change scenarios in each Unit of Measurement, as well as the frequency of average flood peaks with a probability of more than 1%. Furthermore, climate change adaptation is one of the environmental benefits taken into account for the selection of measures. Consequently, all measures in the programmes of measures (PoM) and the APSFR have an adaptive capacity and contribute to achieving the objectives of the NAS.

Drought management

Bulgaria has not yet adopted a specific drought management strategy or plan. The only relevant document at national level is the National Programme for Measures in the Conditions of Drought Trend of 2001, which is very outdated, and is currently under review. Three out of four third RBMPs (the Danube, Black Sea and the West Aegean RBDs) have envisaged the development of a Drought Management Plan as a basic measure in the PoM accompanying the third RBMPs, with secured funding from the state budget. This is not the case for the East Aegean RBD, which is expected to be the second most affected RBD in terms of water scarcity and drought risks due to climate change⁴.

4. Policy elements contributing to zero pollution



4.1 Surface Water: what is their chemical status

Monitoring

The national surface water monitoring network that supports chemical status assessments has been reviewed and expanded. It now covers 49% of all rivers, 94% of all lakes and 100% of all coastal and transitional waters. The monitoring programmes consider all 45 priority substances.

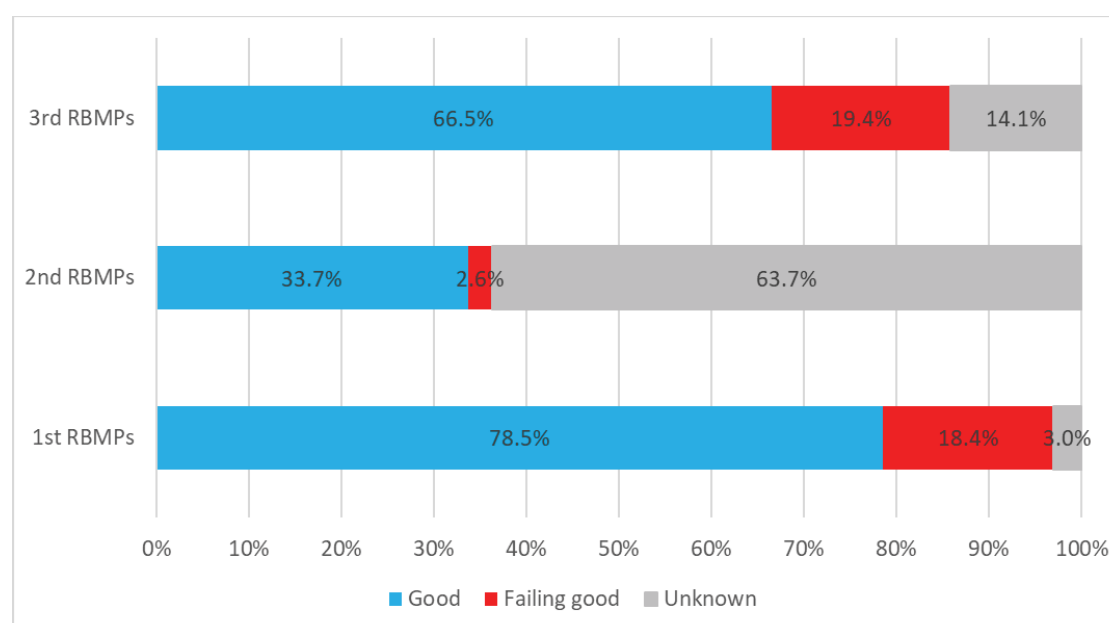
For all four RBDs, specific programmes are in place for monitoring the 20 priority substances in biota and sediments, the results have been used to carry out analysis of long-term trends. However, for a significant number of water bodies, monitoring data in biota and sediments were missing or only limited data were available.

Status assessment

Figure 7 shows the chemical status of SWBs also in comparison with previous cycles. The number of unknown assessments has decreased significantly, which means that knowledge of chemical status is better. However, there are still a considerable number of unknowns left that will need to be determined as soon as possible. There is a significantly higher number of water bodies for which the chemical status has either improved or worsened. It is not possible for the Commission to conclude what the main drivers are for these figures. It is unclear whether the figures represent a real improvement or worsening of the situation or whether it is simply the result of better knowledge of the status of water bodies. It would seem that out of the unknowns, around 30% have turned out to have good status and 20% bad status. The trends are unclear. Moreover, confidence in classification worsened, as 74% of the SWBs were classified for chemical status with low confidence, mainly due to the method used to group water bodies and the lack of sufficient monitoring data.

⁴ The Bulgarian authorities have subsequently informed that they plan to develop a nationwide Drought Management Plan, which will cover all four RBDs. This measure was reflected in three out of four of the third RBMPs but was overlooked in the third RBMP of the East Aegean RBD.

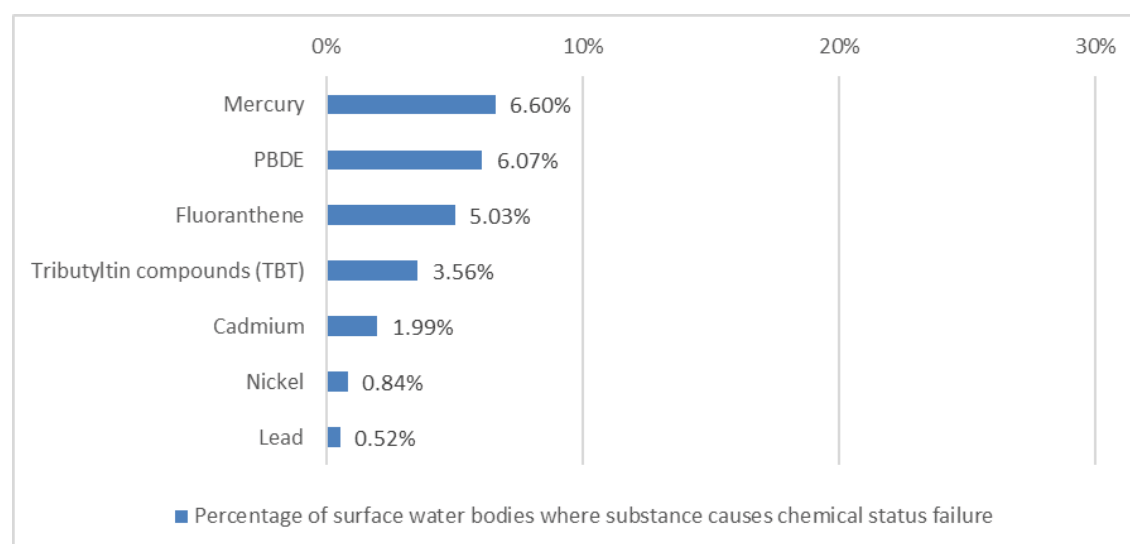
Figure 7. Chemical status of SWBs in Bulgaria in the first, second, and third RBMPs.



Source: third RBMPs pdf documents

As was the case for the second RBMP, mercury and brominated flame retardants are particularly problematic for achieving good chemical status, see Figure 8.

Figure 8. Priority substances causing failure to achieve good chemical status in SWBs in Bulgaria.



Source: third RBMPs pdf documents



4.2 Groundwater Bodies: what is their chemical status

Monitoring

Bulgaria delineated 169 GWBs both in the second and third RBMPs, with no changes in boundaries or total area. In Bulgaria, there are three transboundary GWBs.

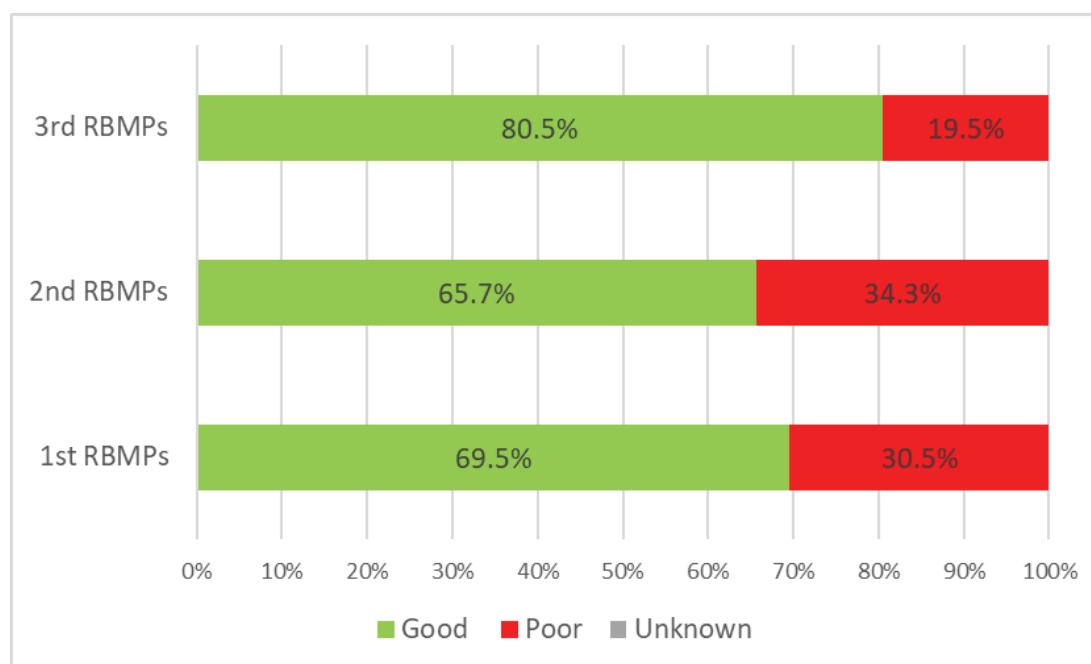
Chemical monitoring of GWBs has expanded slightly, now covering 99.4% of all GWBs (up from 97% in the second RBMPs). However, the share of GWBs subject to surveillance monitoring dropped from 97.0% to 93.5%, and operational monitoring decreased from 54.4% to 48.5%. Despite this, the total number of monitoring sites increased significantly (for example, surveillance sites rose from 238 to 493), suggesting a shift toward more targeted, optimised monitoring rather than reduced coverage.

Status assessment

Background levels for naturally occurring substances are taken into account when developing the respective threshold values in all RBDs. Figure 9 depicts the chemical status of groundwater bodies also in comparison with previous cycles.

According to these figures, the status of GWBs has improved significantly, which may seem at odds with the stated increased in pressures and impacts. This is largely due to methodological refinements, such as updated threshold values for natural pollutants, better differentiation between natural and anthropogenic sources, which reclassified some bodies as 'good' and reduced 'unknown status' classifications.

Figure 9. Chemical status of GWBs in Bulgaria in the first, second, and third RBMPs.



Source: third RBMPs pdf documents

Diffuse pollution from agriculture, settlements without sewerage and, in a few cases, industrial activities and landfills are the causes for the failures. The top five groundwater pollutants causing failure to achieve good chemical status are nitrates, manganese, sulphate, phosphate and ammonia. 10 GWBs (5.9%) have been assessed as failing to achieve good chemical status. This is related to the deterioration of drinking water quality in these GWB.s Multiple causes can affect a single GWB.



4.3 What Bulgaria is doing to combat pollution from agriculture

Bulgaria has adopted basic measures, such as those under the Nitrates Directive action programme. Those are complemented by a number of supplementary measures, such as measures under KTM2

– ‘Reduce nutrient pollution from agriculture’; KTM3 – ‘Reduce pesticides pollution from agriculture’; KTM11 – ‘Water pricing policy measures for the implementation of the recovery of cost of water services from agriculture’; KTM12 – ‘Advisory services for agriculture’; KTM14 – ‘Research, improvement of knowledge base reducing uncertainty’; and KTM17 – ‘Measures to reduce sediment from soil erosion and surface runoff’ are reported, most of them in all four RBDs.

The third RBMP pdf documents provide only a general description of implementation of the measures from the second RBMPs. This includes listing whether measures have been implemented and whether the proposed measures are carried over from the previous cycle. It is noticeable that there are no measures addressing agricultural pollution reported as not having been implemented.

Information about the costs and the funding sources of all measures in the programme of measures is presented. For a limited number of measures addressing agricultural pollution, there is also additional information, such as their cost per year, and what part of the cost is covered by a specific source of funding (e.g. state budget, private funding, EU programmes). It is concerning to note that there is no gap assessment in terms of a quantitative estimation of the need to reduce nutrient loads (in nitrogen or phosphorus loads related to agriculture) or to reduce the use of pesticides. However, the RBMP of the Danube notes that the MONERIS model was used in the international RBMP of the Danube as a tool to estimate nutrient loads from point and diffuse sources and the required nutrient reduction. Nevertheless, there is no specific reference to nutrient management in the context of cross-border cooperation.

There is also no assessment of the effectiveness of the planned agricultural measures for the WFD objectives, though a general description of the aim of the measure is provided.

The Bulgarian CAP Strategic Plan supports commitments to protect water quality on almost 19% of utilised agricultural area (UAA), to enhance nutrient management on 17% UAA and improve sustainable use of pesticides on 39% UAA by 2027.



4.4 What Bulgaria is doing to combat pollution from other sectors

The third RBMPs plan basic measures to address non-agricultural pollutions, such as KTM1 – ‘Construction or upgrades of wastewater treatment plants’; KTM4 – ‘Remediation of contaminated sites (historical pollution including sediments, groundwater, soil)’; 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’; KTM14 – ‘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’; KTM21 – ‘Measures to prevent or control the input of pollution from urban areas, transport and built infrastructure’; KTM99 – ‘Other key type measure’, including elements such as construction of facilities preventing the spread of pollutants in water and the prohibition of activities leading to the discharge of hazardous substances (prohibition of untreated industrial wastewater releases into surface waters, enforced through permit regimes, restrictions on mining activities to prevent heavy metal like lead, cadmium and cyanide leaks into rivers/groundwater or bans on specific agricultural practices in vulnerable zones).

Most measures address pollution arising from urban wastewater discharges, industrial activities and transport. Planned supplementary measures include:

- use of natural wastewater treatment methods;

- construction or upgrading of wastewater treatment plants;
- limiting pollution from past activities; research to detect contamination of surface water and groundwater and identify their sources;
- preventing discharge of priority substances into groundwater;
- improving water management in water protection zones;
- improving assessments of surface water chemical status;
- ensuring adequate treatment of production wastewater;
- implementation of the procedure to review wastewater discharge permits issued;
- implementation of projects to reduce pollution from industrial wastewater discharged into the sewers of settlements;
- reducing pollution from mining activities;
- improving monitoring and governance;
- closure and reclamation of landfills.

Measures have been planned to address each specific problem/driver. However, the expected effects of the measures are described only in very general terms (for example, achieving good chemical status by 2027). Regrettably, no details are included on how much the measures are expected to reduce each pressure.



4.5 What Bulgaria is doing to combat significant pressures – overall assessment of the Programmes of Measures

Bulgaria has identified a total of 2 732 measures, comprising 1 888 basic measures and 844 supplementary measures associated with all predefined KTMs except KTM25 – ‘Measures to counteract acidification’. The measures cover both SWBs (rivers, lakes, transitional and coastal waters) and GWBs, as well as protected zones (drinking water sources, bathing waters, nutrient-sensitive zones). The basic measures are largely harmonised across all four third RBMPs, while the supplementary measures are highly dependent on the specific regional pressures and challenges in each RBD. This reflects a good level of adaptation of the PoMs to local environmental conditions, but there is also some variability in the level of detail and ambition between the RBDs. All RBDs have planned at least one KTM linked to identified significant pressures (such as diffuse pollution, hydromorphology, abstraction and chemical pressures).

In all four third RBMPs, measures are systematically linked to specific pressures and sectors, with clear allocation to KTMs. This structured approach ensures alignment with the WFD reporting system and improves the targeting of interventions.

A qualitative assessment of the cost-effectiveness of the PoMs was conducted according to a national methodology. Bulgaria applies the same approach for cost-effectiveness analysis (CEA) in three out of four third RBMPs (Danube, Black Sea and East Aegean). This assessment should evaluate the costs of the measures for achieving the stated goal, selecting actions that deliver the highest improvement of water status per euro invested. However, the third RBMPs of these RBDs do not provide further information and conclude that a more detailed CEA is not necessary or possible, because only basic measures are anticipated for each water body. The PoMs furthermore state that these basic measures are all mandatory without alternatives, so it is not possible to undertake a CEA. It can be noted that the PoMs also report a number of supplementary measures, which seems to contradict the conclusion in the PoMs that it is not relevant or possible to undertake a CEA. The estimated overall financing requirement to implement the measures under the PoMs for the period 2022–2027 is

approximately EUR 2.1 billion, with about EUR 710 million to come from EU Funds – mainly the ‘Environment’ programme, the Recovery and Resilience Facility and the strategic plan for agriculture and rural development.

The PoMs intend to maximise synergies between different policy frameworks, optimise the use of resources, and prevent duplication of actions across sectors. Several of the planned measures serve multiple objectives under different directives (namely the FD, Habitats Directive, Nitrates Directive and MSFD).

All four RBDs of Bulgaria are international, so transboundary cooperation is essential to successfully achieve the WFD objectives. The PoMs acknowledge this, by highlighting Bulgaria’s participation in international coordination frameworks and mechanisms, particularly for the Danube and the Black Sea.

5. Exemptions and economics



5.1 To what extent are exemptions applied in Bulgaria

The WFD allows for some exemptions, but these should be used only where necessary and be properly justified.

As good status has not been achieved in all water bodies, Bulgaria has applied a significant number of exemptions under WFD Article 4(4), Article 4(5) and Article 4(7) in the third RBMPs (Table 3).

Table 3. The use of exemptions for the WFD in SWBs and groundwater bodies (GWBs) in Bulgaria.

Article	GWBs	SWBs
4(4) Technical feasibility	3 GWBs for quantitative status (1.8%) 18 GWBs for chemical status (10.7%)	271 SWBs for ecological status/potential (28.4%) 107 SWBs for chemical status (11.2%)
4(4) Natural conditions	0 GWBs for quantitative status (0%) 11 GWBs for chemical status (6.5%)	301 SWBs for ecological status/potential (31.5%) 67 SWBs for chemical status (7.0%)
4(5) Infeasibility	0 GWBs for quantitative status (0%) 4 GWBs for chemical status (2.4%)	18 SWBs for ecological status/potential (1.9%) 14 SWBs for chemical status (1.5%)
4(6)	Not applied	Not applied
4(7)	Not applied	2 SWBs for ecological status/potential (0.2%) 0 SWBs for chemical status (0%)
GWD 6(3)	Not applied	–

Note: Articles 4(4) and 4(5) have not been invoked on the ground of disproportionate costs.

Source: third RBMPs pdf documents

Article 4(4) has been invoked to exempt 378 SWBs (39.6%) on the grounds of technical feasibility and 368 SWBs (38.5%) on the grounds of natural conditions. Furthermore, Article 4(4) has been

invoked to exempt 21 groundwater bodies (12.5%) on the grounds of technical infeasibility and 11 groundwater bodies (6.5%) on the grounds of natural conditions.

Article 4(5) has been invoked to exempt 32 SWBs (3.4%) on the grounds of infeasibility. Furthermore, four groundwater bodies (2.4%) have been exempted on grounds of infeasibility.

In the third RBMP pdf documents, drivers and impacts which lead to the application of Article 4(4) and 4(5) exemptions have been assessed and clearly outlined in all RBDs. Justifications are set out at individual water body level, while the context and the logic of each exemption is clearly described.

Just as in the previous cycle, Article 4(6) has not been invoked to exempt any water body. The same can be said about the Article 6(3) of the Groundwater Directive.

Article 4(7) has been invoked to exempt modifications (changes to the physical characteristics) of two SWBs. The third RBMPs report clearly, for each Article 4(7) exemption, the type of the new modifications planned. They also provide water body-specific information, including the expected impact on the status of affected water bodies, mitigation measures and the assessment of overriding public interests and better environmental options.



5.2 Use of economic analysis and water pricing – cost recovery

The economic analysis identifies four major ‘water user sectors’, namely agriculture, industry, services and households (and for the Danube and Black Sea RBMPs also navigation), as well as an unusually wide range of water services exceeding the definition in WFD Article 2(38) and approaching the usual list of all water uses. These services are: public supply of drinking water; sewerage; public (urban) wastewater treatment; public water supply for irrigation by the state monopoly utility ‘Irrigation Systems EAD’; self-abstraction per water user sector; water storage; hydropower generation; navigation and flood prevention (occasionally as ‘protection from the harmful effects of water’). Notably, for all these services, a financial and a total cost recovery rate is calculated per RBD and for the three ‘classical’ water services (drinking water and the two sanitary services, namely sewerage and wastewater treatment) also per water user sector.

All four third RBMPs provide information on the economic analysis items listed in Annex III of the WFD, notably long-term forecasts of water supply, differentiated over source type, and of water demand, differentiated over user types/sectors (households, industry, agriculture, services), as well as volume, costs and price estimates associated with the various water services for 2018 and one future year beyond the current programming period. The updated economic analysis includes the use of more detailed data on financial costs and revenues, including improved interpolations to fill data gaps; and the use of an alternative approach to appraise environmental and resource costs.

The third RBMP and background documents provide ample information on the current water pricing arrangements, covering the various water services and uses. They are relatively detailed in describing abstraction and pollution charges. The unit rates defining the various abstraction fees differ for surface water and groundwater and also over the various types of water use. For instance, there is a higher unit rate for self-abstraction of drinking water from groundwater in order to limit this consumption and to encourage use of public water supplies instead. The differentiation of pollution charges as regards destination, the number of discharges and the degree of treatment is achieved by applying correction coefficients on a basic rate, a separate (additional) charge for less treated industrial wastewater, and a charge for discharges into groundwater. In addition, an adjustment factor is set for the increase in the charge for abstraction – for self-abstraction and for pollution in water protection zones and vulnerable aquatic ecosystems, among others. There are also exemptions,

such as for low volumes of water abstraction by households and for diffuse pollution from small-scale husbandry and aquaculture. However, regrettably, they do not draw conclusions on whether or not the pricing policies provide appropriate incentives for more efficient water use.

The reports focus more information on the regulation regime for the tariffs on final users than tariff structure. The EWRC regulates the consumer/final markets for water supply and sewerage services provided through 42 operators⁵ over the whole of Bulgaria, which vary considerably in size and ownership structure. The regulation concerns price setting and quality of service. Based on common criteria and guidelines, the EWRC reviews each individual operator's five-year business plans and sets a ceiling on its tariffs, based on a set of factors, including inflation, the capacity to achieve efficiency savings and affordability considerations. Despite the absence of an explicit explanation of the 'appropriate incentives' requirement, the available information suggests that the water pricing policy provides limited incentives to encourage more efficient use of water, but provides improvements over time through gradual pricing reforms.

Bulgaria presents a wide range of both financial and total cost recovery rates for multiple years, with geographical and sectoral differentiation mainly for the four large water user sectors and four RBDs, based on a national methodology. Unfortunately, the RBMPs lack some important explanations as regards the calculation method and outcomes, interpretation of the results and their policy implications, which makes it difficult to know how to interpret the outcomes and to infer the reasons for variation across time, across RBDs and across user groups/sectors. For instance, the cost recovery assessment for the three classical water services (water supply, wastewater collection and wastewater treatment) seem to rely on an assumption on how costs are distributed over these services in order to overcome data constraints. However, the resulting rates are presented without any interpretation. The only clear outcome appears to be agriculture's much lower cost recovery. In addition, as regards the recovery rates for self-abstraction, the reports do not explain whether the stark difference between the nearly full recovery by households and very modest recovery by agriculture and other users reflects policy-induced implicit subsidies or merely a difference in the cost scope under consideration. This illustrates that the RBMPs do not explain whether the contributions from the various water user sectors can be considered adequate. Neither do they explain which cost recovery mitigation factors and 'established practices' exemption (from WFD Articles 9(1) and 9(4) respectively) have been called upon for the incomplete cost recovery.

Bulgaria has carried out commendable work on estimating environmental and resource costs for all the different water services. These estimates have informed the calculation of the total costs recovery rates. Unfortunately, the RBMPs do not explain why resource costs appear to differ across water uses and water user sectors (as seems the case for self-abstraction), while from a scarcity perspective, the unit resource costs should be equal. This seems to blur the cost and recovery side of cost recovery efforts and impedes understanding of the relative weight given to water efficiency and to socio-economic fairness considerations.

The third RBMPs provide only a general assurance for the application of the polluter pays principle. However, the elaborate description of the abstraction fees and pollution charges identifies the water users abstracting or polluting water and points out how the various fees and charges aim to target them depending on the size of their polluting pressures. The only missing part concerns the lack of an explicit link between the resource and environmental cost estimates and the corresponding unit rates for the abstraction fees and pollution charges.

⁵ Based on the approved business plans covering the 2022-2026 period.



6. WFD recommendations

Bulgaria should:

Increase the level of ambition and accelerate actions to reduce the compliance gap as much as possible by 2027. This implies tackling obstacles identified in implementing measures such as administrative capacities and resources.

- 1.** Increase investments and ensure adequate funding, including implementation of EU Cohesion Policy funding, to effectively implement the programmes of measures to reach the objective of the WFD by, for example, developing long-term investment plans and clearly identifying the source of financing for implementing all measures.
 - a) Present a gap analysis to achieve compliance with the UWWTD and analyse how the investments planned for the next cycle will contribute to closing the gap.
- 2.** Identify and put in place additional measures to reduce existing persistent environmental challenges (pressures) which prevent the achievement of good status. This implies, for example:
 - a) the measures show the expected results to achieve the objectives set for each water bodies
 - b) reduction of nutrients and other chemical pollution to achieve the objectives of the WFD and Nitrates Directive
 - c) have a clear and transparent method for selecting RBSPs and update the list of RBSPs included in Annex 7 of Regulation H-4 and determine/specify the EQS for them;
 - d) stepping up efforts to implement all necessary restoration and mitigation measures, in particular by prioritising nature-based solutions;
 - e) ensure that mitigation measures show exactly how their implementation improve the status of the various BQEs.
- 3.** In light of the challenges of water scarcity experienced across the EU, Bulgaria should:
 - a) finalise the implementation of e-flows in all the water bodies. An explicit link should be established between the implementation of e-flows and the authorisation process and/or review of permits to control water abstractions and impoundments. E-flows should be developed in cooperation with neighbouring countries, in the case of transboundary water bodies;
 - b) take effective measures to promote water reuse.
- 4.** To more effectively achieve the objectives of the WFD, Bulgaria should further improve transboundary cooperation such as:
 - a) international cooperation with Greece, Serbia and North Macedonia;
 - b) reference conditions should be coordinated between Bulgaria and Türkiye.
 - c) improve international cooperation on water abstraction/scarcity issues, considering climate and socio-economic projections that indicate significant reductions in water availability in the future.
- 5.** On the use of economic tools, Bulgaria should:

- a) present more transparently an updated economic analysis for a time period closer to the programming period, due to the considerable changes over time in policies, investments and pricing;
 - b) finalise the transposition into their national legal order the CER Directive (Directive (EU) 2022/2557 - CER Directive) to ensure the continued provision of services that are of vital importance for EU society and economy in key sectors such as water;
 - c) present its detailed qualitative description of the wide range of pricing instruments with an explicit explanation of the adequacy of the price incentives to increase the efficiency of water use, and how regulatory oversight and gradual price reforms would further improve the effectiveness of pricing. The reporting should provide an analysis of the calculated recovery rates, including a justification of the identified cases of less than full cost recovery at the hands of the cost recovery mitigation factors from WFD Article 9(1) and the grounds to invoke an 'established practices' exemption according to WFD Article 9(4), as well as an explanation of the application of the Polluter Pays Principle and the adequacy of the contributions by the various water users sectors.
- 6.** As regards monitoring, assessment, data management and reporting Bulgaria should:
- a) continue working towards closing the remaining gaps in assessing pressures/impacts (monitoring data, models, statistical and methodological instruments);
 - b) establish clear and consistent methodologies, including stable baselines across cycles, to help ensure data comparability and avoid distortions in results due to methodological changes;
 - c) further develop the classification system for the physico-chemical quality elements used to assess the ecological status of coastal waters, which is currently not type-specific. The developed and implemented hydromorphological monitoring methodologies should be tested to ensure they are providing reliable data and further fine-tuned as needed, and related monitoring should be carried out to its full capacity.

SECTION B:

FLOODS DIRECTIVE

7. Flood risk management under floods directive (FD)

The Directive requires each Member State to: scan its territory for flood risks; assess the potential adverse consequences of future floods for human health the environment, cultural heritage and economic activity identify significant risks; map the flood extent and potential adverse consequences; and take measures to reduce flood risk. These activities are reflected in: (a) the preliminary flood risk assessments, or PFRAs (including identifying areas of potential significant flood risk, or APSFRs) (b) preparing flood hazard and risk maps, or FHRMs; and (c) establishing flood risk management plans, or FRMPs. The preliminary assessments, mapping and planning for flood risk are repeated in six-yearly cycles.

There are four Units of Management (UoMs) in Bulgaria, which are the same as the Water Framework Directive's River Basin Districts (RBDs). Fluvial, pluvial, sea water and artificial water bearing infrastructure floods are considered as potentially significant sources of flooding in Bulgaria. Bulgaria has designated 127 APSFRs. The impacts of climate change on flood risk were considered in Bulgaria at the time of the second PFRAs. No climate change scenarios were developed specifically for Bulgaria (see Section 3.7 for further details). The analysis of climate change impact on key precipitation indicators is based on:

- o regional climate projections of RCP scenarios (RCP4.5, RCP8.5) of the IPCC for the periods 2031-2060, 2051-2080 and 2071-2100;
- o influences of macroclimatic regimes on extreme phenomena, by studying the correlation between indices of atmospheric or oceanic long-period fluctuations and climate series with data from ground stations from the national meteorological network, or data from climate reanalysis;
- o data from the project CORDEX (Coordinated Regional Climate Downscaling Experiment) and specifically the sub-project MED-CORDEX – developed for the Mediterranean.



7.1 Flood hazard and risk maps (FHRMs)

Bulgaria published FHRMs in pdf format on the websites of each RBD Directorate⁶, distinguishing between hazard and risk maps grouped per APSFR. In addition, the maps are available on the national GIS system – the Information System for Flood Risk Management⁷.

FHRMs were prepared for all APSFRs based on a common national methodology. Maps for floods with low probability (1/1 000 years as well as an 'extreme event scenario of infrastructure damage' in selected APSFRs), with medium probability (1/100 years) and with high probability (1/20 years) are provided. For each APSFR and probability, separate maps are available according to flood type (this includes fluvial, pluvial, and sea water in the coastal APSFRs, and in selected cases – infrastructure changes such as destruction of dam walls).

All maps show:

- flood extent;
- water depth and flow;

⁶ [Danube RBD: FHRMs 2022-2027](#); [Black Sea RBD: FHRMs 2022-2027](#); [East Aegean RBD: APSFRs and FHRMs 2022-2027](#); [West Aegean RBD: FHRMs 2022-2027](#).

⁷<https://isurn.moew.government.bg/ISURN.Web/?configUrl=https://isurn.moew.government.bg/ISURN.Web/BaseProject/Config/PURN/config.json#/>.

- flow velocity;
- number of inhabitants;
- type of economic activity;
- installations as referred to in Annex I to Council Directive 96/61/EC (Directive on Integrated Pollution Prevention and Control) and other significant sources of pollution;
- critical infrastructure; and
- cultural heritage sites.

Areas protected under the Water Framework Directive, other than Natura 2000 areas, are not shown on the maps. Background documents suggest that the maps show the number of water bodies that could be affected by pollution during a flood.

For the second FHRMs, Bulgaria reported also a national GIS system. Its publicly available part shows different stages of FD implementation, including the APSFRs and the FHRMs. This includes flood hazard map and flood risk map layers similar to the maps provided in pdf format. In addition, it allows visualisation of different flooding sources or flood hazards and flood risks shown on the same map.

However, some of the map layers in the GIS system are less detailed than the pdf versions (for example, GIS hazard map layers show the extent of the flooding for different flood sources and probabilities but not water depth or flow velocity) and the GIS system provides fewer contextual details than the pdf maps. The best practices identified in the previous reporting cycle are still valid for the FHRMs in pdf format; they address all relevant elements, and each file contains multiple pages zooming in on different quadrants of the APSFR with clear legends and notes about contextual information. However, contextual information about the general purpose, intended use or limitations is still missing in all versions of the maps.

In terms of changes in methodologies used to prepare flood hazard maps since the first FHRMs, the main changes are the inclusion of two additional sources of flooding (pluvial and artificial water bearing infrastructure), the inclusion of climate change in the flood hazard maps and an update of coastal flood mapping approach. Regarding changes in methodologies used to prepare flood risk maps since the first FHRMs, the national methodology highlights the improvement in the risk assessment approach by developing an empirical method for assessing damage and vulnerability of risk receptors.

Climate change in the second FHRMs

As regards the consideration of climate change effects in the preparation of FHRMs, reference is made to Section 3.7 on 'adaptation to climate change'.



7.2 Flood risk management plans

Objectives and measures

The four FRMPs can be downloaded online from the web pages of the RBD Directorates⁸. Bulgaria's FRMPs identify five priorities for flood risk management and 24 national objectives under these priorities. These build upon the five priorities and 17 objectives defined in the first FRMPs. They cover

⁸ [Danube FRMP 2022-2027](#); [Black Sea FRMP 2022-2027](#); [East Aegean FRMP 2022-2027](#); [West Aegean FRMP 2022-2027](#).

minimising adverse consequences of flooding, reducing the likelihood of flooding, and non-structural approaches. For example, two of the five priorities concern non-structural approaches: one on improving the population's awareness, preparedness and response; and the other on improving administrative capacity, solidarity, data and information, future risks, financing and resources. The objectives include: protecting human health; protecting economic, technical and critical infrastructure sites against floods; enhancing environmental protection; and protecting cultural heritage. The objectives are linked to the measures and to quantitative indicators, making them specific and measurable.

The FRMPs include measures to be implemented at the APSFR, UoM and national levels. These measures are based on a national catalogue of measure types. Bulgaria reported 638 measures together with the priorities of all its measures. The FRMPs describe the methods to identify, select (including a cost-benefit analysis - CBA), and prioritise measures (including a multi-criteria analysis - MCA). The FRMPs describe the approach for monitoring and identifying indicators for these purposes. Measures are linked to objectives and indicators under three levels of monitoring, covering implementation of the measures (implementation monitoring), progress of the measures (results monitoring), and achievement of flood risk management objectives after completion of the measures (objectives monitoring). The FRMPs also describe the progress of measures under the first plans. The annexes of the FRMPs provide detailed analyses per APSFR that incorporate specific findings, data and maps from the PFRAs and FHRMs, and this information is linked to the selection of measures for each APSFR.

Natural water retention measures (NWRMs) are found in all plans based on a floodplain analysis to identify potential floodplains and catchment areas suitable for the implementation of NWRMs. The national catalogue of measures covers, in the definition of measure types, several issues related to nature protection and ecosystem services; the MCA used for the prioritisation of measures does so as well. These issues include: the potential co-benefits of all measures in relation to fisheries; habitat creation; improving the coherence and connectivity of the Natura 2000 network; river renaturation; sediment management; reconnecting floodplains and wetlands; water resources; human health and well-being through recreation and flood resilience; carbon sequestration; and mitigating the impact of climate change on vulnerable ecosystems.

Bulgaria has reported that coordination with the WFD was an aspect considered in all its FRMPs. A dedicated chapter in each plan explains the coordination of the FRMPs with the WFD and other EU directives: the Birds Directive; the Habitats Directive; the Seveso Directive; and the Industrial Emissions Directive. Ensuring benefits of the measures in other areas, and their consistency with other EU directives, has been taken into account at different stages of the development of the PoM: 1) by analysing types of measure for the national catalogue of measures; 2) through identifying suitable measures; 3) in assessing the measures (extended CBA); and 4) in prioritising the measures (MCA).

Consideration of climate change in the second FRMPs

As regards the consideration of climate change effects in drawing up FRMPs, reference is made to Section 3.7 on 'adaptation to climate change'.

Governance

All four FRMPs were coordinated with neighbouring EU and non-EU countries as part of EU or bilateral agreements for cooperation and information exchanges. The process for coordination at each stage of the FD implementation cycle (PFRAs, FHRMs, FRMPs) is described in the plans.

In all four UoMs, the competent authorities tried to ensure public consultation and active involvement of stakeholders, using a broad range of methods from an early stage in planning. As a result, a wide range of stakeholders contributed actively during the various stages of the plan development. Detailed information about the comments received from stakeholders, together with information on how each comment is addressed, are available on the websites of the RBD Directorates.

Progress identified in the second FRMPs

The second FRMPs include several significant improvements:

- o their annexes include detailed analyses per APSFR, incorporating the results of the PFRAs and FHRMs, CBA, climate change and other considerations into the selection of measures;
- o the results of the CBA are provided measure by measure, for all APSFRs and in all FRMPs and their annexes;
- o the consideration of climate change is more systematically explained. Climate change was integrated in the methodologies to identify, select and prioritise measures;
- o more measures undertaken under the WFD are identified, and more information on coordination of measures with the WFD and other Community Acts is provided.



8. FD recommendations

Based on the reported information and the FHRMs and FRMPs assessed, Bulgaria should:

in the FHRMs:

- the GIS based map should become the main map, supported, if necessary, by pdf maps;
- the FHRM should consider, besides Natura 2000 areas, any other potentially affected protected areas identified in Annex IV(1)(i), (iii) and (v) to Directive 2000/60/EC.

in the FRMPs:

- provide links to the national geoportal where all FHRMs can be viewed;
- present timelines for achieving the objectives;
- provide information on the expected timetables for the implementing measures;
- provide more information on measures addressing the protection of cultural heritage and insurance;
- provide more details about the specific stakeholders actively involved in the consultations.