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Third River Basin Management Plans Second Flood Hazard and Risk Maps and Second Flood Risk Management Plans
Member State: Estonia

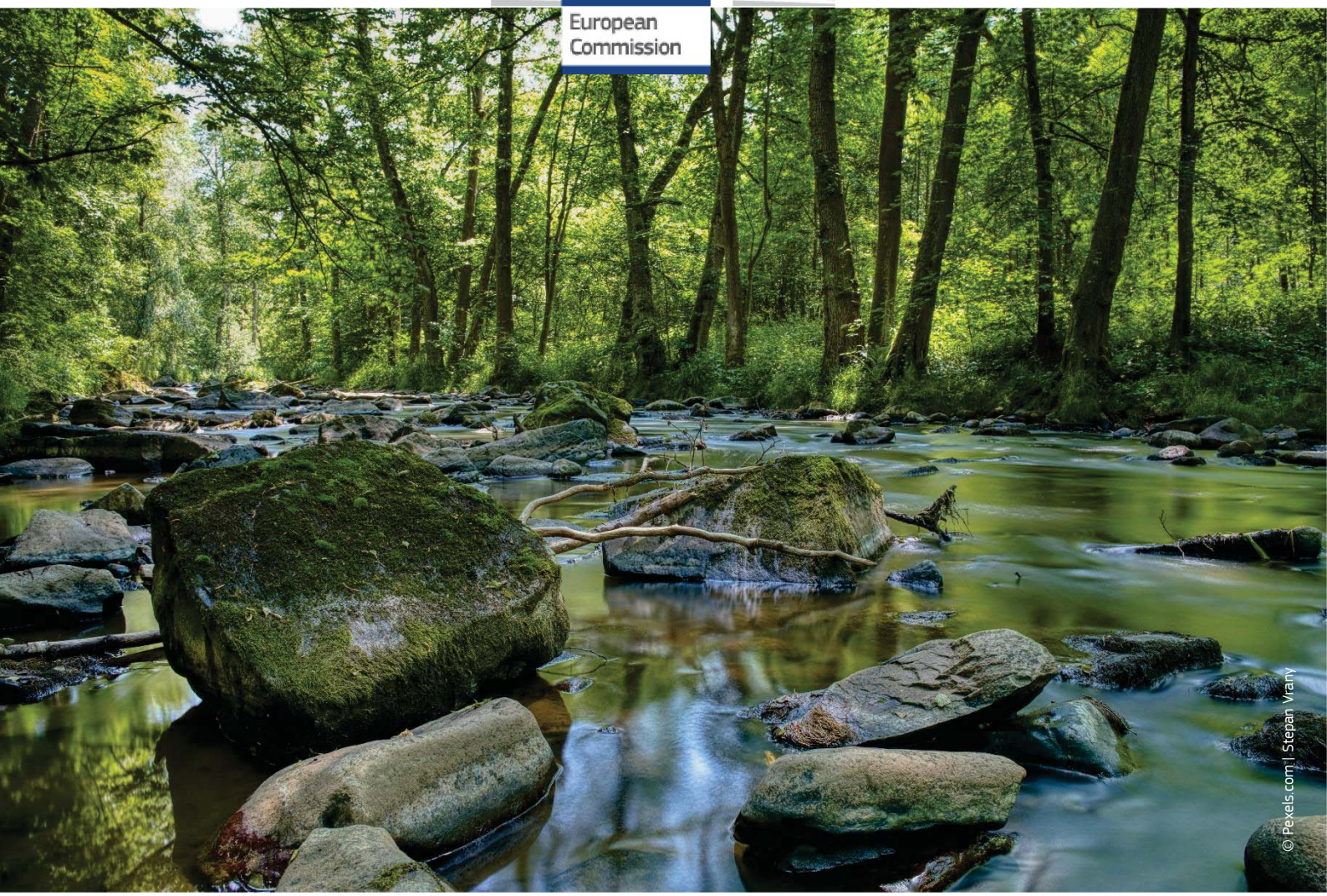
Accompanying the document

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

{COM(2025) 2 final} - {SWD(2025) 13 final} - {SWD(2025) 14 final} - {SWD(2025) 15 final} - {SWD(2025) 16 final} - {SWD(2025) 17 final} - {SWD(2025) 18 final} - {SWD(2025) 19 final} - {SWD(2025) 20 final} - {SWD(2025) 21 final} - {SWD(2025) 22 final} - {SWD(2025) 23 final} - {SWD(2025) 24 final} - {SWD(2025) 25 final} - {SWD(2025) 27 final} - {SWD(2025) 28 final} - {SWD(2025) 29 final} - {SWD(2025) 30 final} - {SWD(2025) 31 final} - {SWD(2025) 32 final} - {SWD(2025) 33 final} - {SWD(2025) 34 final} - {SWD(2025) 35 final}

European Commission



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Country specific staff working document

Estonia

ENVIRONMENT

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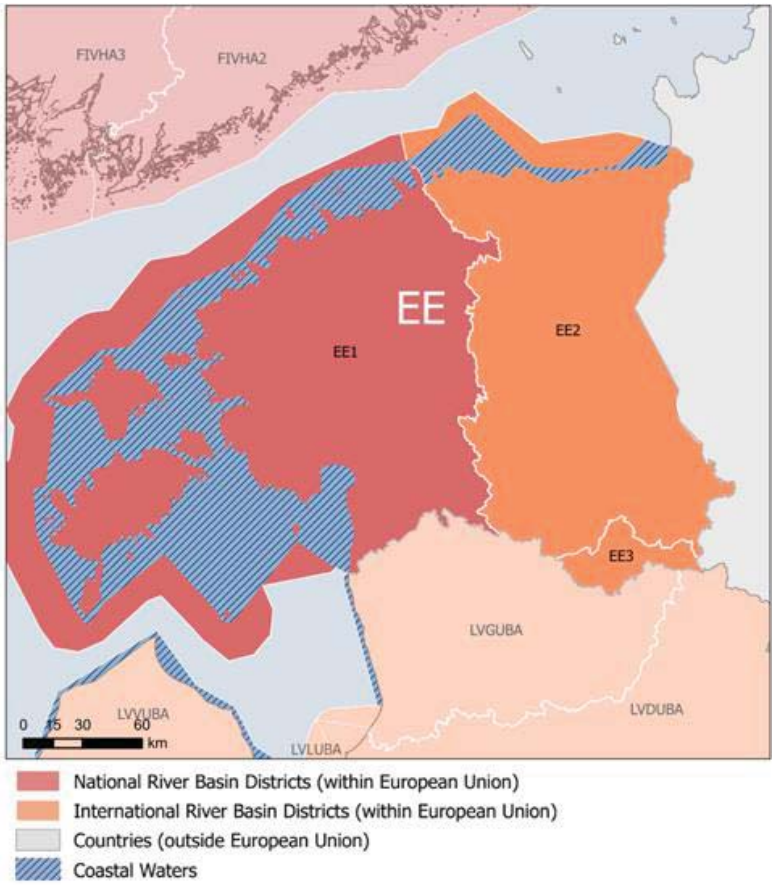
Content

SECTION A:

WATER FRAMEWORK DIRECTIVE

1. General info, member state characterisation

Estonia, the northernmost country of the three EU Baltic States, extends over 45 330 square kilometres[1] and has a flat terrain in general with highest point reaching 318 m (Suur Munamägi), and over 2 000 islands. Being among the least densely populated countries in Europe, Estonia has 1 365 884 inhabitants[2], a large share lives in the capital city Tallinn (around 400 000 inhabitants). Half of the Estonian territory is covered by forests and almost a quarter is protected by different legal regimes. Currently, 20.9% of Estonia's terrestrial territory is designated as protected areas, which is slightly below the EU value of 26.4%[3].



Estonia has three River Basin Districts (RBDs) and all of them are parts of international RBDs (Table 1). It is worth noting that the other countries sharing those RBDs are Latvia, as well as Russia.

In total, Estonia has 746 surface water bodies that are mainly river tributaries and 31 groundwater bodies (Table 2). To be noted that Estonia did not report transitional waters.

Just as it was the case in the 2nd River Basin Management Plans (RBMPs), surface water bodies in Estonia remain largely in their natural state, with around 7.1% of surface water bodies are heavily modified (HMWBs) and 5.7% are artificial water bodies (AWBs).

Table 1. Overview of Estonia's RBDs

RBD	Name	Size (km²)	Coastal water area (km²)	Countries sharing RBD
EE1	West-Estonian	45 383	12 949	LV
EE2	East-Estonian	23 759	1 552	LV, RU
EE3	Koiva	1 309	0	LV, RU

Source: WISE electronic reporting

[1] Eurostat – Area by NUTS 3 region (not including territorial waters): https://ec.europa.eu/eurostat/databrowser/bookmark/fabcfca6-4abb-4a84-ac1c-7bb335af436a?lang=en
[2] Eurostat – Population change – Demographic balance and crude rates at national level:
[3] Biodiversity Information System of Europe: https://biodiversity.europa.eu/countries/estonia

Table 2. Number of water bodies and the total length (km) of rivers, as well as total area (km^2) of lakes, coastal waters, territorial waters and groundwaters.

RBD	Rivers		Lakes		Coastal waters		Territorial waters		Groundwaters	
	No	Total length (km)	No	Total area (km^2)	No	Total area (km^2)	No	Total area (km^2)	No	Total area (km^2)
EE1	7	6 109	3	73	14	12 934	1	8 927	15	58 362
EE2	266	5 278	43	1 900	2	1 553	1	1 787	14	51 224
EE3	22	373	7	8	0	0	-	-	2	2 059
Total	635	11 760	93	1 980	16	14 488	2	10 714	31	111 646

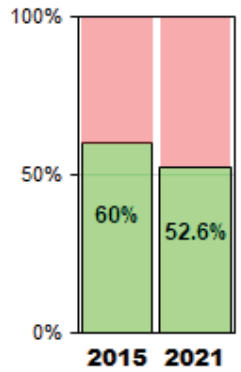
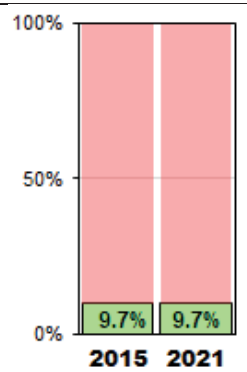
Source: WISE electronic reporting

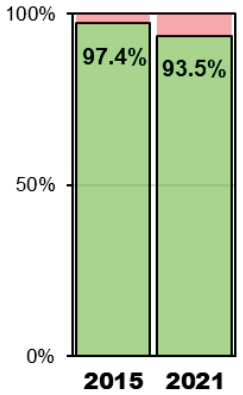
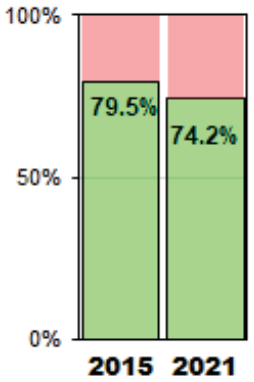
Reporting

The deadline for reporting the 3rd RBMPs was in March 2022. The Commission and the EEA together with Member States developed an electronic reporting system in WISE (Water Information System for Europe). Its use was voluntary. Some Member States used it to fulfil their obligations, others reported the plans in pdf format. The cut-off date for the WISE e-reporting was September 2023 and the MS were assessed based on the datasets available by this date.

By September 2023, Estonia submitted full electronic reporting and therefore the assessment is based on this dataset. Despite the cut off dates for the production of this report, reporting continued, and, for the State of Water report, the EEA aggregated the results available by July 2024 in their products and dashboards available at WISE Freshwater web portal.

Changes in Status, Pressures, Exemptions & Measures

Surface Water Bodies	Trend (% good status/potential)	Main Pressures & Changes & Exemptions
The total number of SWBs has slightly decreased since the 2nd RBMPs, from 752 to 746.		
ECOLOGICAL STATUS		The number of surveillance monitoring sites and operational monitoring sites has decreased by 19% and 46%, respectively. However, more quality elements are being monitored. The ecological status of Estonia's SWBs has deteriorated since 2nd RBMPs. No coastal waters reach good ecological status, and only 63% of SWBs are expected to be in good ecological status in 2027. Estonia applies exemptions under Article 4(4) to 39.8% of SWBs and under Article 4(5) to 6.6% of SWBs for ecological status.
CHEMICAL STATUS		In total, 14% of surface water bodies are monitored for chemical status. All 45 priority substances and all three matrices (water, biota, sediment) are included in the monitoring. The graph shows chemical status including uPBT substances. Since the 2nd RBMPs, no improvement is reported and 83% of SWBs remain in unknown status due to insufficient monitoring. No coastal water bodies reach good chemical status. In 2027, only 40% of SWBs are expected to be in good chemical status, with 50% remaining in unknown status, and 12% not achieving good status. Estonia applies exemptions under Article 4(4) to 5.6% of SWBs, and under Article 4(5) to 7% of SWBs for chemical status.

Ground Water Bodies	Trend (% good status/potential)	Main Pressures & Changes & Exemptions
The number of GWBs has slightly decreased from 39 to 31.		
QUANTITATIVE STATUS		80% of area of GWBs are monitored. The confidence in classification has improved significantly, reaching 80% of GWB assessed based on high confidence. Two GWBs (6.5%) fail to achieve good quantitative status. These two and two additional GWBs are at risk of not reaching good status by 2027. Estonia applies exemptions under Article 4(4) due to technical feasibility and article 4(5) to both GWBs. Additionally, exemption under Article 4(4) is applied due to natural condition to one GWB.
CHEMICAL STATUS		All groundwater bodies are monitored for chemical status, but the coverage of monitoring accounts 85% of groundwater area. 8 GWBs (26%) are in poor chemical status. While six of them are expected to be in good status by 2027, there are still 2 GWBs remaining in poor chemical status. In addition to these 8 GWBs, further 10 GWBs are at risk not being in good chemical status in 2027. Exemptions under Article 4(4) are applied to 17 GWBs and under Article 4(5) they are applied to two GWBs (6.5%).

2. Horizontal aspects

2.1 Governance

Estonia has multiple competent authorities in charge of the different aspects of the River Basin Management Plans (RBMPs), most of them at national levels. The number of authorities in charge of water management has risen from three to nine compared to the 2nd RBMPs. The coordination of the implementation is of the responsibility of the Ministry of Environment. The coordination of the implementation of the Water Framework Directive (WFD) and the Floods Directive (FD) as well as the Marine Strategy Framework Directive (MSFD) is crucial for a proper implementation of environmental objectives. To be noted that greater number of involved authorities ensures that various aspects and views are considered during the planning, if the coordination is well conducted.

In Estonia, all RBMPs include the objectives of both Directives (FD and MSFD). Particularly positive is the fact that the Estonian authorities reported that all RBMPs, Flood Risk Management Plans (FRMPs) and Programmes of Measures established under the MSFD were drawn up in parallel and they were synchronized. Also, public consultation actions were organised together so ensuring synergies between RBMPs, FRMPs and marine measures. This synergetic approach is very important to achieve the objectives of these directives. The consultation took place in several steps and lasted for six months.

As regards transboundary coordination, Estonia continues to have an international co-operation with Latvia, whereby there is an international agreement place. Cooperation with Russia traditionally occurred under the established Estonian-Russian Joint Commission on the protection and sustainable use of transboundary waters. Estonia is a contracting party of the Cooperation for the Protection of the Marine Environment of the Baltic Sea (HELCOM)[4] and the measures are linked to the Baltic Sea Action Plan 2021.

To be noted that the recently updated KOTKAS[5], an Estonian permit register and information system, supports automatic exchange of water data and real-time reporting, thus improving data quality and saving resources of authorities and creating a standardised data taxonomy for all sectors.

2.2 Characterization of River Basin District

Regarding the 2nd RBMPs, the Commission had encouraged Estonia to ensure that reference conditions are established for all relevant quality elements for all surface waters. It is positively noted that in the 3rd RBMPs, most of the reference conditions for biological quality elements have been intercalibrated. However, there is a gap in the intercalibration of reference conditions for fish fauna in very large rivers. Indeed, the 3rd RBMPs report that reference conditions have been established for all hydromorphological quality elements for all coastal water body types. However, gaps remain for some lakes for which reference conditions have not been established.

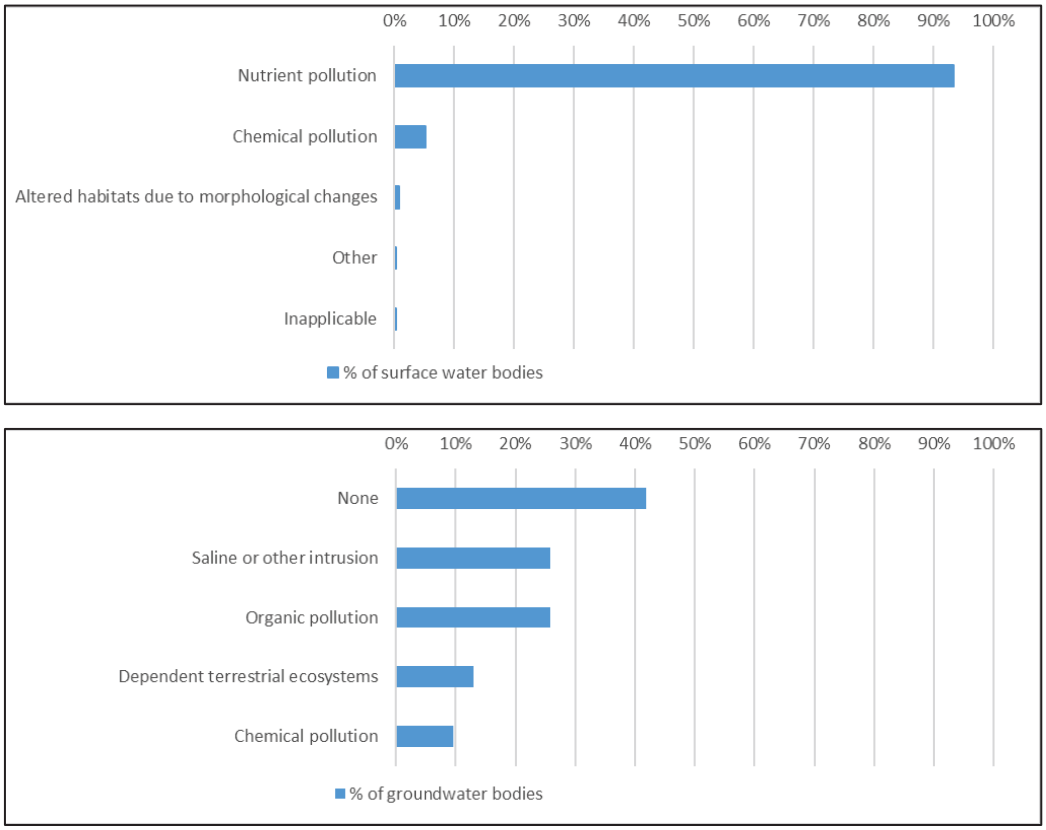
For the pressures, it is encouraging to note that the knowledge has improved; however, perhaps because many of the unknows have been cleared, Estonia indicates that the pressures on the ecological status of surface water bodies seem to be very high. Compared to the two other Baltic countries, Estonia seems to face less eutrophication problems but still it is worrying that many water bodies are failing due to nutrient conditions.

[4] Cooperation for the protection of the marine environment of the Baltic Sea: https://helcom.fi/
[5] Keskkonnaotsuste Infosüsteem: https://kotkas.envir.ee/

Surface waters

The most significant pressure identified is diffuse pollution which affects more than 90% of the water bodies. More precisely, the problem is nutrient pollution that affects 93% of the water bodies (Figure 1). While the unknown anthropogenic pressure was reported to affect the highest percentage of surface water bodies (approximately 70%) in the 2nd RBMPs, more information of diffuse and other pressures has removed the uncertainty of unknown pressures in the 3rd RBMPs (aligned to only 5 water bodies). The most significant impacts on surface waters are nutrients which have increased from 11% in the 2nd RBMPs to 94% in the 3rd RBMP. It is not clear if this change is due to better assessment of the pressure or due to more emissions. To note, the pressure of invasive alien species (IAS) on waters has not been assessed. While, in total, there are 9 aquatic species of EU concern in Estonia[6], no concrete measures are introduced to combat IAS.

Figure 1. The most significant impacts on surface water and groundwater bodies in Estonia in 3rd RBMPs (expressed as percentages of numbers of water bodies)

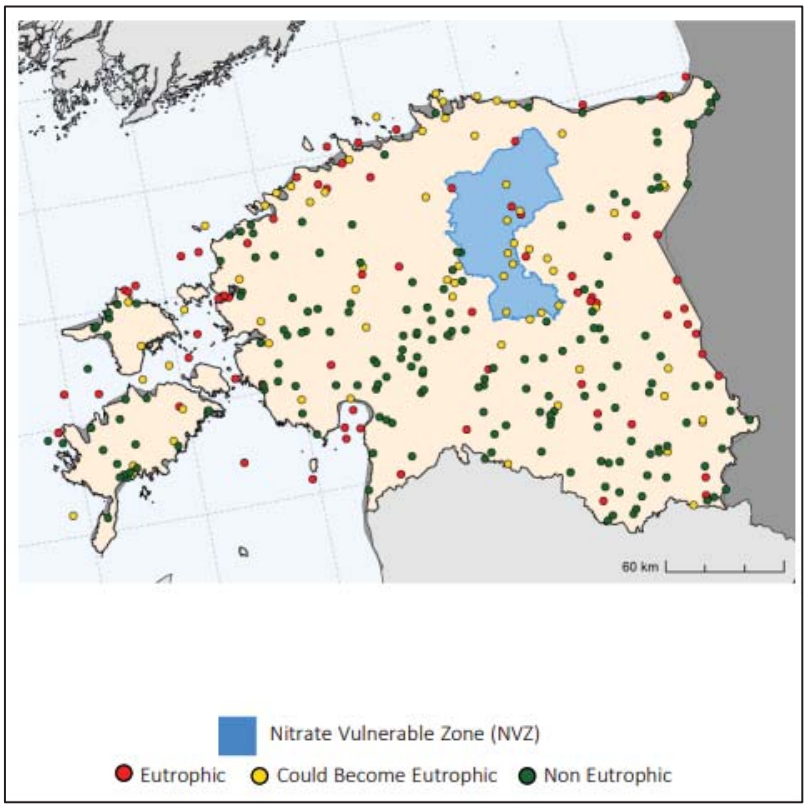


Source: WISE electronic reporting

The excess of nutrients discharged into the surface waters leads to eutrophication causing proliferation of algae blooms and oxygen depletion in both lakes and coastal waters. Under the Nitrates Directive reporting, Estonia indicated that many monitoring points across the country show surface waters as eutrophic or at risk of becoming eutrophic (Figure 2).

[6] EASIN - European Alien Species Information Network: https://easin.jrc.ec.europa.eu/easin/

Figure 2. Map of the monitoring points showing eutrophication assessment in Estonia, according to the reporting of the Nitrates Directive.[7]



Groundwaters

A clear evolution can be seen between the two cycles. Saline intrusion and organic pollution have been reported as the greatest impacts on the quality of groundwater with 26% for both types of impacts (Figure 1). Whereas in the 2nd RBMPs, the most significant pressures were unknown for most water bodies and chemical pollution for 22% of water bodies. It is worth noting that according to Estonian authorities, there are no significant pressure for 71% of groundwater bodies, but in the electronic reporting to the Commission, this percentage seems to be 42%. Contrary to surface waters, the percentage of groundwater bodies reported to be significantly impacted by chemical pollution has considerably decreased since the 2nd RBMPs (from 21% to 3%).

Estonia mentions the impact of oil shale mining, which is causing the deterioration of their groundwater bodies. These mining activities have a direct influence on groundwater quality due to the use of machinery, mining by-products becoming dissolved in the water, and minerals formed when the rock is exposed to air becoming dissolved in the water.[8] Subsequently, the sector abstracts large amounts of water both for the operation itself and for removal of groundwater to prevent flooding of the mine.

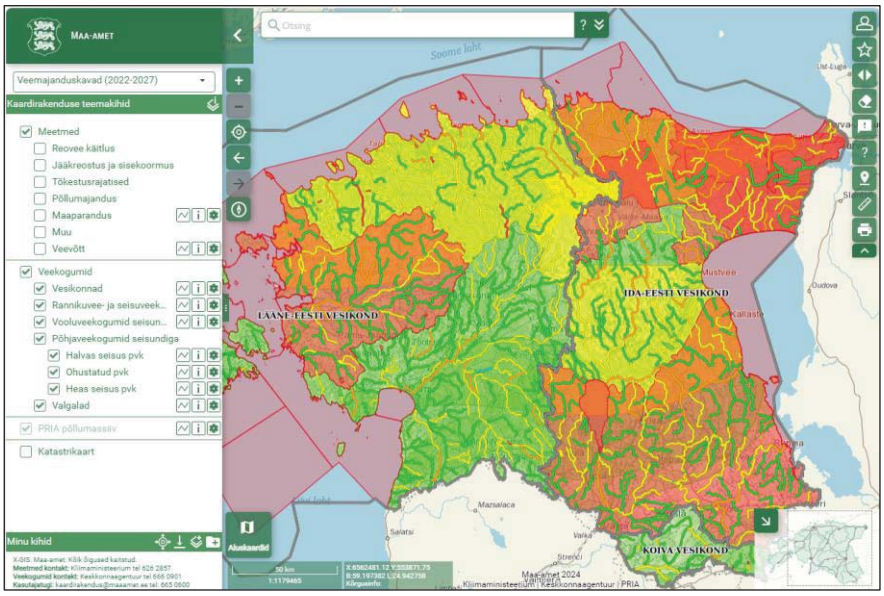
Estonia shares water information via a map service

NITRATES DIRECTIVE - Reporting Period 7 (2016-2019) – trophic status: https://water.jrc.ec.europa.eu/portal/apps/dashboards/cb6034c2a75e4df282f8a62f90c16caa

[8] A study on the EU oil shale industry – viewed in the light of the Estonian experience: https://easac.eu/fileadmin/PDF_s/reports_statements/Study.pdf

The Maa-amet geoportaal[9] is a map-based service providing an overall view of the status of water bodies. Figure 3 shows the screenshot of the service.

Figure 3. Maa-amet geoportaal provided by the Estonian Land Board (screenshot of the service).



Source: maa-amet geoportaal

3. Policy elements contributing to biodiversity and climate change adaptation

3.1 Surface Water: what is their ecological status or potential

Monitoring

There are two types of monitoring: i) operational monitoring to determine the status and which covers all water bodies at risk and ii) surveillance monitoring aimed rather at identifying impacts and long-term changes.. In Estonia, the number of surveillance monitoring sites has decreased by 19% compared to 2nd RBMPs and even more for the number of operational monitoring sites which have decreased by 46%. However, Estonia explains that operational monitoring programme is reviewed and re-planned yearly and therefore, the eventual number of sites is not yet available.

In the 3rd RBMPs, the surveillance monitoring is covering 48.2% of river length, 100% of lake area, 0% of coastal area. Whereas operational monitoring is covering 2.1% of river length, 0% of lake area, and 100% of coastal area. Estonia explains that surveillance monitoring needs are mapped and planned with operational monitoring plan for each year taking into account information gathered with surveillance monitoring and implemented measures.

It is positive that more quality elements are being monitored and used for classification than in the 2nd RBMPs. However, hydromorphological quality elements are monitored only in lakes and rivers, but not in coastal waters. As regarding gaps in the monitoring, for rivers, there is no thermal, or salinity conditions monitored, for lakes, no thermal, oxygenation, or salinity conditions monitored, and for

[9] Maa-amet geoportal: https://xgis.maaamet.ee/xgis2/page/app/kem_veemajanduskava

coastal waters, no tidal regime, thermal oxygenation, nor salinity conditions being monitored. Thus, it appears that the implementation of monitoring and classification is still not complete.

It is important to highlight that while Estonia is monitoring river basin specific pollutants (RBSPs) in all water body types, only 15% of (115) surface water bodies are assessed using RBSP monitoring. More effort in increasing RBSP monitoring of lakes and coastal waters seems to emerge compared to rivers. An improvement can be seen also for the territorial water which is now monitored for RBSPs.

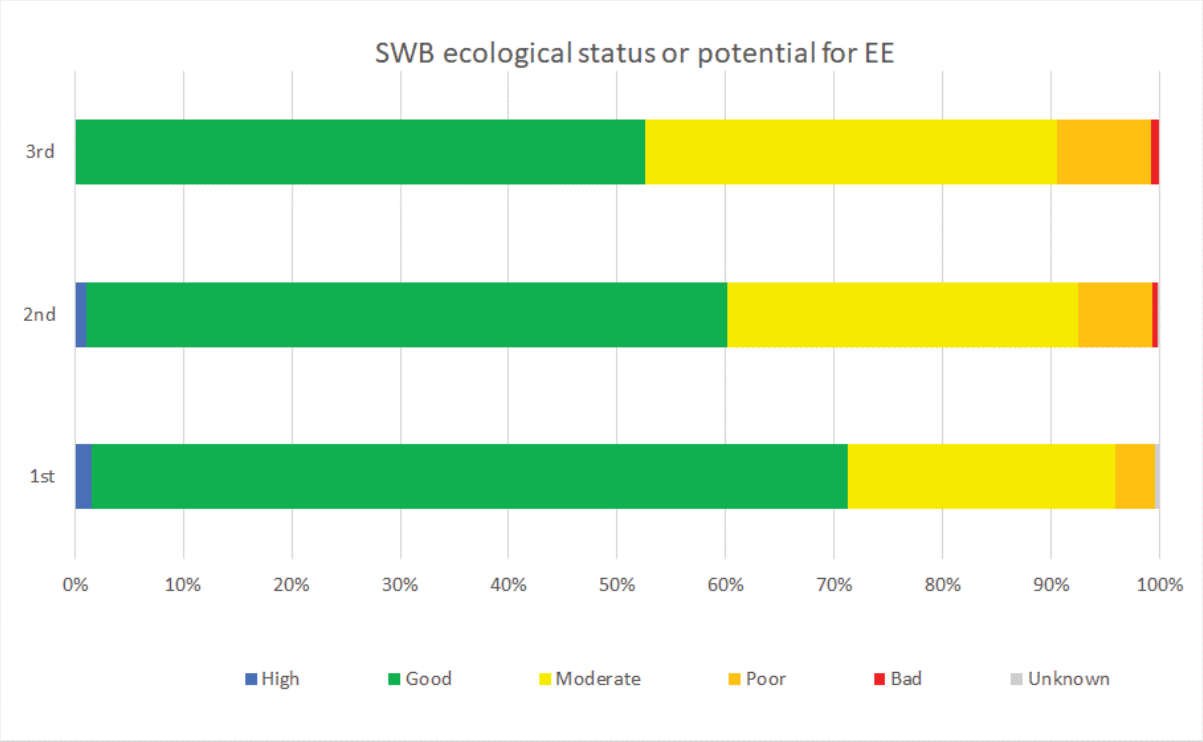
Status assessment

The assessment of the ecological status is based on at least one biological quality element for 457 (61%) surface water bodies while 4 water bodies are assessed based on expert judgement or modelling. For the rest 289 water bodies, no biological quality elements are used and they are classified based on mainly physico-chemical quality elements. Compared to the 2nd RBMPs, the use of biological monitoring for status assessment has increased from 401 (2nd RBMPs) to 457 (3rd RBMPs) water bodies.

Regrettably, the ecological status or potential of the surface water bodies has continuously been deteriorating from 70% (1st RBMPs) to 60% (2nd RBMPs) and 53% (3rd RBMPs) in good ecological status or potential. Furthermore, there are no more water bodies in high ecological status. Figure 4 shows the evolution along the different planning cycles. This trend can, at least partly, be explained by the fact that the knowledge on the status of the water bodies has considerably increased in Estonia. However, it does not close the possible deterioration of the status.

The confidence in the classification has not improved, in fact, the proportion of water bodies classified based on unknown confidence has drastically increased. Against this background, Estonia expects that only 70% of the water bodies will be in good status by 2027.

Figure 4. Ecological status or potential of surface water bodies (SWBs) in Estonia in the 1st, 2nd, and 3rd RBMPs.



Source: WISE electronic reporting

3.2 Hydromorphological changes and artificialization (HMWBs and AWBs)

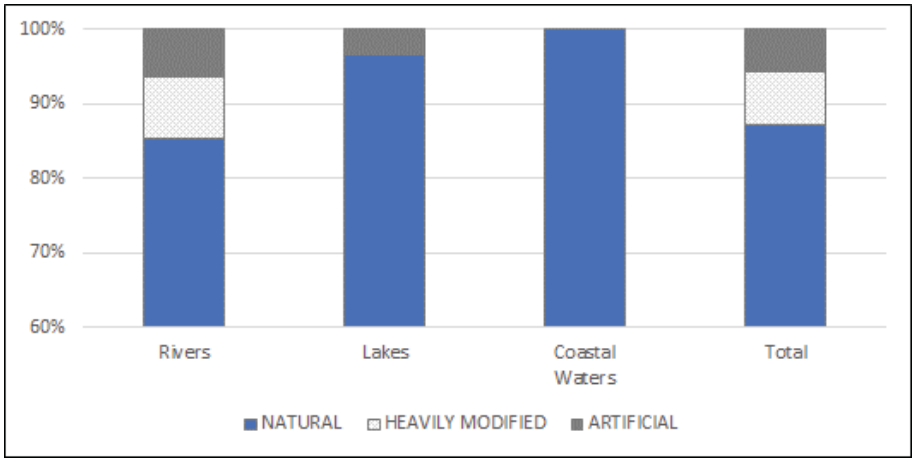
Hydromorphological characteristics of surface water bodies concern the quantity and dynamics of water flow, the connection of surface water bodies to groundwater bodies, continuity of rivers, as well as river depth, river width and their variation in structure as well as the substrate of the riverbed structure of the riparian zone.

Overall, 8.3% of total river water bodies in the 3rd RBMP are designated as heavily modified, and 6.3% of river water bodies and 3.2% of lake water bodies as artificial (Figure 5). The number of heavily modified river water bodies has slightly decreased since the 2nd RBMPs, from 56 to 53 water bodies. While in the 2nd RBMPs, one coastal water body had been designated as heavily modified, in the 3rd RBMPs there are none.

The changes are due to new information from monitoring and research, and new delineation of water bodies. One change in the designation was due to the removal of a barrier. The reason for designating water bodies as heavily modified is land reclamation (affecting 81% of HMWBs), barriers (affecting 40% of HMWBs) and periodic anthropogenic water shortages (affecting 37% of HMWBs). In 2019, an interim assessment of the status of water bodies found that there were 132 water bodies not in good or high ecological status due to barriers.

According to the status assessment, two heavily modified water bodies are in good, 31 in moderate, 17 in poor and three in bad ecological potential. For artificial water bodies, 35 are in good, three in moderate and two in poor ecological potential. The methodology for assessment of good ecological potential (GEP) is ongoing and not yet completed in Estonia, and in the RBMPs, the same class boundaries are used for natural waters. Habitat types of aquatic biota, among others, are not considered in GEP assessment, which indicates an important gap.

Figure 5. The proportion of natural, heavily modified, and artificial water bodies by water category and total.



Source: WISE electronic reporting

3.3 Groundwater bodies - have they sufficient water – quantitative status

Monitoring

The number of groundwater bodies in Estonia was decreased from 39 (2nd RBMPs) to 31 (3rd RBMPs), due to re-delineation, but the total groundwater body area did not change. To be noted that a joint

monitoring programme for Estonia and Latvia has been established through an Interreg project in 2018-2020[10]. However, Estonia reported no transboundary groundwater bodies.

There has been a slight increase in monitoring sites for quantitative monitoring from 243 (2nd RBMPs) to 256 (3rd RBMPs). Grouping of groundwater bodies is not used in the assessment of the quantitative status of groundwater bodies so that currently 100% of Estonia's groundwater bodies in terms of number are subject to quantitative monitoring; however, monitoring is not covering the total area of groundwaters (80.3% of coverage)[11].

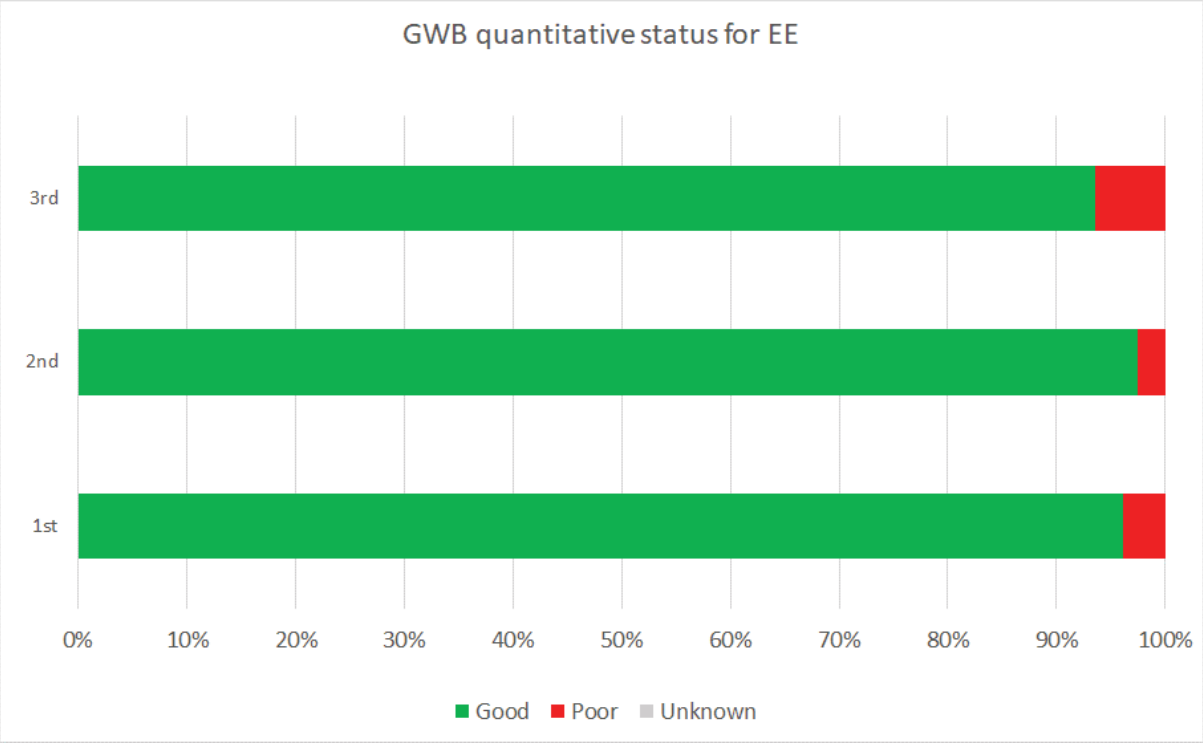
Status assessment

It has been reported that two groundwater bodies (6.5% of total groundwater bodies) are assessed in poor quantitative status (Figure 6), and Estonia estimates that they will remain in poor status by 2027. Two further groundwater bodies are at risk of failing to remain in good quantitative status by 2027. 80.6% of the classifications conducted are of high confidence and this indicates a notable improvement compared to the 2nd RBMPs which had a high level of confidence for only 5.1% of groundwater bodies.

Two groundwater bodies, which are currently at good status, are at the same time at risk of failing good quantitative status by 2027 because of ecological decrease in associated surface waters, distortion of the water balance, and lowering of water table. Furthermore, water abstraction is seen as one of the pressures on groundwaters in Estonia. In 2016-2021, the average annual abstraction from groundwater amounted up to 228 million cubic metres, from which the majority because of mining and quarrying[12].

[10] Interreg project 'Water bodies without borders': https://wbwb.eu/
[11] Data derived from WISE electronic reporting. According to the Estonian authorities, the coverage of quantitative monitoring is 100%.
[12] Eurostat - Annual freshwater abstraction by source and sector (not considering leakages or evaporation from the surfaces of reservoirs and canals after abstraction): https://ec.europa.eu/eurostat/databrowser/bookmark/82866331-d833-482a-96c6-a09d5d06a2d4?lang=en

Figure 6. Quantitative status of groundwater bodies (GWBs) in Estonia in the 1st, 2nd, and 3rd RBMPs.



Source: WISE electronic reporting

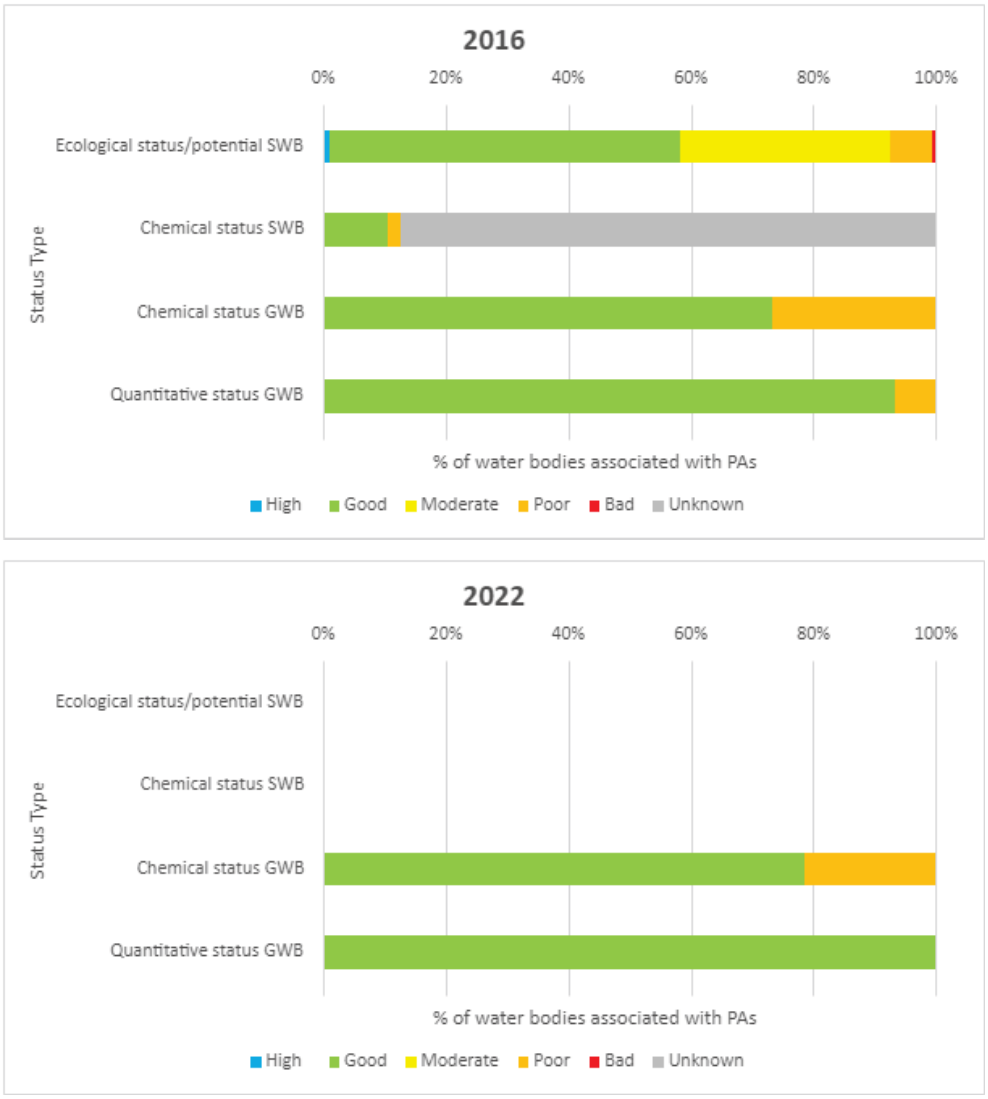
3.4 Protected Areas (identification, monitoring, objectives and measures)

A large proportion of Estonian's territory has been nationally designated under protection. In fact, protected water areas (746 for surface waters and 14 for groundwaters) have been identified for all relevant Directives in the 3rd RBMPs: Nitrates Directive, Birds and Habitats Directives, Bathing Water Directive, Urban Waste Water Treatment Directive. The only designated nitrate vulnerable zone is located in the north-central part of Estonia. Sensitive areas have been designated under the Urban Waste Water Treatment Directive, as well, given that national legislation (Water Act) requires all river basins with wastewater treatment plants to be designated as sensitive. Furthermore, no areas have been identified for the protection of economically significant aquatic species.

Figure 6 indicates the progress in the status of water bodies associated with protected areas in the 2nd RBMPs and 3rd RBMPs.[13] It is encouraging that the status of groundwater bodies associated with protected areas has improved since the 2nd RBMPs for both quantitative and chemical status.

[13] It should be noted that there was a technical problem during electronic reporting (confirmed by the Estonian authorities). The information assessed has been limited which affects the overview picture of protected areas in Estonia and the estimation of progress made compared to the 2nd RBMPs.

Figure 7. Progress in the status of water bodies associated with protected areas in the 2nd RBMPs (2016) and 3rd RBMPs (2022).



Note: Due to electronic reporting difficulties, the status of surface water bodies associated with protected areas are not shown for the 3rd RBMPs (2022)

Source: WISE electronic reporting

By 2022, 27.2% of the Estonian territorial sea has been under protection. HELCOM updated its Baltic Sea Action Plan in 2021, a strategic programme of measures and actions for a healthy Baltic Sea. The plan has also been part of the programme of measures reported under the MSFD which has been assessed in parallel.

3.5 What is being done to prevent/reduce hydromorphological pressures

In Estonian RBMPs, restoration and mitigation measures have been planned, such as removal of barriers, construction of fish ladders, reviewing of permit conditions to address hydromorphological alterations, land reclamation in terms of restoring river continuity etc. Estonia has spent millions of euros to reconnect its rivers, with financial support from the EU. Estonia has also in place a register of physical modifications of water bodies, so that better information (and control) of existing hydromorphological pressures to be allowed. Moreover, a study of the impact of the dams on aquatic

environment is planned in the programme of measures aiming to fill knowledge gaps and to set the conditions for and monitoring of the minimum ecological flow. Estonia intends to implement ecological flows for all relevant water bodies by 2027. It is encouraging that the number of implemented hydromorphological measures has increased during the past six-year period. However, in Estonian RBMPs, there is no clear explanation whether and how nature-based solutions are prioritised for planning. The only mention is that measures for improving natural water retention has been implemented in 20 water bodies, four in the Eastern RBD and the rest in the Western RBD

The contribution of Estonia to river restoration by removing dams is showing good development. One example is the removal of the Sindi Dam in the Pärnu River, which is demolished in 2018-2019 and the restoration work was remunerated with the Natura 2000 Award[14]. Estonia is diversifying its energy mix in particular via pumped storage hydropower. In fact, such a plant with a total capacity of 550 MW will be constructed starting in 2025[15].

In coastal waters, measures related to hydrographical changes are adequately linked to the programme of measures under the MSFD.

3.6 What Estonia is doing for abstractions and water scarcity

As water scarcity is an issue of global concern, this is not the case with Estonia where water sources are not under stress. However, the estimation of the annual Water Exploitation Index Plus (WEI+) for 2007-2019 varies between 2.4 and 21[16], while water scarcity is generally considered to occur when the ratio of water abstraction to long-term average available water resources exceeds 20. It is also worrying that contrary to the 2nd RBMPs, in which water abstraction did not constitute a significant pressure factor on surface waters in Estonia, in 3rd RBMPs water abstraction is identified as a significant pressure factor for both rivers and lakes, i.e., affecting 5.4% of total river water bodies and 2% of total lake water bodies.

Regarding groundwaters, currently, two water bodies are at risk to fail good quantitative status in 2027, influenced primarily by water abstraction for the public water supply network and for mining activities. The 3rd RBMPs include clear measures to address significant pressure from water abstraction in those groundwater bodies assessed in poor quantitative status and those surface water bodies assessed in less than good ecological status / potential. But anticipated effectiveness of measures cannot be estimated since no information has been provided on the gap to achieve the objectives in 2027.

Having a closer look on Estonia's legal regime laying down basic principles for water abstractions, it was found that water abstraction exceeding certain thresholds requires a permit, i.e., a water permit or an integrated permit according to Estonian Water Act. In Estonia, permit requirements are reviewed during regular inspections of integrated permits, including those necessary to comply with Article 11(5) WFD, but according to the Estonian law integrated permits and water permits are generally issued for unlimited period, which raises some doubts whether there is in place systematic control mechanism for permits.

[14] Natura 2000 Award - Improving the Pärnu river basin for its migratory fish: https://environment.ec.europa.eu/topics/nature-and-biodiversity/natura-2000-award/meet-natura-2000-heroes/improving-parnu-river-basin-its-migratory-fish_en

[15] A bulletin by the energy company Zero Terrain/Energiasalv: https://zeroterrain.com/estonias-first-pumped-hydro-energy-storage-project-zero-terrain-partners-with-the-estonian-government-and-receives-a-grant-of-e19m/

[16] Water exploitation index, plus (WEI+) from 2009 to 2019: https://ec.europa.eu/eurostat/databrowser/bookmark/8e6c6e33-3a7c-4c9a-b6c7-11710a1fbba0?lang=en

3.7 Adaptation to climate change

Estonia acknowledges the impact of climate change on drought as a possible risk in the near future. While climate change adaptation measures are mentioned in all three Estonian RBMPs, they do not report any surface water bodies or groundwater bodies having failed to reach good status based on climate change. Thus, no adaptation measures have been identified. In its national Climate Change Adaptation Development Plan[17], Estonia is setting up basic measures such as identifying more effective water reuse options, investigating important water management issues, and assessing the relevant socio-economic impacts. No Drought Management Plan has been developed. It is notable though that Estonia is pioneering in exploring more sustainable farming practices such investing on research for drought-tolerant plants[18].

Flood management

The Floods Directive requires to consider the impacts of climate change on the occurrence of floods, and therefore in the preparation of Flood Hazard and Risk Maps (FHRMs) and Flood Risk Management Plans (FRMPs). More information on these can be found in Section B. However, considering the close relationship between overall water management and floods management and the importance of climate change on both, consideration climate change is jointly addressed in this section.

The first FHRMs reference studies on climate change impacts on floods, but this was done in the form of a literature review. No information on specific climate change related data were used in preparing the flood hazard maps. Since then, several studies and analyses have been published, based on which it was possible to more accurately assess the impact of climate change on the occurrence of floods and take this into account when preparing FHRMs, although Estonia concluded that the impact of climate change, even in 2100, is minimal.

The FRMPs have a separate chapter on climate change, giving an overview of climate change projections and their implications for floods. Additional data have been collected and updated forecasts have been made[19], and this is relatively more comprehensive in the second FRMPs. The FRMPs state that, as the impact of climate change on floods is not considered major, they do not have measures specifically to address the likelihood and potential adverse consequences of flooding related to climate change. Nonetheless, a climate sensitivity analysis[20] was carried out for all actions during the preparation of the Action Plan 2022-2027 (as was the case for the Action Plan 2015-21 of the first FRMP). Spatial planning and land use measures are generally categorised as having medium climate sensitivity, i.e. they should not be directly affected by climate change in most cases, although indirect effects may occur. In addition, one nature-based solution in the Action Plan 2022-2027 – to support water retention on agricultural lands – refers to agricultural land management practices that can support climate change adaptation and flood risk mitigation or prevention, such as buffer strips and permanent grasslands, as well as the restoration and maintenance of floodplain meadows that preserve space for high water. The Action Plan states that this will be implemented under Estonia's Common Agricultural Policy Strategic Plan.

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[17] Kliimamuutustega kohanemise arengukava aastani 2030: https://kliimaministeerium.ee/rohereform-kliima/kliimapoliitika/kliimamuutustega-kohanemine

[18] Breeding of drought-tolerant plants reduces food shortages: https://ut.ee/en/content/breeding-drought-tolerant-plants-reduces-food-shortages

[19] Estonian Environmental Agency, Estonian future climate scenarios to 2100', 2016, https://www.klab.ee/wp-content/uploads/sites/4/2016/04/2016-04-07-KAUR_Lopparuanne.pdf

[20] FRMP of West Estonia (EE1), pp. 30-33; FRMP of East Estonia (EE2), pp. 25-28; FRMP of Koiva (EE3), pp. 15-18.

4. Policy elements contributing to zero pollution

4.1 Surface Water: what is their chemical status

Monitoring

Estonia receives a low score in terms of monitoring its surface waters for chemical status both in 2nd and 3rd RBMPs as only 14% of all water bodies in Estonia are subject to monitoring (with 45 priority substances not all included) which in practice means that a great number of surface water bodies remains at unknown status. It must be noted that Estonia does not make use of grouping water bodies or modelling like many other Member States which entails a large number of water bodies in unknown chemical status.

The 3rd RBMPs discuss surveillance monitoring for all three matrices: water, biota, and sediment.

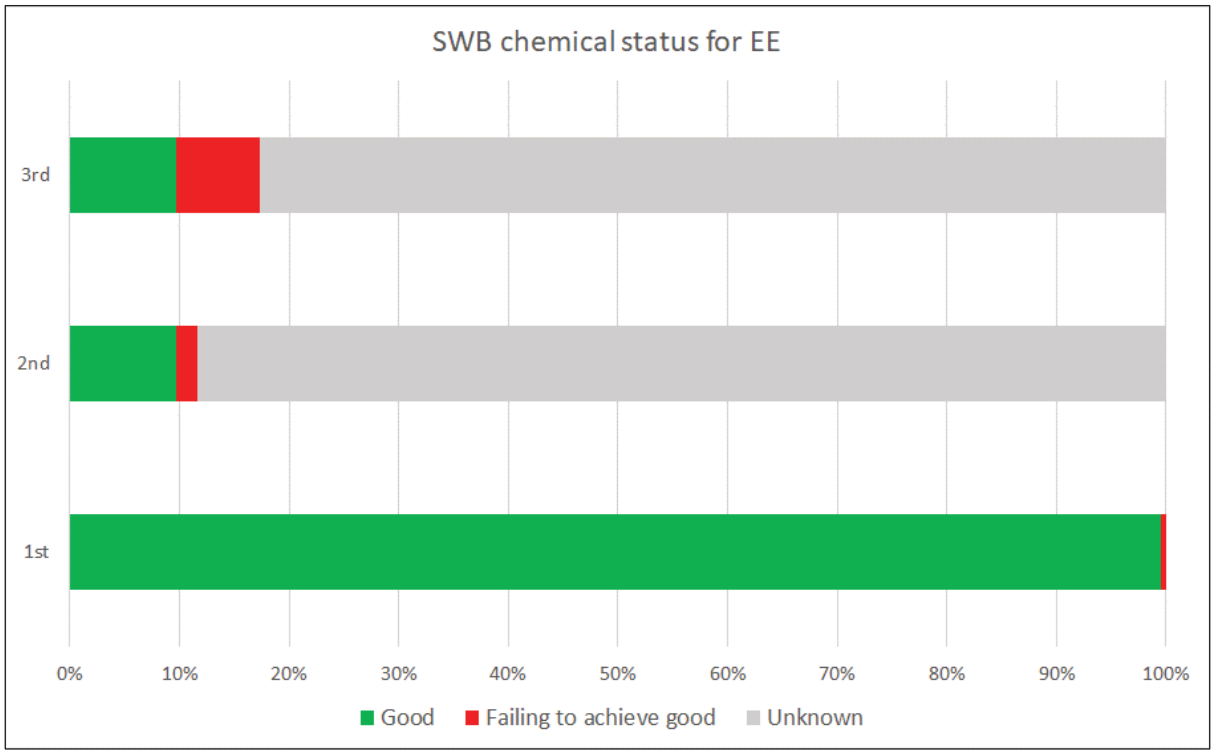
As regards monitoring frequency, the 3rd RBMPs state that surveillance monitoring occurs less frequently than the minimum set by the WFD, due to budgets and available resources.

The insufficient monitoring of surface water bodies provokes some uncertainty to what extent chemical pollution affects the Estonian surface water bodies.

Status assessment – Evolution of chemical status of surface water bodies since the 2nd RBMPs

As explained above, large proportion (83%) of the water bodies were not assessed for chemical status which is slightly lower than in the 2nd RBMPs (Figure 8). Out of the assessed water bodies, 9.7% (72 water bodies) are in good and 7.6% (57 water bodies) not achieving good chemical status. Without the uPBT substances, the percentages are 14.6% and 2.7%, respectively. None of the coastal and territorial waters are in good chemical status, while without the uPBT substances, all water bodies except one would be in good chemical status. The comparison to the 2nd RBMPs shows no significant change in good chemical status but a slightly higher percentage assessed as poor. Estonia is expecting that almost 74% of surface water bodies to be in good chemical status by 2027.

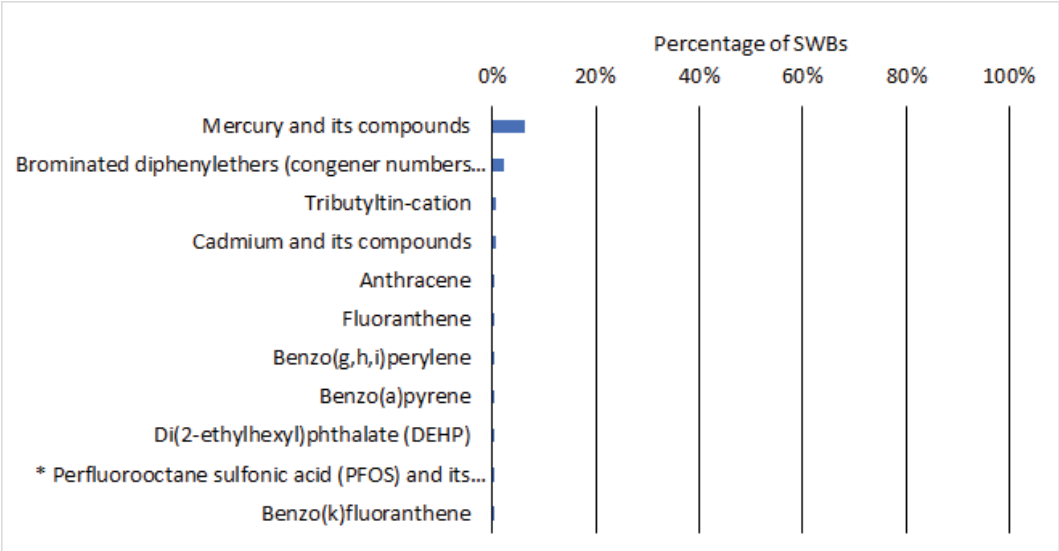
Figure 8. Chemical status of surface water bodies (SWBs) in Estonia in the 1st, 2nd, and 3rd RBMPs.



Source: WISE electronic reporting

The reason for failure in achieving good chemical status is mainly due to two specific priority substances (Figure 9): mercury and polybrominated diphenyl ethers (PBDEs). Both pose significant threat to humans and aquatic environment, and they belong to ubiquitous, persistent, bioaccumulative, and toxic (uPBT) substances. In the 2nd RBMPs, in addition to mercury, other metals (cadmium, lead, nickel) and two pesticides (cybutryne and dichlorvos) were causing failure.

Figure 9. The top-10 Priority Substances causing failure to achieve good chemical status in surface water bodies in Estonia with addition of one new priority substance.



Note: The new priority substance according to the 2008/105/EU as amended by 2013/39/EU[21] is marked with asterisk (*).

Source: WISE electronic reporting

To be noted that according to a survey published in February 2024, the Estonian Environmental Investment Centre, in cooperation with the police and border guard, found up to eight kilogrammes of mercury on one of underwater shipwrecks sunk during World War II[22].

4.2 Groundwater Bodies: what is their chemical status

Monitoring

All 31 groundwater bodies are monitored for chemical status with a coverage of 85% of groundwater area, which means that some groundwater bodies are only partially covered. Despite the decrease in the number of groundwater bodies, total groundwater body area has remained almost the same compared to the previous cycle. Estonia has decreased the number of monitoring sites from 394 to 353 for surveillance monitoring and increased them from 160 to 173 for operational monitoring. All substances causing risk of deterioration[23] of chemical status are subject to monitoring.

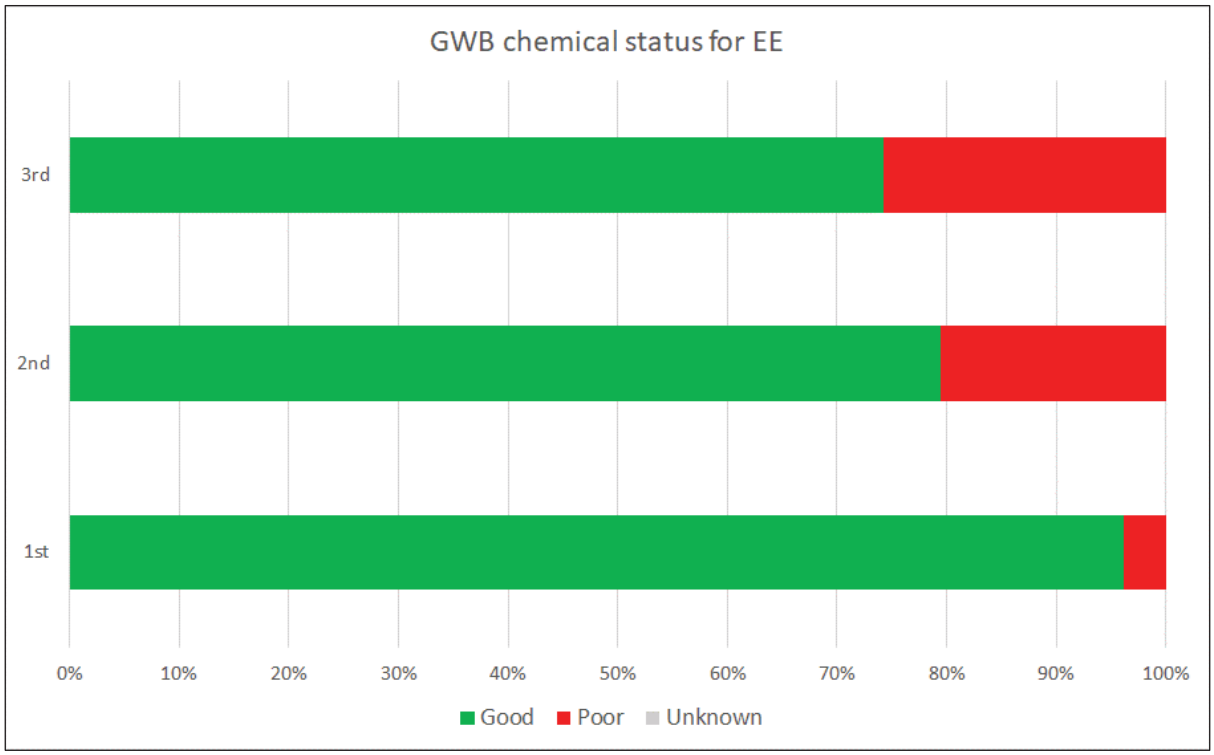
Status assessment

The assessment of groundwater bodies considers chemical substances, saline or other intrusions, impacts on drinking water protected areas and impacts on groundwater associated aquatic ecosystems (GWAAE) and on groundwater dependent terrestrial ecosystems (GWDTE). The confidence in the assessment has improved, having over 40% of water bodies classified with high confidence.

Compared to the 2nd RBMPs with 8 groundwater bodies in poor chemical status, in the 3rd RBMPs, the same number of groundwater bodies (25.8%[24]) are still in poor chemical status (Figure 10). By 2027, only 6 of these 8 groundwater bodies are expected to achieve good chemical status while two will remain in poor chemical status. In addition to the above mentioned 8 water bodies, further 10 groundwater bodies are at risk of failing to achieve good chemical status by 2027.

[21] Directive 2008/105/EC as amended by Directive 2013/39/EU added 12 new substances i.e. numbered 34 to 45 to the priority substance list. For the 3rd RBMP, Member States have only had the obligation to monitor them. Compliance with the Environmental Quality Standard values for these 12 new priority substances will be assessed in 2027.
[22] Environmental Investment Centre - Up to 8 kg of mercury discovered in a shipwreck located in Estonian waters: https://kik.ee/en/news/8-kg-mercury-discovered-shipwreck-located-estonian-waters-0
[23] Substances in GWD Annex I and Annex II (Part B) and core parameters in WFD Annex V section 2.4.2
[24] The proportion of the groundwater bodies in poor status is higher compared to the 2nd RBMPs because of different number of total groundwater bodies.

Figure 10. Chemical status of groundwater bodies (GWBs) in Estonia in the 1st, 2nd, and 3rd RBMPs.



Source: WISE electronic reporting

Most of the failure in status is due to significant impairment caused by human activities, like mining of oil shale, industry and agriculture and significant environmental risk from pollutants across the groundwater body. Other reasons reported are the negative impact on the ecology of associated surface waters, the deterioration of water quality in drinking water protected areas and saline or other intrusion which might be linked to overabstraction of groundwater bodies adjacent to the coast. The pollutants or their indicators posing risks to GWBs are chemical oxygen demand (COD), ammonium, mono-basic phenols, aminomethylphosphonic acid (AMPA, a metabolite from glyphosate) and sulphate. In fact, ammonium concentrations together with COD and chloride are showing an increasing trend. The increasing chloride concentration is probably related to salinity intrusion caused by overabstraction. As regards nitrates, the trend is unclear, because provided data in relation to nitrogen and phosphorus balance in agricultural land from Estonian official statistics website refer back to 2012. EEA's data reported under the Nitrates Directive show that nitrate concentrations in Estonian groundwater for the period 2016-2019 exceed the maximum allowable concentration (50 mg NO3/l) in around 3% of monitoring stations[25].

Given that the greatest share of ammonium emissions is a result of chemical fertilizer used in agriculture, the increasing trend indicates that that Estonia's programme of measures for agricultural pollution after the 2nd RBMPs was still not effective as regards nitrogen pollution. It is also notable that Estonia reported in the 3rd RBMPs that 26% of groundwater bodies are affected by organic pollution, while in the 2nd RBMPs it was not mentioned as a significant impact.

[25] EEA – Nitrate in groundwater (published Oct 2023): https://www.eea.europa.eu/en/analysis/indicators/nitrate-in-groundwater-8th-eap

4.3 What Estonia is doing to combat pollution from agriculture

The primary sector (agriculture, forestry and fishing) accounts for around 2.5% of Estonia's total gross value added (GVA)[26], more than the EU average. Forests cover around 50% and agricultural land almost 25% of Estonia's territory. The average size of agricultural area per holding is one of the three biggest in Europe: in 2020 the average size in Estonia was 86 hectares of agricultural area per holding[27] while the EU average is only 17.4 hectares[28]. Around 23% of agricultural land is managed organically[29]. The share of the organic agricultural land and productivity has been increasing for 63% over the last decade[30]. In the Estonian CAP Strategic Plan for 2023-2027, the 23% area receiving support for organic agriculture is maintained[31]. Moreover, support is programmed to manage more than 70 000 hectares of pastures and meadows to preserve and enhance their natural and cultural environmental value.

The Water Act (2019) is one of the main legal acts on which the central measures of the programmes of measures 2015-2021 of the Estonian RBMPs are based on. The programmes of measures state that the current resources for inspection and enforcement of measures to tackle agricultural pressures are not sufficient. Furthermore, it should be noted that there is no specific assessment of achievements since the 2nd RBMPs and of the expected effects of the measures in the 3rd RBMPs either. No reference to the measures under the MSFD has been made and the assessment of the programme of measures addressing eutrophication under the MSFD is considered not adequate with several areas for room of improvement.

4.4 What Estonia is doing to combat pollution from other sectors

As regards tackling pollution from non-agricultural sources such as urban and industrial discharges and mining of oil shale, the available information does not allow for detailed assessment. Pollution from mercury, cadmium, lead, nickel, PBDEs, PFOS, and PAH etc was identified as important due to emissions from point sources, with the two most wide-spread substances mercury and PBDEs. Estonia reported measures to reduce the pressure on the chemical status, such as 'Compliance with the restrictions on discharge of pollutants, including hazardous substances, into the water' and 'Reducing and limiting the release of hazardous substances into water by means of permit'. However, in Estonian RBMPs there is no information about effectivity or how the proposed measures will reduce the pollution.

It is welcomed though that in the 3rd RBMPs, there are plenty of measures related to the control of urban wastewater pollution and wastewater pollution in sparsely populated areas, such as further treatment of current urban wastewater of agglomerations below 2000 person equivalents and establishment of water supply and sewage systems in sparsely populated areas. It is notable that a

[26] Estonia – CAP Strategic Plan – Overview: https://agriculture.ec.europa.eu/cap-my-country/cap-strategic-plans/estonia_en
[27] Analytical Factsheet - Estonia - Ten objectives for a future Common Agricultural Policy (CAP): https://agridata.ec.europa.eu/extensions/CountryFactsheets/CountryFactsheets.html?memberstate=Estonia#SO2-6
[28] Eurostat – Farms and farmland in the European Union – statistics: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Farms_and_farmland_in_the_European_Union_-_statistics#The_evolution_of_farms_and_farmland_between_2005_and_2020
[29] Eurostat - Developments in organic farming in 2021: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Developments_in_organic_farming
[30] Agrifood statistics – Increasing the share of organic farming: https://agridata.ec.europa.eu/extensions/CountryFactsheets/CountryFactsheets.html?memberstate=Estonia#SO6-4
[31] Mapping and analysis of CAP strategic plans (2023-2027): https://agriculture.ec.europa.eu/common-agricultural-policy/cap-overview/cmef/regulation-and-simplification/mapping-and-analysis-cap-strategic-plans_en

great number of planned measures includes administrative actions, for example better control of compliance with permits and knowledge improvement actions. Similarly to above, the link to MSFD programme of measures is not made and the measures reported under that Directive are inadequate.

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

In total, 182 measures were introduced in Estonia: 122 basic measures, 57 supplementary measures and 3 both basic and supplementary measures. All of them are linked to a specific Key Type of Measures (KTM). However, similarly to the 2nd RBMPs, no information has been provided on the expected gap to good status in 2021 or 2027. On the other hand, quantitative cost-effectiveness analysis has been carried out for technical measures in all three RBDs. The programme of measures states that the cost for basic measures is almost EUR 152 million and for supplementary measures, it is almost EUR 702 million. Most of the measures (90% of supplementary and 74% of all measures) are allocated to agricultural producers with a total cost of EUR 632 million.

In the 3rd RBMPs, Estonia has mapped measures to reduce mercury and other priority substances in surface water bodies, such as PBDE and Cadmium in fish; anthracene, TBT, Lead, and Cadmium in sediment; cybutrin, Lead, dichlorophos, fluoranthene, benzo(a)pyrene, benzo(g,h,i)perylene, PFOS, PAH, Mercury, and Nickel in water.

Furthermore, Estonia reported that a pan-Estonian survey of mercury deposition from air emission sources into the water environment has been planned to be undertaken. The aim is to develop suitable management to limit the impact of mercury deposition on surface water and to develop solutions to prevent and limit emissions from local sources of mercury.

The Baltic Sea has been one of the areas with most intensive international cooperation in terms of environmental protection and various policies are being implemented to protect the Baltic Sea and achieve its good status before the WFD and the MSFD took place, such as the Convention on the Protection of the Marine Environment of the Baltic Sea Area (HELCOM). There are many pressures affecting the Baltic Sea and they accelerate biodiversity loss, which leads to severe socio-economic consequences, for instance for tourism and fishing. The trends in dissolved inorganic nitrogen (and orthophosphate concentrations) in transitional, coastal and marine waters in Europe, for the period 1980-2021, are increasing in Estonia and that eutrophication remains a large-scale problem in the Baltic Sea[32]. The assessment of the MSFD programme of measures show low adequacy of Estonia's measures in the areas of nutrient pollution and contaminants.

So far, Estonia seems not to have been able to reduce its chemical pressures.

5. Exemptions and economics

5.1 To what extent are exemptions applied in Estonia

As the good status has not been achieved in all water bodies, Estonia has applied a significant number of exemptions under WFD Article 4(4) and Article 4(5) in the 3rd RBMPs. Article 4(6) and 4(7) exemptions were not applied. It seems that new projects were considered as part of water use

[32] EEA - Nutrients in transitional, coastal and marine waters in Europe (published Jan 2024): https://www.eea.europa.eu/data-and-maps/figures/trends-in-dissolved-inorganic-nitrogen-3

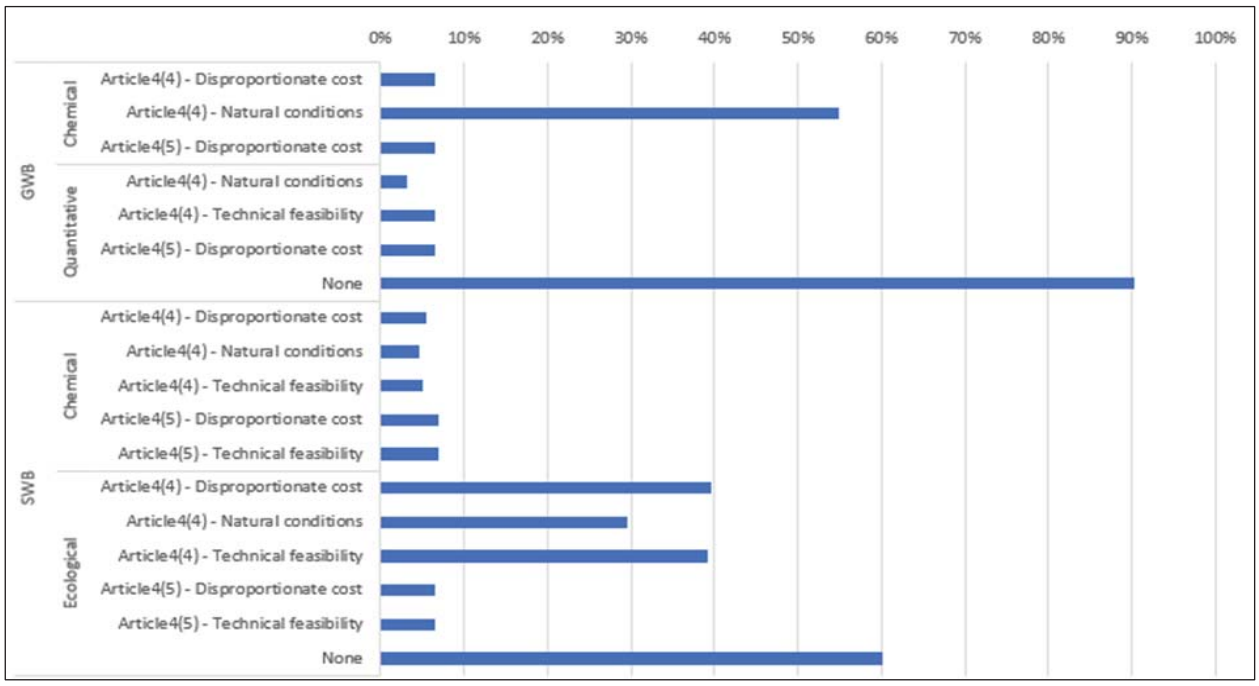
permitting or integrated environmental permitting procedures, without however any express reference to the application of Article 4(7) in the RBMPs.

Figure 11 shows the use of exemptions under Article 4(4) and 4(5) in Estonia, based on electronic reporting.[33]

According to electronic reporting, Article 4(4) exemptions for groundwater quantitative status have been applied to both groundwater bodies (6.5%) which are in poor status increasing from zero in the 2nd RBMPs and to 17 groundwater bodies for chemical status (54.8%). Article 4(4) exemptions for surface water ecological status / potential have been applied to 297 water bodies (39.8%) increasing from 252 water bodies in the 2nd RBMPs (33%)[34]. For chemical status, only 42 water bodies (5.6%) have been exempted in the 3rd RBMPs. In the 2nd RBMPs, the number of water bodies was low, too.

Regarding chemical status of groundwaters, Article 4(4) exemptions should be applied only for water bodies which are not in good status. In the case of Estonia, there are 8 groundwater bodies not in good chemical status, but contradictorily, the exemption for chemical status applies to greater number (i.e. 17 GWBs). This discrepancy might be linked to the fact that in addition to the 8 water bodies in poor status, there are further 10 water bodies in risk of failing to achieve good status by 2027.

Figure 11. The use of exemptions according to Art. 4(4) and 4(5) WFD in surface water bodies (SWBs) and groundwater bodies (GWBs) in Estonia. The figure shows the proportion of water bodies for each type of exemptions.



Source: WISE electronic reporting

According to electronic reporting, Article 4(5) exemptions have been applied to 49 surface water bodies (6.6%) for ecological status, increasing from one water body since the 2nd RBMPs, and 51 surface water bodies (6,8%) for chemical status as well as to two groundwater bodies (6.5%) for

[33] According to the Estonian authorities, there has been an error in the electronic reporting and the numbers slightly differ from the numbers in the RBMPs and their PoMs.

[34] It should be noted that the number of surface water bodies in Estonia has changed between the 2nd and 3rd RBMPs preventing a direct comparison of the application of Article 4(4) between the planning cycles.

chemical and quantitative status. To be noted that no Article 4(5) was applied to groundwaters in the 2nd RBMPs.

No exemptions according to Article 6(3) of the Groundwater Directive (GWD) have been reported as part of the electronic reporting. However, the 3rd RBMPs report one groundwater body to be exempted in accordance with Article 6(3) GWD. An inventory has been established of exemptions from the prohibition of direct discharges of pollutants into groundwater.

Regarding justifications for applying exemptions under Article 4(4), it can be seen that technical feasibility, disproportionate costs and/or natural conditions are used as an argument. Article 4(5) has been applied on the grounds of technical feasibility and disproportionate costs for surface water bodies and on the grounds of disproportionate costs for groundwater bodies with information provided at the water body level. Furthermore, it should be noted that Estonia developed a methodology to set criteria for justifying exemptions (Annex 10 to RBMPs) for both Article 4(4) and Article 4(5) exemptions.

5.2 Use of economic analysis and water pricing – cost recovery

Estonia identifies abstraction, damming, storage, drinking water supply and sanitation, and discharge of treated effluent as water services. An economic analysis has been carried out for measures related to urban areas, contaminated sites, agriculture, industry (electricity production, mining, food, other), public water supply, aquaculture, and hydromorphological restoration. The 3rd RBMPs do not provide a comprehensive report on the economic analysis as requested by WFD Annex III and neither do they provide a summary about what has been updated compared to previous economic analysis. However, the Estonian authorities indicate that numeric data has been updated compared to the 2nd RBMPs.

As the update appears to be based on a dataset with only observations of the recent past (2014 – 2018) and no forecasts for later years, it appears that the economic analysis does not have the long-term perspective as foreseen in WFD Annex III, to begin with the "long term forecasts of supply and demand for water." In this way, it remains unclear how the economic analysis has made use of the long-term climate scenario assessments underpinning Estonia's national Climate Change Adaptation Plan[35], if at all. The limited period of observation appears to be the reason as well for the absence of reporting estimates of the volume, prices and costs associated with water services in the next implementation period and beyond.

The Programme of Measures lists the measures together with their estimated costs, but without an explicit link to the economic analysis. It remains therefore unclear how the reported largely qualitative cost-effectiveness assessment make judgements about the most cost-effective combination of measures on a few sets of technical measures (measures on hydromorphological and sediment pressures, supplementary measures in the agricultural sector, and abatement measure targeting residual pollution). More generally, it is not clear whether for a larger set of measures, including investments, cost-effectiveness analysis has been used as a screening and selection tool, similar to the climate proofing instrument that reportedly has prioritised measures based on their flexibility and adaptability in the face of climate change impacts.

The gaps in the economic analysis, as regards the long term and cost effectiveness, render the investment planning unclear as well as the related choices on their financing and cost recovery. This matters as Estonia's investments in expanding and upgrading the capacity in the water sector received substantial financial support from EU Funds. The Estonian national and EU funding for water

[35] National Energy and Climate Plan: https://kliimaministeerium.ee/en/national-energy-and-climate-plan

infrastructure in 2014-2023 has been in total EUR 77.2 million and EUR 133.4 million[36], respectively. The finance options for new investments (and hence the investments themselves) partly depend on the share of the related capital costs recovered over time from the water services' users.

The RBMP reports that in the 2014-2018 period, a financial cost recovery rate of 86.2 % for the collective water supply and sanitation services combined over entire Estonia. There does not appear a disaggregation into recovery rates for individual water services and / or water user sectors, such as households, industry and agriculture. Unfortunately, the RBMPs do not clearly explain which revenues have been taken on board in the calculations, and how the financial support and depreciation / capital costs have been accounted for. This calculation is not followed by an economic analysis exploring the evolution of the cost recovery in the next programming period, and how this relates to policy choices as regards water pricing and the investment and finance planning over the longer term (such as whether to include depreciation over time for the investment part financed with grants).

The RBMPs lack an explicit account as to whether the water pricing policies provide adequate incentives for an efficient use of water; whether the various water user sectors and water uses give an adequate contribution to the water services' costs; and which grounds have been used to justify less than full cost recovery.

The reported information on actual prices (the average tariff for collective water supply and sanitation services) is not enough to assess the extent of incentives, but the qualitative information on pricing suggests some incentives. It concerns the overall high cost recovery rate and the tariff differentiation across regions suggest such incentives. Also, the design of the water pollution charges seems focussed on incentivising abatement, since polluters get a rebate on this charge if their discharges remain below concentrations limits stated in their permits. However, the RBMPs mention that affordability concerns have informed water tariffs for households, but without information on the extent that these adaptations focus vulnerable and / or poor households, it is not clear how much the price incentives have been dented overall.

The application of the polluter pays principle in the cost recovery is corroborated with a general reference to the costing and pricing arrangements, outlined above. The pollution abatement and prevention costs are estimated and used to calculate a broader cost recovery rate. However, from the available information, it is not clear whether the actual polluters or rather the water services' customers pay for these costs. In addition, it is not discussed how the pollution charge rebate relates to the implementation of the polluter pays principle in the water services' cost recovery as such a rebate would reduce the coverage of the environmental costs.

6. WFD recommendations

Recommendations - Estonia should:

1. Address the identified lack of compliance of achieving good status by increasing the level of ambition and reducing the compliance gap as much as possible until the next reporting cycle.

[36] Investments for Sustainable Water Management (dated 25 October 2023): https://lifecleanest.ee/sites/cleanest/files/2023-10/Investments%20for%20Sustainable%20Water%20Management%20%20-%20Tanel%20Oppi.pdf

2. Increase the investments and ensure adequate financing in prevention and restoration to ensure achievement of good status as required by the Directive e.g., by making better use of the 'polluter-pays principle' and by eliminating environmental harmful subsidies whilst ensuring affordable, just and implementing fair pricing mechanisms for all water users in line with Article 9 WFD. This should be based on a robust economic evaluation of measures to improve the cost-effectiveness analysis and the prioritisation of measures as well as a better estimation of the investments applied as well as the funding needs.

3. Identify and put in place all basic measures and necessary supplementary measures to reduce existing persistent environmental challenges (pressures) preventing the achievement of good status as those pressures will be aggravated by climate change (e.g., pollution concentrates in times of less water availability).

   This implies, for example:

   a) Reduction of nutrient and other chemical pollution including the setting and achievement of maximum nutrient loads in all river basin districts to achieve the objectives of WFD, MSFD and ND with particular focus on the vulnerability of the Baltic Sea;

   b) Addressing pesticide pollution by reducing their use and phasing out unsustainable practices as well as diffuse sources for the most relevant priority substances (namely mercury, polybrominated diphenyl ethers (PBDEs), cadmium, lead, nickel, cybutryne, and dichlorvos);

   c) Further prevention and reduction of point source pollution to address nutrients and priority substances and river specific pollutants e.g., by reviewing existing permits for point source emissions to lower pollutant loads;

   d) Expanding the efforts on nature-based solutions including re-naturalisation and ecosystem restoration which will reduce the hydromorphological pressures on its water bodies (e.g., reducing pressures from agricultural drainage);

   e) Stepping up efforts to improve river continuity, ensuring minimum ecological flows, improve the general hydrological situation also in cooperation with neighbouring countries;

   f) Wider use of abstraction permits and fees for all water users, monitoring the actual abstracted amounts, and harmonisation of the inconsistent use of exemptions from water fees with the aim to ensure a balance between abstraction and recharge of water bodies in which withdrawals take place, with the aim of achieving good quantitative status of groundwaters and good hydrological conditions of surface waters;

   g) Including a clear provision on periodical review of abstraction and impoundment permits as well as other permits related to hydromorphological changes and describing how this review is implemented in the following RBMPs;

   h) Setting specific measures to achieve the additional objectives for all protected areas under relevant Directives and ensuring their link to the WFD implementation.

4. Enhance the consideration of climate change in all RBMPs and/or develop regional drought management plans where droughts are foreseen to causing problems to the economics and society. Although not explicitly required by the Directive, failure to do so will make it increasingly difficult to achieve the Directive's objective and, in some case, even lead to a deterioration of waters where progress has been achieved.

5. Improve further governance and better coordinate between the different administrative levels and authorities dealing with the implementation of the WFD and other related pieces of legislation. This also

includes removing obstacles identified in the implementation of measures, such as insufficient administrative capacities and resources.

Moreover, Estonia should improve the comparability of status assessment with other EU countries, specifically regarding the assessment of physico-chemical and hydromorphological conditions related to their sensitive biological quality elements.

6. Better apply Article 4(7) in relation to all projects potentially deteriorating status of water bodies (also if this would only be temporary) with sound and thorough justifications in the RBMPs.

7. Further close knowledge gaps and improve data availability, access to data, as well as data quality and comparability by harmonising methods and electronically collected data across river basin districts and marine regions, on monitoring, assessments, projections, economic assessment, etc. and make all data openly available through timely publication in line with the requirements of the Open Data Directive and INSPIRE Directive.

   This implies immediate actions:

   a) Strengthening the monitoring of surface waters by covering all relevant quality elements and chemicals in all water categories. An increased level of monitoring should lead to a lower dependence on expert judgment for the classification of ecological status / potential and chemical status.

   b) Developing chemical status monitoring programmes to ensure all relevant priority substances (including mercury) and River Basin Specific Pollutants are identified.

   c) Providing a detailed quantitative assessment of the additional need for measures to address nutrients, pesticides, and pollution from all the sectors in all RBDs.

   d) Assessing how the planned measures will close the gaps to good status. This will allow to address all point pollutions with concrete measures and better prioritise its measure at water body level.

   This also implies actions for the next RBMPs:

   e) Working towards improving the level of confidence in the classification of groundwater quantitative status.

   f) Assessing the impacts of climate change on the status of the biological and other quality elements at water body level in all RBDs and introduction of possible measures to tackle or mitigate the adverse impact of climate change.

   g) Reporting transboundary groundwater bodies.

   h) Better assessing the achieved and expected effects of the measures in previous cycles providing more details related to pollution from pesticides at water body level.

   i) Further developing the methods to assess ecological potential to include the sensitive biological quality elements in the assessment.

   j) Continuing the efforts to establish type-specific reference for all biological quality elements especially in very large rivers, and complete reference conditions for hydromorphological quality elements in all lake water bodies.

   k) Improving the methodology for establishing ecological flow

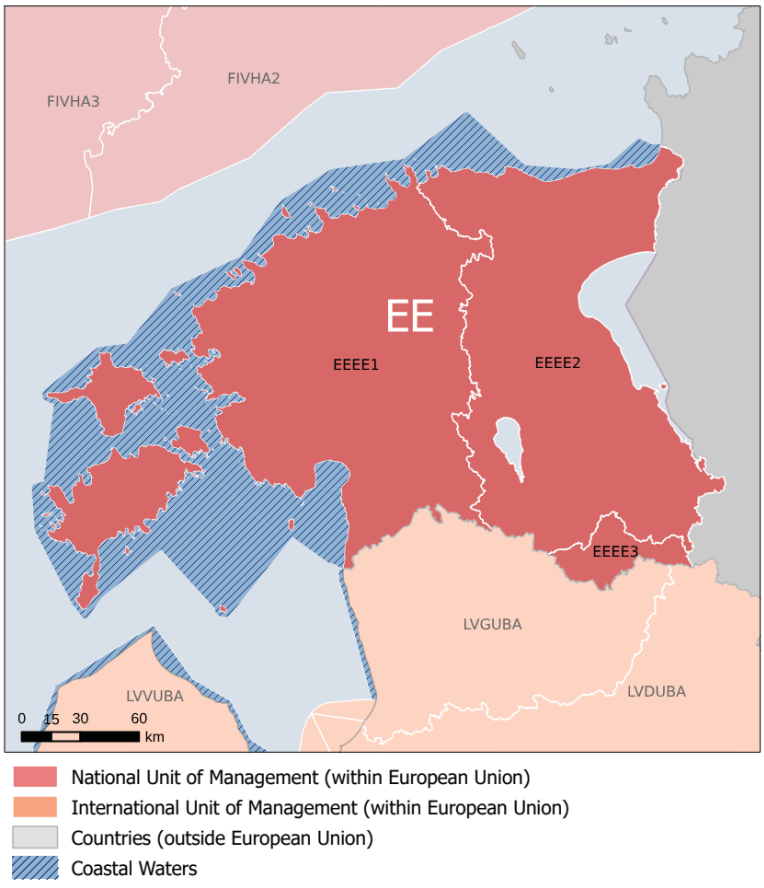
   l) Clarification of the prioritisation of nature-based solutions.

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 the significant risks, map the flood extent and the potential adverse consequences, and take measures to reduce the flood risk. These activities are reflected in (a) the preliminary flood risk assessments, or PFRAs (including the identification of areas of potential significant flood risk, or APSFRs), (b) the preparation of flood hazard and risk maps, or FHRMs, and (c) the establishment of flood risk management plans, or FRMPs.

There are three Units of Management (UoMs) in Estonia, which are the same as the Water Framework Directive's River Basin Districts (RBDs). Fluvial and sea water are considered as potentially significant sources of flooding in Estonia. Estonia has designated 14 Areas of Potential Significant Flood Risk (APSFRs). The influence of climate change on flood risk has been generally considered in Estonia at the time of the second preliminary flood risk assessment. Contradictory, Estonia seems to experience significant climate change, whilst no significant impacts on floods are expected, i.e. both past floods and their significance and impacts remain at the current level. However, the River Basin Management Plans appear to include a more detailed analysis of impacts of climate change on floods and an overview of flood risk mitigation measures, but a clear link and reference to these documents is missing from the 2018 report (i.e. the updated 2018 flood risk assessment of Estonia[37]).



[37] 2018, https://envir.ee/media/828/download

7.1 Flood hazard and risk maps

Estonia is using online map portals[38] for their FHRMs which were prepared at the national level. Maps for floods with low probability (1/1 000 years), with medium probability (1/100 years) and with high probability (1/50 years for the high probability and 1/10 years for the very high probability) are provided. Flood extent is shown on all maps. Water depth is not shown on the maps; however, water levels are shown instead. Number of inhabitants is shown on the maps. Likewise, the type of economic activity is shown on the maps. Installations according to the Industrial Emissions Directive are shown. Potentially affected protected areas[39] are shown in the FHRMs.

APSFRs were updated at the time of the second PFRA and more comprehensive FHRMs were created. Existing hydrometeorological observation data series to update the probabilistic scenarios of water levels were used. Almost all calculations were updated and only for two APSFRs (Maardu city and Kärdla city) calculations were left unchanged. The FHRMs have been updated with new map layers, for example, with a cultural heritage layer.

In terms of changes of contextual information (i.e. the way in which information about the maps is conveyed to the public) since the first FHRMs, the Estonian geoportal is constantly updated, and these changes are also applicable to the FHRMs. The portal has an option to add different additional map layers, for example, economic activities, hospitals, ambulance stations/emergency medical services and rescue teams. This allows users to add objects of interest to the FHRMs.

In terms of changes in methodologies used to prepare flood hazard maps since the first FHRMs, the mapping was based on the same principles as for the first FHRMs. The data were reviewed again for all APSFRs and appropriate modifications made based on measurement series from the available hydrometeorological observation data.

In terms of changes in methodologies used to prepare flood risk maps since the first FHRMs, the estimation of the number of residents in the APSFR has been changed. Residence data, according to the new methodology, are based on residences indicated in the population register, not residences indicated in the census. Therefore, the current population numbers for the second FHRMs differ when compared to 2013 number for the first FHRMs.

As regards the consideration of climate change effects in the preparation of flood hazard and risk maps, reference is made to section 3.7 on ‘adaptation to climate change’.

7.2 Flood risk management plans

Objectives and measures

The three FRMPs can be downloaded from the floods page of the Climate Ministry’s website[40] (previously Ministry of Environment). All three FRMPs set out common objectives for flood risk management: four main objectives and seven sub-objectives set for all UoMs. The three FRMPs state that the purpose of the objectives is to minimise or prevent the adverse effects of flooding on human health, cultural heritage, environment, and economic activity. Sub-objectives call for reducing flood impacts, ensuring safety, and preventing damage during flood events. Several objectives call for non-structural initiatives, including limiting construction in flood-prone areas, operating a flood forecasting and warning system and raising awareness. Estonia reported 101 measures to EIONET. The three

[38] https://xgis.maaamet.ee/xgis2/page/app/yua
[39] Protected areas according to Annex IV(1)(i), (iii) and (v) to WFD
[40] https://kliimaministeerium.ee/merendus-veekeskkond/vesi/uleujutused

FRMPs list measures, and, for each measure, one or more specific actions. The methodology for setting priorities is presented in the FRMPs, and the assigned priority for each action is given in the common Action Plan 2022-27[41] presented with each FRMP. Estonia reported the priority of its measures to EIONET. Nine measures are reported with critical priority – three each for prevention, protection, and recovery and review, and three in each UoM. The Action Plan 2022-27 provides indicators to monitor the completion of its actions. Estonia has reported to EIONET the progress of its measures.

The three FRMPs provide information (in their common Action Plan) on the costs of the actions. The likely funding source is identified for each action. Estonia's Environmental Investment Centre (EIC) is the most frequently mentioned source of funding. The EIC manages domestic funds, EU Cohesion Policy funds, and revenue from the EU Emissions Trading System (EU ETS). The Action Plan for the most part does not specify which funds will cover the costs, though EIC resources in general are mainly foreseen for research and structural measures. In addition, EU Cohesion Policy funds are indicated as a specific source of financing only for the construction or reconstruction of rainwater drainage systems in APSFRs. EU Cohesion Policy funds are expected to be used more widely for flood measures, but further details are not provided. Government budgets (state and local) are mainly used to implement various training and administrative measures. Some measures are foreseen to be funded by businesses or households. A qualitative cost-benefit analysis (CBA) method was used for the actions in the Action Plan. The FRMPs have been drawn up and updated in parallel with RBMPs and their PoMs harmonising the planning of measures affecting water bodies in order to identify synergies and mitigate potential conflicts. The FRMPs call for combined implementation of some measures with those for the RBMPs. The Action Plan encourages the use of nature-based solutions that support water retention on agricultural lands, in water bodies and in wetlands, and calls for the consideration of nature-based solutions when funding technical measures. According to the three FRMPs, the first main objective calls for preventing flood-related risks. Estonia has reported 30 flood prevention measures to EIONET, 19 flood protection measures and 24 preparedness measures. A sub-objective calls for limiting new construction in flood-prone areas. The common Action Plan for the three FRMPs identifies actions related to spatial planning, including training sessions and instructional materials, and the consideration of flood areas in territorial plans. The FRMPs mention that relevant aspects of nature conservation are considered in all APSFRs.

According to the second FRMPs, the first FRMPs lacked clear criteria by which to measure the achievement of their objectives; nonetheless, the second FRMPs provide an indication of progress based on information on the progress of the measures in the first FRMPs: approximately 70% of the activities of the first plan were started or had been completed by the end of 2020, it can be concluded that the objectives of the first plans are also moving towards achievement[42].The second FRMPs state that attention has been paid to a clearer presentation of their objectives and to methods to assess their achievement (which methods are explained in the FRMPs) and that of the implementation of measures[43].Compared to the first FRMPs, the objectives in the second FRMPs are more clearly formulated, as are the sub-objectives. Indicators are set to evaluate fulfilment of the objectives. The sub-objectives of the second FRMPs are clearly linked to measures and actions. Progress on measures is reported by Estonia as: ongoing construction for 10 measures (10% of all measures); ongoing maintenance (recurrent, e.g. maintenance works) for 66 measures (66%), in preparation for three measures (3%); and not started for 22 measures (22%). The progress of almost all preparedness measures (23 measures, 96% of all preparedness measures) is reported as ongoing maintenance

[41] Action Plan is an Annex to the FRMP, https://kliimaministeerium.ee/merendus-veekeskkond/vesi/uleujutused.
[42] FRMP of West Estonia (EE1), p. 38; FRMP of East Estonia (EE2), p. 33; FRMP of Koiva (EE3), p. 23.
[43] FRMP of West Estonia (EE1), p. 38; FRMP of East Estonia (EE2), p. 33; FRMP of Koiva (EE3), p. 23.

(recurrent, e.g. maintenance works). Measures in this category are reported for all aspects, with the smallest number and share for 'other' measures (three). Conversely, 10 'other' measures are reported as not started (59% of 'other' measures), compared to no recovery and review measures and one preparedness measure (4% of this category). For prevention measures, nine measures (30% of this category) are reported as not started. All three measures reported as in preparation are recovery and review measures (27% of all recovery and review measures). Measures in ongoing construction are: four 'other' measures (24% of all 'other' measures); and three prevention and three protection measures (10% and 16% of these categories, respectively). At the time of the first FRMPs, Estonia reported all measures as progress ongoing. The three FRMPs[44] state that 62 of the actions can be considered implemented, with a further 17 being implemented. Four actions are not started. For 27 actions, the FRMPs state that it is not possible to give an assessment of the state of implementation either due to a lack of information or the nature of the measure, but do not provide any further explanation. The information in the FRMPs thus does not match the information reported to EIONET.

Governance

According to the FRMPs, the planned measures do not affect flood risk in the territory of the neighbouring countries. The FRMPs of the West Estonia UoM and the Koiva UoM state that a joint meeting of Estonia, Latvia and Lithuania: all three countries presented their draft 3rd RBMPs and their draft 2nd FRMPs for discussion of cross-border cooperation.

The FRMPs explain that several mechanisms were used to inform the public and interested parties about the consultation process on the draft FRMPs. Public consultation and public discussions of the draft second FRMPs took place over six months and was organised together with consultation of draft RBMPs, marine strategy programmes of measures, and land reclamation conservation plans, in order to increase participation.

The FRMPs were not subject to a Strategic Environmental Assessment.

Consideration of climate change

As regards the consideration of climate change effects in the preparation of flood risk management plans, reference is made to section 3.7 on 'adaptation to climate change'.

Progress identified in the second FRMPs

The second FRMPs provide more information on the FHRMs, including a description of the results. The objectives in the second FRMPs are more clearly formulated, as are the sub-objectives. Indicators are set to evaluate fulfilment of the objectives. The sub-objectives of the second FRMPs are clearly linked to measures and actions (measures are made up of actions). Moreover, the FRMP and Action Plan 2022-2027 determines indicators to monitor the completion of actions and, by extension, of measures. A CBA methodology was not presented in the first FRMPs, although it was stated that CBA was used to prioritise actions, specifically for construction and engineering actions at the local level. The second FRMPs, by contrast, contain a clear description of a qualitative methodology used for all actions. There is progress in providing measure cost information for each UoM. The Action Plan 2022-2027 also provides information on the compatibility of actions with WFD objectives. In the consultation on the second FRMPs, materials from public meetings, including the questions asked and answers given, were published on the government website after the meetings. A wider range of stakeholders was reported as being involved in the second FRMPs, including water supply and sanitation, energy and hydropower, navigation/ports, fisheries and aquaculture, industry, NGOs and academia. The second FRMPs discuss transboundary coordination on flood risk management, a topic

[44] FRMP of West Estonia (EE1), pp. 37-38; FRMP of East Estonia (EE2), pp. 32-33; FRMP of Koiva (EE3), pp. 22-23.

missing in the first FRMPs. In terms of impacts from climate change, the approach is broadly similar to the first FRMPs, however, additional data have been collected and updated forecasts have been made.

8. FD recommendations

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

- consider pluvial flooding in the FHRM;
- provide, in the FRMP, detail on how the FHRM was used in the choice of objectives and measures;
- include, in the FRMP, an assessment of the progress made towards the achievement of the objectives;
- consider insurance as a measure for adaptation to climate change;

8. where appropriate consider flow velocity or relevant water flow in the FHRM and flood conveyance routes in the FRMP, as these are relevant to emergency response;
9. conduct a Strategic Environmental Assessment for the FRMP, depending on the nature of the measures.