EUROPEAN
COMMISSION

Brussels, 26.2.2019
SWD(2019) 46 final

COMMISSION STAFF WORKING DOCUMENT

Second River Basins Management Plans - Member State: Finland

Accompanying the document

REPORT FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT AND THE COUNCIL

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

{COM(2019) 95 final} - {SWD(2019) 30 final} - {SWD(2019) 31 final} - {SWD(2019) 32 final} - {SWD(2019) 33 final} - {SWD(2019) 34 final} - {SWD(2019) 35 final} - {SWD(2019) 36 final} - {SWD(2019) 37 final} - {SWD(2019) 38 final} - {SWD(2019) 39 final} - {SWD(2019) 40 final} - {SWD(2019) 41 final} - {SWD(2019) 42 final} - {SWD(2019) 43 final} - {SWD(2019) 44 final} - {SWD(2019) 45 final} - {SWD(2019) 47 final} - {SWD(2019) 48 final} - {SWD(2019) 49 final} - {SWD(2019) 50 final} - {SWD(2019) 51 final} - {SWD(2019) 52 final} - {SWD(2019) 53 final} - {SWD(2019) 54 final} - {SWD(2019) 55 final} - {SWD(2019) 56 final} - {SWD(2019) 57 final} - {SWD(2019) 58 final} - {SWD(2019) 59 final} - {SWD(2019) 60 final} - {SWD(2019) 61 final} - {SWD(2019) 62 final} - {SWD(2019) 63 final} - {SWD(2019) 64 final} - {SWD(2019) 65 final} - {SWD(2019) 66 final} - {SWD(2019) 67 final} - {SWD(2019) 68 final} - {SWD(2019) 69 final} - {SWD(2019) 70 final} - {SWD(2019) 71 final} - {SWD(2019) 72 final} - {SWD(2019) 73 final} - {SWD(2019) 74 final} - {SWD(2019) 75 final} - {SWD(2019) 76 final} - {SWD(2019) 77 final} - {SWD(2019) 78 final} - {SWD(2019) 79 final} - {SWD(2019) 80 final} - {SWD(2019) 81 final} - {SWD(2019) 82 final} - {SWD(2019) 83 final} - {SWD(2019) 84 final}

Table of contents

Acronyms and definitions

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

Foreword

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

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

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

General Information

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

Source: WISE, Eurostat (country borders)

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

The population of Finland is 5.38 m (ref. Eurostat 2011) and the total surface area is 370 807 km^2, including coastal waters.

Tornionjoki RBD is the Finnish part of the Torne river, shared with Sweden, which forms part of the border between the countries, and to a smaller extent with Norway. The Teno, Näätämöjoki, and Paatsjoki RBD has river basins shared both with the Russian Federation and Norway. The other eastern RBDs Kemijoki and Vuoksi share river basins with the Russian Federation.

The Åland is an autonomous region of the Finnish republic with its own legislation related to water. There are also some differences between water management on the Mainland of Finland and Åland.

Information on areas of the national RBDs including sharing countries is provided in Table A and Finland's share of the international RBDs is shown in Table B.

Table A Overview of Finland's River Basin Districts

RBD	Name	Size* (km^2)	Countries sharing RBD
FIVHA1	Vuoksi	58 158	RU
FIVHA2	Kymijoki-Gulf of Finland	57 074	-
FIVHA3	Kokemäenjoki-Archipelago Sea-Bothnian Sea	83 357	-
FIVHA4	Oulujoki-Iijoki	68 084	RU
FIVHA5	Kemijoki	54 850	RU
FIVHA6	Tornionjoki (Finnish part)	14 587	NO, SE
FIVHA7	Teno-, Näätämöjoki- and Paatsjoki (Finnish part)	25 566	NO, RU
FIWDA	Åland	9 379	-

Source: RBMP reported to WISE.

Finland subsequently clarified that there are no RBDs shared with Russia

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

Name international river basin	National RBD	Countries sharing borders	Co-ordination category	
			2	
			km²	%
Munkelelva/Uutanjoki	FIVHA7	NO, RU	174	73.4
Kem (Viena)	FIVHA4	RU	1 297	4.7
Kemijoki	FIVHA5	RU	49 467	96.8
Naatamo	FIVHA7	NO, RU	2 354	81.0
Oulujoki	FIVHA4	RU	22 509	98.5
Pasvik/Paatsjoki	FIVHA7	NO, RU	14 492	99.9
Teno/Tana	FIVHA7	NO, RU	5 133	31.3
Torneälven/ Tornionjoki	FIVHA6	NO, SE	14 587	36.2
Tuloma/Tuulomajoki	FIVHA7	NO, RU	3 241	12.6
Vuoksi	FIVHA1	RU	58 158	76.9

Source: WISE electronic reporting

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

Status of second river basin management plan reporting

A total of eight RBMPs for Finland (Vuoksi, Kymijoki-Gulf of Finland, Kokemäenjoki-Archipelago Sea-Bothnian Sea, Oulujoki-Iijoki, Kemijoki, Tornionjoki (Finnish part), Teno-, Näätämö- and Paatsjoki (Finnish part), Åland) were published between 8 October 2015 and 3 December 2015. Documents are available from the European Environment Agency EIONET Central Data Repository https://cdr.eionet.europa.eu/.

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

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

- **Governance and public consultation**

  - A broad range of stakeholders was actively involved in the preparation of Finland's RBMPs, including via advisory groups.

  - Finland has strengthened cooperation with Sweden and Norway, including via the preparation of common "roof reports" for their shared iRBDs. Finland also strengthened cooperation with the Russian Federation.

- **Characterisation of the RBD**

  - Many new water bodies have been delineated, particularly if they were relevant for water management or for other reasons such as nature conservation or water use.

  - The typology of rivers and lakes in mainland Finland is based on geographical, geological, chemical and physical characteristics and therefore it is unclear if they have been made biologically relevant. There are several river, lake and coastal water body types that were reported not to have a corresponding intercalibration type, approximately 60 % in total.

  - Type specific reference conditions were reported not to have been established for any water body for relevant hydromorphological quality elements. This may lead to weaknesses in the classification of status/potential according to the hydromorphological quality elements.

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

  - For surface waters and groundwaters, significance of pressures was linked to failure of objectives. However, it is unclear how numerical tools have been used and expert judgement was extensively used. This is likely to give a qualitative rather than a quantitative assessment of the significance on this pressure. In addition thresholds were reported not to be used to assess the significance of pressures in surface water.

- 36 substances were included in an inventory for each of the RBDs, out of the 41 Priority Substances. Tier 1 of the methodology was implemented for most of the substances in the inventories, including for some of the substances deemed relevant at RBD level. Higher tiers of the methodology were also implemented but only for some substances. The data quality was not reported.

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

- The number of monitoring sites in Finland have more than doubled since the first RBMPs, with increased numbers for both surveillance and operational sites in the three relevant water categories. However, the proportion of water bodies with surveillance monitoring for some biological quality elements decreased since the first RBMPs.

- A high proportion of sites were sampled at least at the minimum recommended frequencies for all biological quality elements used for surveillance and operational purposes in all relevant water categories.

- River Basin Specific Pollutants were not monitored for surveillance purposes in coastal waters and in a very few cases in lakes and rivers. Furthermore, none of the substances was monitored at the minimum recommended frequency at any of sites at which they were monitored.

- Only in 6 % of water bodies included in surveillance monitoring were all the required biological quality elements monitored.

- Only 69 % of water bodies included in operational monitoring included at least one biological quality element, while 98 % of river water bodies were monitored for at least one physicochemical quality element.

- In all water categories, the ecological status/potential classification is often based on more quality elements than had been used for the first RBMPs. However, for many water bodies in lakes and coastal waters, the assessment is still based on phytoplankton and nutrients only.

- The overall ecological status/potential in Finland has not improved significantly since the first RBMPs, but there has been a significant improvement in the level of confidence of the classification.

- There are now methods developed for all relevant biological quality elements in all water categories, and these were reported to be sensitive to most reported significant impacts,

although none of them seems to be sensitive to chemical pollution and acidification in coastal waters.

- All the relevant hydromorphological quality elements were reported to be assessed in terms of ecological status/potential. However, the classification boundaries are not related to the class boundaries for the sensitive biological quality elements.

- Only a limited number of physicochemical quality elements were used in the assessment of ecological status/potential of surface water bodies and significant gaps remain.

- Environmental Quality Standards were reported for 13 River Basin Specific Pollutants in water and one in sediment, but these did not include any metals. There is no information available on how the River Basin Specific Pollutants have been identified in the second RBMPs. Finland subsequently indicated that there were no changes in the list of River Basin Specific Pollutants since the first RBMPs.

- Environmental Quality Standards have not been derived in accordance with the Technical Guidance n° 27. The analytical methods used are in line with Articles 4(1) or 4(2) of Directive 2009/90/EC for the strictest standard applied. However, both these have been reported in the first cycle.

- River Basin Specific Pollutants are classified mainly using expert judgement, with only a few using monitoring results.

- Finland reported that the one-out-all-out principle has been used in all RBDs, which had not been the case for the first RBMPs.

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

- Comparing the number of sites and water bodies monitored for operational and surveillance purposes between the first and second RBMPs, there appears to be a net increase in monitoring sites and surface water bodies monitored. However, there remains a significant proportion of surface water bodies that is not monitored for chemical status. Territorial waters are not monitored or assessed for chemical status in Finland. While the increase in the number of sites and water bodies monitored from the first cycle represents some progress, the proportion of surface water bodies monitored for operational and surveillance purposes is low.

- Finland reported that 36 of the 41 groups of Priority Substances were included in an inventory for each of the RBDs. However, across the eight RBDs in Finland only

between three and eight of the groups of Priority Substances in an inventory were reported as being discharged. For seven of the eight RBDs, with the exception of DEHP in the Oulujoki-Iijoki RBD, all of the substances discharged were reported to be monitored.

- For status assessment, where monitoring for chemical status does occur, the number of groups of Priority Substances monitored varies widely: in coastal waters up to five, in lakes only one and in rivers up to 10 groups of Priority Substances were monitored. Finland clarified that mercury, hexachlorobenzene and hexachlorobutadiene were monitored in biota for status assessment (hexachlorobenzene and hexachlorobutadiene being also monitored in water). Finland also clarified that water is supposed to be monitored every month, but in practice, water monitoring may sometimes happen less than 12 times per year. No explanation was provided for the reduced frequency. The monitoring frequency in biota was once per year and every three years in the monitoring cycle for each monitoring site, which is lower than the minimum recommended frequency in the Directive. No explanation was found for the reduced frequency.

- There is no monitoring reported in Finland for long-term trend analysis in sediment and/or biota.

- Overall between the two cycles there was a decrease in proportion of surface water bodies with good chemical status from 64 % down to 49 %, similar decreases occurred across all water body types (artificial, heavily modified and natural). The proportion of surface water bodies failing to achieve good status dramatically increased between the two cycles, from 0.44 % to 49 %. While 36 % of surface water bodies were reported with unknown status in the first RBMP, all water bodies were classified in the second RBMP which represents an improvement from the first cycle.

- 40 out of the 41 groups of Priority Substances in the classification of chemical status were monitored in all the RBDs however in different proportions (i.e. from 0 in one RBD to 40). This would explain that the overall 93 % of surface water bodies in Finland classification for chemical status is with low confidence, 6 % with medium confidence and only 1 % with high confidence regardless of class.

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

- There is very limited monitoring for quantitative status, which has even decreased since the first RBMPs.

- How quantitative status was assessed without monitoring data is not fully clear. Yet, 98 % of groundwater bodies are in good quantitative status.

- Groundwater dependent terrestrial ecosystems and groundwater associated surface waters were considered in status assessment of all river basin districts where such ecosystems exist. Also, their needs have been considered in all river basin districts

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

- The coverage of monitoring for chemical status in groundwater is still very low.

- A number of groundwater bodies is still reported with unknown chemical status. The total number of groundwater bodies failing good chemical status has increased. Monitoring of WFD core substances and of substances causing risk of deterioration in chemical status is very limited.

- Groundwater dependent terrestrial ecosystems and groundwater associated surface waters were considered in status assessment in all river basin districts where such ecosystems exist.

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

- There is no exact description of the changes made to the methodology for designating heavily modified water bodies, but the criteria seem to be defined in a more detailed form than in the first RBMPs. Furthermore, the basis of evaluation of hydrological and morphological status is described in more detail. Information is also provided on the methodology used to assess significant adverse effects, however, no information was found on the assessment of other means to achieve the beneficial objectives served by the modifications of the heavily modified water body. Specific information on the outcome of the assessment of significant adverse effects and better environmental options is not given on a water body level.

- Good ecological potential is defined with the Prague approach on the basis of mitigation measures. Mitigation measures for defining good ecological potential have been reported and the ecological changes expected due to the mitigation measures are described in a qualitative way. However, good ecological potential has not been defined fully in biological terms yet (using all relevant biological quality elements).

- **Environmental objectives and exemptions**

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

- Justifications of technical feasibility for the application of Article 4(4) exemptions are provided, however, further elaboration and clarification may be needed.

- Further information and assessments are needed in order to ensure that the procedures under Article 4(7) are in line with the requirements of the WFD. The fact that expected deterioration from high to good status seems not to trigger an Article 4(7) assessment might be an issue of insufficient and/or non-compliant implementation of WFD requirements.

- **Programme of Measures**

- Finance was reported to have been secured in all RBDs. Costs were reported in each RBMP. However, no information on the costs of the measures for either Programme of Measures was provided in WISE.

- All RBDs in Finland have reported that new legislation or regulations are required and are in progress.

- The KTMs addressing some, but not all significant pressures in both surface water and groundwater have been identified.

- National basic and supplementary measures have been mapped against KTMs.

- 14 national basic measures have been mapped against only four pre-defined KTMs. Not all measures apply in all RBDs.

- No information has been provided on the River Basin Specific Pollutants causing surface water bodies to fail to reach good status. Some individual substances were reported as causing groundwater bodies to fail to be of good status, however no KTMs to control these substances were reported.

- Information on the Priority Substances causing surface water bodies to fail to be of good status has not been reported for three RBDs. For those RBDs where failures were

reported they cover only three substances. KTMs were reported for two of these substances.

- Indicators of the gap to the achievement of environmental objectives have been provided but only for 2015.

- The objectives of the Floods Directive have been considered in the RBMPs. Win-win measures and Natural Water Retention Measures have been included. The design of new and existing structural measures has been adapted for the WFD. Article 9(4) has been applied.

- The RBMPs and Flood Risk Management Plans have not been integrated. The flood protection was reported as "not applicable" to the financing of measures.

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

  - Water abstraction and scarcity have not been reported to be relevant for Finland.

  - All water uses are subject to permitting procedures under Article 11(3)(e), with the exception of small abstractions.

  - Under Article 11(3)(c), measures promoting efficient and sustainable water use (e.g. water metering and allocations) were implemented in the previous cycle.

- **Measures related to pollution from agriculture**

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

  - No gap assessment in terms of reduction needed has been performed, though the area on which each measure is implemented is provided. For pesticides, the number of water bodies failing EQS are reported for all basins except Aland RBD.

  - Safeguard zones for drinking water have been established for abstractions.

  - Implementation of basic measures Article 11(3)(h) for the control of diffuse pollution from agriculture at source is ensured in all RBDs, with the same rules applying across the whole RBD.

  - Supplementary measures for reducing pollution from agriculture were reported. Financing of measures is secured.

- The Programme of Measures heavily relies on voluntary measures.

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

  - Measures to tackle non-agricultural sources of pressures include the construction and upgrade of urban waste water treatment plants, but it is not clear how effective this will be at reducing the emission of nutrients in low-temperature environments.

  - Where measures were reported for Priority Substances causing non-compliance, no indication was given of their effectiveness at achieving the objectives.

- **Measures related to hydromorphology**

  - Operational KTMs to address all or part of the significant hydromorphological pressures were reported for all RBDs. However, indicators on the gap to be filled for significant hydromorphological pressures are only reported for 2015 but not for 2021 or 2027, which does not allow any conclusions on the level of ambition in closing the gap.

  - In the seven mainland RBDs, ecological flows have been derived for some relevant water bodies but the work is still on-going. The ecological flows which have been derived have not been implemented yet but there are plans to do so during next cycle. At the same time, no clear measure is yet included in the RBMPs to review all existing hydropower permits to ensure the achievement of WFD objectives, in particular in relation to ecological flow, fish passes and other mitigation measures.

  - Natural Water Retention Measures are applied in four of eight RBDs to address hydromorphological pressures related to agriculture and flood protection. Examples of Natural Water Retention Measures included are restoration of flood meadows and flood forests as well as constructed wetlands in agricultural areas.

- **Economic analysis and water pricing policies**

  - Cost recovery calculations remain limited – environmental and resource costs have not been included.

  - No information has been provided on ‘adequate incentives’ of pricing policies.

  - No detailed information has been provided on the application of the polluter pays principle.

- A narrow definition of water services has been used. There is no consideration of (cross-) subsidies in the calculated and reported cost recovery rates for the two water services identified.

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

  - The reported monitoring activities for each Protected Area type were similar to that in the first cycle with the exception of that for Protected Areas related to Birds and economically significant species where no monitoring was reported in the second cycle.

  - The RBMPs indicate that two additional measures are to be implemented for the protection of drinking water Protected Areas. However, these are poorly defined.

- **Adaptation to drought and climate change**

  - Climate change was considered in various ways in all river basin districts and it is stated that the Common Implementation Strategy guidance document on how to adapt to climate change was used.

  - All Finnish river basin districts recognise the existence of local or sub-basin drought spells as one of the effects of climate change. However, none of the river basin districts has developed a drought management plan.

Recommendations

- Clear information should be included in national RBMPs on international coordination efforts in order to increase transparency.

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

- Finland should describe clearly the methodology used to identify significant pressures on both surface waters and groundwater.

- Finland should further improve monitoring of surface waters, as there are still important gaps. Monitoring should be extended to cover all water bodies for all relevant quality elements, including hydromorphological quality elements and River Basin Specific Pollutants in coastal waters. For the latter, the coverage for lakes and rivers should increase.

- Finland should have a clear and transparent method for the selection of River Basin Specific Pollutants, and provide clear information on how the status of River Basin Specific Pollutants has been determined, in particular for non-monitored substances. Finland should ensure that Environmental Quality Standards meet the minimum requirements for the protection of freshwater and marine ecosystems from possible adverse effects, as well as of human health, following the requirements of the WFD and the Directive on environmental quality standards.

- An increased level of monitoring should lead to a lower dependence on expert judgement for the classification of ecological status/potential, especially for hydromorphological quality elements and for River Basin Specific Pollutants.

- Finland should strengthen its assessment methods. In particular, the classification boundaries of hydromorphological quality elements should be related to the classification boundaries for the sensitive biological quality elements, and all the relevant physicochemical quality elements should be used in the assessment of ecological status/potential.

- Finland should continue improving the monitoring for status assessment to reach sufficient confidence, spatial coverage and temporal resolution for all the Priority

Substances (including territorial waters whose status should be also assessed). If a different matrix or reduced frequencies are used, the corresponding explanations should be provided, as required by the Directives.

- Finland should ensure that the trend monitoring is up and running so that all the relevant substances specified in Directive 2008/105/EC are monitored in order to provide sufficient data for long-term trend analysis

- Groundwater monitoring should continue to be enhanced in Finland, especially for substances posing risk.

- The improvement of the methodology and subsequent application for the designation of heavily modified water bodies needs to be continued. The assessment of other means to achieve the beneficial objectives served by the modifications of the heavily modified water bodies and the outcome of the assessment of significant adverse effects on the use or the wider environment at water body level need to be made transparent.

- The definition of good ecological potential needs to be continued for all relevant biological quality elements.

- Progress in the application of Article 4(4) exemptions should be continued. The justifications for technical feasibility and disproportionate cost should be elaborated in more detail and further clarified.

- The issue that expected deterioration from high to good status may not trigger an Article 4(7) assessment is an issue of concern. Finland needs to ensure a thorough assessment of proposed new modifications in line with the requirements of the WFD and as further specified by the Judgment of the European Court of Justice in case C-461/13.

- Finland should ensure that KTMs addressing all the significant pressures are identified.

- Indicators of the gap to the achievement of the environmental objectives should be provided.

- KTMs to tackle River Basin Specific Pollutants should be presented, in order to control these reported substances, and assess the likely effectiveness of measures planned to tackle them and Priority Substances causing failure, taking account of the low-temperature conditions.

- Finland should continue improving the linkage of the analysis of pressures and impacts with the identification of measures in the RBMPs in relation to chemical pollution.

- A clear financial commitment for all the RBDs should be ensured. However, FI stated that information on the costs of the measures is provided, but not reported in WISE.

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

- In the third RBMPs, Finland should make more effective use of the cross compliance regime to support WFD objectives, make the links between the WFD and Nitrates Directive more explicit and ensure that an expert and effective advisory service is available to farmers to aid successful implementation of measures. Finland should also ensure that RDP funds are made available to support the successful implementation of the RBMPs' agricultural measures.

- Finland should continue the work on defining ecological flow, and make sure that this is implemented in all RBDs. The revision of all existing hydropower permits should be done to ensure the achievement of WFD objectives, in particular in relation to ecological flow, fish passes and other mitigation measures.

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

- Finland should improve the information in the RBMPs regarding the exemptions and measures put in place for Drinking Waters. Finland has only informed that safeguard zones are in place, but there are no plans to change the regulations.

- Based on the prevalence of local or sub-basin drought spells as one of the effects of climate change, Finland should re-consider preparing drought management plans where appropriate.

Topic 1 Governance and public participation

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

1.1.1 Administrative arrangements – river basin districts

Finland has designated eight RBDs, seven in mainland Finland and one for Åland. Five of these RBDs are part of international RBDs, shared with Norway, Russia and Sweden.

1.1.2 Administrative arrangements – competent authorities

Finland lists 14 authorities at sub-national level: 13 Centres for Economic Development, Transport and the Environment; and the Government of Åland. These authorities all have roles for the preparation and implementation of the RBMPs, except coordination and reporting to the European Commission.

The two national ministries are listed: the Ministry of Agriculture and the Ministry of Environment. Both ministries are responsible for the coordination of implementation of the WFD, and the Ministry of Environment is also responsible for reporting to the European Commission.

1.1.3 RBMP – structure and Strategic Environmental Assessment

Finland reported that no sub-plans to the RBMPs were prepared.

A Strategic Environmental Assessment was prepared for seven of Finland's eight RBMPs. For Åland, a Strategic Environmental Assessment was not reported to WISE; however, Finland informed that a Strategic Environmental Assessment had been carried out for this RBMP.

1.1.4 Public consultation

RBMP documents were available for public consultation for the required six months in all of Finland's RBDs. The public and interested parties were informed by a broad range of means, including: internet, invitations to stakeholders, media (newspaper, TV and radio), meetings and social networking. For all RBDs, copies of the draft documents were available for download and paper copies were available in municipal buildings, and consultation was carried out via direct involvement in drafting the RBMP (see active involvement, below), via Internet and via social networking. For all RBDs except Åland, an online questionnaire was also used. According to information reported to WISE, in the Vuoksi, Kymijoki-Gulf of Finland and Oulujoki-Iijoki RBDs, announcements were made in newspapers and in each municipality of the RBDs; Finland subsequently informed, however, that newspaper announcements were made in all RBDs.

In all of Finland's RBDs, stakeholders were actively involved via the establishment of stakeholder groups as well as involvement in drafting the RBMPs. The stakeholder groups actively involved were: agriculture/farmers, energy/hydropower, fisheries/aquaculture, industry, local/regional authorities, navigation/ports, NGOs/nature protection, water supply and sanitation, land owners' associations, forestry associations, water owners' associations, research institutes. (All these groups participated in each RBD except for energy/hydropower - not listed for Åland - and navigation/ports, not listed for the Vuoksi RBD).

In all Finland's RBDs, public consultation had the following impacts on each of the RBMPs: addition of new information, adjustment to specific measures, changes to the selection of measures and commitment to further research.

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

Finland reported RBMPs and Floods Directive[1] Flood Risk Management Plans in separate plans for the RBDs. In six of Finland's eight RBDs, there was joint consultation of RBMPs and Flood Risk Management Plans (the exceptions being the Vuoksi and Åland RBDs, where no flood risk areas were identified and thus FRMPs were not prepared). Further information on integration with respect to the implementation of measures is provided in Chapter 8 of this report.

Seven of Finland's eight RBDs organised joint consultation on the RBMPs and on the Marine Strategy Framework Directive[2] (the exception being the Åland RBD).

1.1.6 International coordination

Finland reports on international co-ordination in two RBDs. Finland reports agreement on international RBMPs for the Tornionjoki RBD, shared with Sweden, and for the Teno, Näätämöjoki and Paatsjoki RBD, shared with Norway. Finland's reporting to WISE indicates that joint RBMPs were prepared for these two RBDs shared with Sweden and Norway.

For the catchments shared between Finland and Norway (which are part of Finland's Teno, Näätämökjoki and Paatsjoki RBD, FIVHA7) cooperation has included monitoring, the preparation of a common "roof report" that includes descriptions of co-operation, characteristics of the international river basin district, impact of human activity, state of the

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

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

waters, monitoring network, environmental objectives and measurements. This document is available in Finnish, Norwegian, Sami and English.

Finland's Tornionjoki RBD (FIVHA6) is shared with Sweden and Norway. Sweden and Finland have prepared a common "roof report" which includes descriptions of co-operation, characteristics of the international river basin district, impact of human activity, state of the waters, monitoring networks, environmental objectives and measurements. This report has been published in four languages; Finnish, Swedish, Sami and Tornedalian Finnish, Meänkieli.

For each international RBD, the common roof report plus the national RBMPs are together considered as the international RBMP (for further information see the reports on international coordination on the Water Framework Directive).

Finland has bilateral agreements with Sweden and Norway: under each, there is a commission for coordination on shared surface water bodies that has addressed water management.

Four of Finland's RBDs are part of international RBDs shared with Russia: Vuoksi, Oulujoki-Iijoki, Kemijoki and Teno, Näätämöjoki and Paatsjoki. Under the Finnish-Russian Cross-Border Commission[3] , there are working groups on water resources and water protection, plus a sub-group on fisheries. Cooperation has covered monitoring activities and research projects.

The Finnish-Russian Cross-Border Commission established a cooperation which aims to reach good water status. Recent cooperation milestones included, for example, an updated monitoring programme in 2015, a revised map of transboundary catchment areas in 2014 and a decision to start preparing a joint risk management programme in 2013[4].

Russia has an observer status in the Finnish-Norwegian Transboundary Water Commission's meetings[5]. Murmansk regional environment authorities work in cooperation with matters related to the international River Paatsjoki catchment (shared also with Norway).

1.2 Main changes in implementation and compliance since the first cycle

The main change has been the strengthening of cooperation with Sweden and Norway, including the development of common International RBD "roof reports" that bring together the respective national RBMPs.

[3] http://rajavesistokomissio.fi/

[4] More information about co-operation projects is available at http://www.pasvikmonitoring.org/.

[5] See:http://www.ymparisto.fi/fi-FI/Vesi/Vesiensuojelu/Rajavesistoyhteistyo_Lapissa/Suomalaisnorjalainen_rajavesistokomissio

1.3 Progress with Commission recommendations

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

- Recommendation: *International co-ordination with Sweden and Norway as well as the Russian Federation need to be extended.*

  Assessment: Finland has deepened its coordination with Sweden and Norway in shared RBDs, including via the preparation of common "roof reports" that bring together the respective national RBMPs. Finland's ongoing cooperation activities with the Russian Federation have also strengthened, including activities such as monitoring and mapping.

  Consequently, Finland has implemented this recommendation.

Topic 2 Characterisation of the River Basin District

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

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

There has been an overall increase in the number of river water bodies (19 %) but particularly in the Kokemäenjoki -Archipelago Sea-Bothnian Sea (56 %), Vuoksi (32 %) and Kymijoki-Gulf of Finland (21 %) RBDs (Table 2.1). There has also been an overall increase in the number of lake water bodies of 8 %, with the highest increase in the Kokemäenjoki-Archipelago Sea-Bothnian Sea RBD of 29 %. The numbers of coastal water bodies remained the same.

Table 2.2 shows the differences in size distribution of surface water bodies in Finland between the second and first RBMPs. There was a slight decrease overall in the minimum size of rivers. The minimum size criteria reported were 100 km^2 catchment area for rivers and 0.5 km^2 surface area for lakes. The RBMP reported that smaller rivers and lakes have also been considered if they were particularly relevant for water management or other reasons like nature conservation or water use. This is the reason many new water bodies have been delineated. For example, the Vuoksi RBD delineated new water bodies because of their nature value or because of the need to consider a wider river network.

In the second RBMP, 98 % of identified surface water bodies were natural with 2 % being designated as heavily modified and only 0.5 % artificial. Overall there were very little changes in the numbers of heavily modified and artificial water bodies between the first cycle and the second cycle, less than 1 % difference (Figure 2.1).

The numbers of groundwater bodies remained largely the same with the exception of the Åland RBD which decreased from 34 to 5[6] (Table 2.3). The water uses and physical alteration have been reported for each water body type.

Table 2.4 summarises the information provided by Finland on how water bodies have evolved between the two cycles. The water body types with the most changes were river and lake water bodies, with water bodies created, split and deleted.

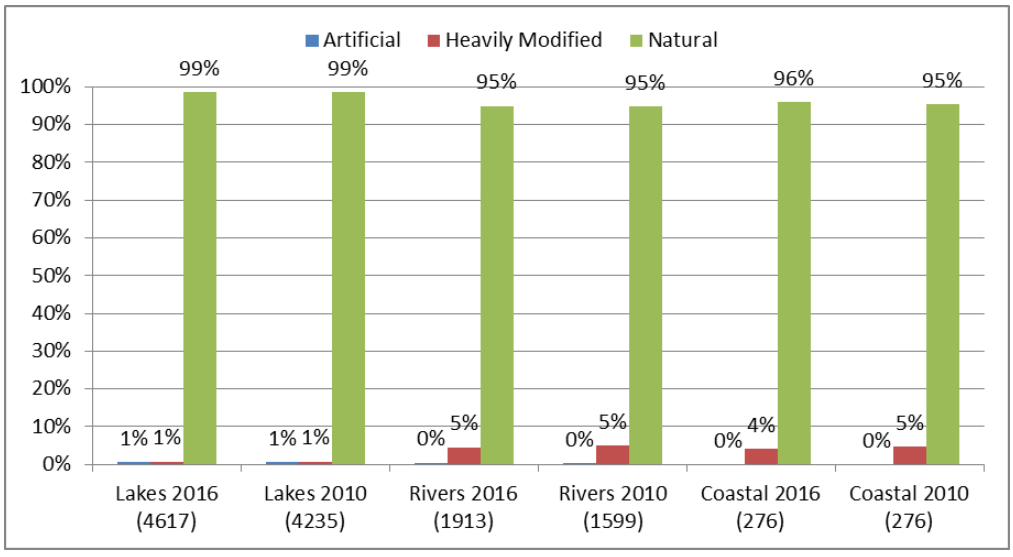
[6] Finland subsequently stated this must be a reporting error from the first RBMP.

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

Year	RBD	Rivers		Lakes		Coastal	
		Number of water bodies	Total length of water body (km)	Number of water bodies	Total area (km^2) of water bodies	Number of water bodies	Total area (km^2) of water bodies
2016	FIVHA1	328	3 880	1 182	10 400	0	0
2016	FIVHA2	323	3 999	910	6 619	54	6 108
2016	FIVHA3	437	7 215	621	3 639	134	14 295
2016	FIVHA4	278	7 180	969	4 202	19	3 320
2016	FIVHA5	301	7 974	435	1 683	5	913
2016	FIVHA6	103	2 334	169	481	3	105
2016	FIVHA7	143	3 172	317	1 793	0	0
2016	FIWDA	0	0	14	11	61	7 766
2016	*Total*	*1 913*	*35 753*	*4 617*	*28 826*	*276*	*32 507*
2010	FIVHA1	248	2 758	1 040	10 207	0	0
2010	FIVHA2	267	3 154	850	6 447	54	6 092
2010	FIVHA3	281	5 027	482	3 473	134	14 337
2010	FIVHA4	274	6 436	975	4 157	19	3 327
2010	FIVHA5	300	6 849	432	1 641	5	916
2010	FIVHA6	99	2 044	166	494	3	106
2010	FIVHA7	133	2 607	316	1 742	0	0
2010	FIWDA	0	0	14	11	61	7 791
2010	*Total*	*1 602*	*28 875*	*4 275*	*28 172*	*276*	*32 570*

Source: WISE electronic reporting.

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



Source: WISE electronic reporting.

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

Year	RBD	River length (km)			Lake area (km^2)			Coastal (km^2)		
		Minimum	Maximum	Average	Minimum	Maximum	Average	Minimum	Maximum	Average
2016	FIVHA1	0.24	70.41	11.83	0.03	853.72	8.8			
2016	FIVHA2	0.14	83.75	12.38	0.04	459.15	7.27	2.67	1 051.87	113.12
2016	FIVHA3	0.17	78.36	16.51	0.04	210.49	5.86	0.14	1 532.13	106.68
2016	FIVHA4	1.02	187.81	25.83	0.03	902.71	4.34	0.9	1 341.87	174.73
2016	FIVHA5	0.81	230.51	26.49	0.09	326.72	3.87	31.73	767.59	182.57
2016	FIVHA6	1.82	250.37	22.66	0.36	52.84	2.84	15.58	69.53	35.14
2016	FIVHA7	0.78	115.38	22.18	0.12	1 083.91	5.66			
2016	FIWDA				0.17	1.99	0.78	0.11	1 561.26	127.31
2010	FIVHA1	0.14	68.89	11.12	0.04	847.93	9.81			
2010	FIVHA2	0.2	81.93	11.81	0.02	458.67	7.58	2.7	1 050.37	112.82
2010	FIVHA3	0.42	86.29	17.89	0.01	208.71	7.21	0.15	1 542.39	106.99
2010	FIVHA4	0.96	183	23.49	0.03	878.14	4.26	0.73	1 342.18	175.12
2010	FIVHA5	0.4	227.2	22.83	0.09	315.4	3.8	34.14	767.76	183.15
2010	FIVHA6	1.7	251.8	20.64	0.46	53.34	2.98	15.31	69.5	35.51
2010	FIVHA7	2.1	152.6	19.6	0.12	1 040.28	5.51			
2010	FIWDA				0.17	1.98	0.77	0.11	1 565.93	127.73

Source: WISE electronic reporting

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

Year	RBD	Number	Area (km^2)		
			Minimum	Maximum	Average
2016	FIVHA1	705	0.01	55.48	3.12
2016	FIVHA2	946	0.01	61.07	2.35
2016	FIVHA3	1 078	0.01	80.08	2.52
2016	FIVHA4	570	0.01	97.39	3.89
2016	FIVHA5	331	0.1	13.14	1.23
2016	FIVHA6	115	0.14	6.06	1.08
2016	FIVHA7	23	0.12	52.1	3.51
2016	FIWDA	5	0.01	2.65	0.79
2016	*Total*	*3 773*			
2010	FIVHA1	705	0	55.48	3.17
2010	FIVHA2	961	0	61.09	2.38
2010	FIVHA3	1 093	0.08	80.2	2.7
2010	FIVHA4	555	0.05	97.39	3.88
2010	FIVHA5	322	0.1	13.14	1.21
2010	FIVHA6	110	0.14	5.62	1.07
2010	FIVHA7	24	0.12	52.1	3.38
2010	FIWDA	34	0.38	2.66	1.28
2010	*Total*	*3 804*			

Source: WISE electronic reporting.

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

Type of water body change for second cycle (wiseEvolutionType)	Groundwater	Rivers	Lakes	Coastal
Aggregation		2	8	
Splitting		26	23	
Aggregation and splitting			1	
Creation	103	301	361	
Deletion	146	18	51	
Extended area				
No change	3 670	1 584	4 224	276
Total water bodies before deletion	3 919	1 931	4 668	276
Delineated for second cycle (after deletion from first cycle)	3773	1 913	4 617	

Source: WISE electronic reporting.

2.1.2 Identification of transboundary water bodies

Transboundary river and lake water bodies have been identified in all the following RBDs: Vuoksi, Oulukoki-Iijoki, Kemijoki, Tornionjoki and Teno, Näätämöjoki and Paatsjoki. In the Tornionjoki RBD, there is a common basin with Sweden, and there was reported to be strong coordination. Status classification was coordinated for all transboundary surface water bodies (three lakes, two rivers and one coastal area), but coordination of delineation was not explicitly mentioned. Finland clarified that the coordination of delineation took place in preparation for the first RBMP and the same delineation was used again in the second RBMP, so no additional coordination was required. In the Teno, Näätämöjoki and Paatsjoki RBD, coordination is in place in delineation of transboundary surface water bodies with Norway. In the Vuoksi RBD, there was no mention of coordination with Russia on the delineation of water bodies.

2.1.3 Typology of surface water bodies

In general, the number of types remained largely the same between the first and the second cycle (Table 2.5), with a 1 % increase overall. However, in the RBMPs it was noted that there was a review of typologies but the outcome is unclear. The Åland RBMP reported that lakes were reclassified more precisely into the calcium rich category (Rk) following the splitting of the type RrRk into two in the national typology, however only the national type Rk was reported to WISE.

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

RBD	Rivers		Lakes		Coastal	
	2010	2016	2010	2016	2010	2016
FIVHA1	10	12	13	13	0	0
FIVHA2	10	10	12	12	4	4
FIVHA3	10	10	12	11	9	9
FIVHA4	8	8	11	12	2	2
FIVHA5	10	10	11	11	2	2
FIVHA6	11	11	9	10	2	2
FIVHA7	11	11	6	7	0	0
FIWDA	0	0	3	1	3	3
TOTAL	17	19	14	15	14	14

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

The typology of rivers and lakes in mainland Finland is based on the geographical, geological as well as chemical and physical characteristics and therefore it is unclear if they have been made biologically relevant. The typology of lakes in the Åland RBD is also based on macrophytes in the case of calcium rich soil types. The typology of coastal waters is based on the geographical, chemical and physical characteristics, and it is made biologically relevant by using data on flora and fauna as an additional typology criteria.

Member States were asked to report "Not applicable" if there is no corresponding intercalibration type for national types. Many national types (heavily modified, artificial and natural) have been intercalibrated. However, in each of the RBDs there are several river, lake and coastal water bodies that were reported not to have a corresponding intercalibration type, approximately 60 % in total.

The typology has been coordinated between Finland and Sweden in the Tornionjoki RBD and there is a report defining the common typology. For the Teno, Näätämöjoki and Paatsjoki RBD, there is information on coordination with Norway of the international water bodies, but there is no direct reference to typology. In the Vuoksi RBD, there is coordination with Russia on monitoring, but typology again is not mentioned.

2.1.4 Establishment of reference conditions for surface water bodies

Table 2.6 shows the percentage of surface water body types in Finland with reference conditions established for the first and second cycles. Type specific reference conditions have

been established for most relevant biological quality elements and some relevant physicochemical biological quality elements for most river types. Type specific reference conditions were reported to have not been established for any water body for relevant hydromorphological biological quality elements. This may lead to some weaknesses in the classification of status/potential according to the hydromorphological biological quality elements.

Finland have been active in the EU intercalibration process for biological quality elements and the results of these intercalibration exercise has been transferred into national types.

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

Water category	Water types	Biological quality elements	Hydromorphological quality elements	Physicochemical quality elements
Rivers (19)	All	79 %		
	Some	11 %		89 %
	None	11 %	100 %	11 %
Lakes (15)	All	40 %		87 %
	Some	47 %		
	None	13 %	100 %	13 %
Coastal (14)	All	100 %		100 %
	Some			
	None		100 %	

Source: WISE electronic reporting

2.1.5 Characteristics of groundwater bodies

The geological formation of the aquifer types in which groundwater bodies reside have been reported. All groundwater bodies were reported not to be layered. Further characterisation work has been reported since the first cycle with the inclusion of the assessment of linkages with surface water bodies and terrestrial ecosystems for all RBDs.

2.1.6 Significant pressures on water bodies

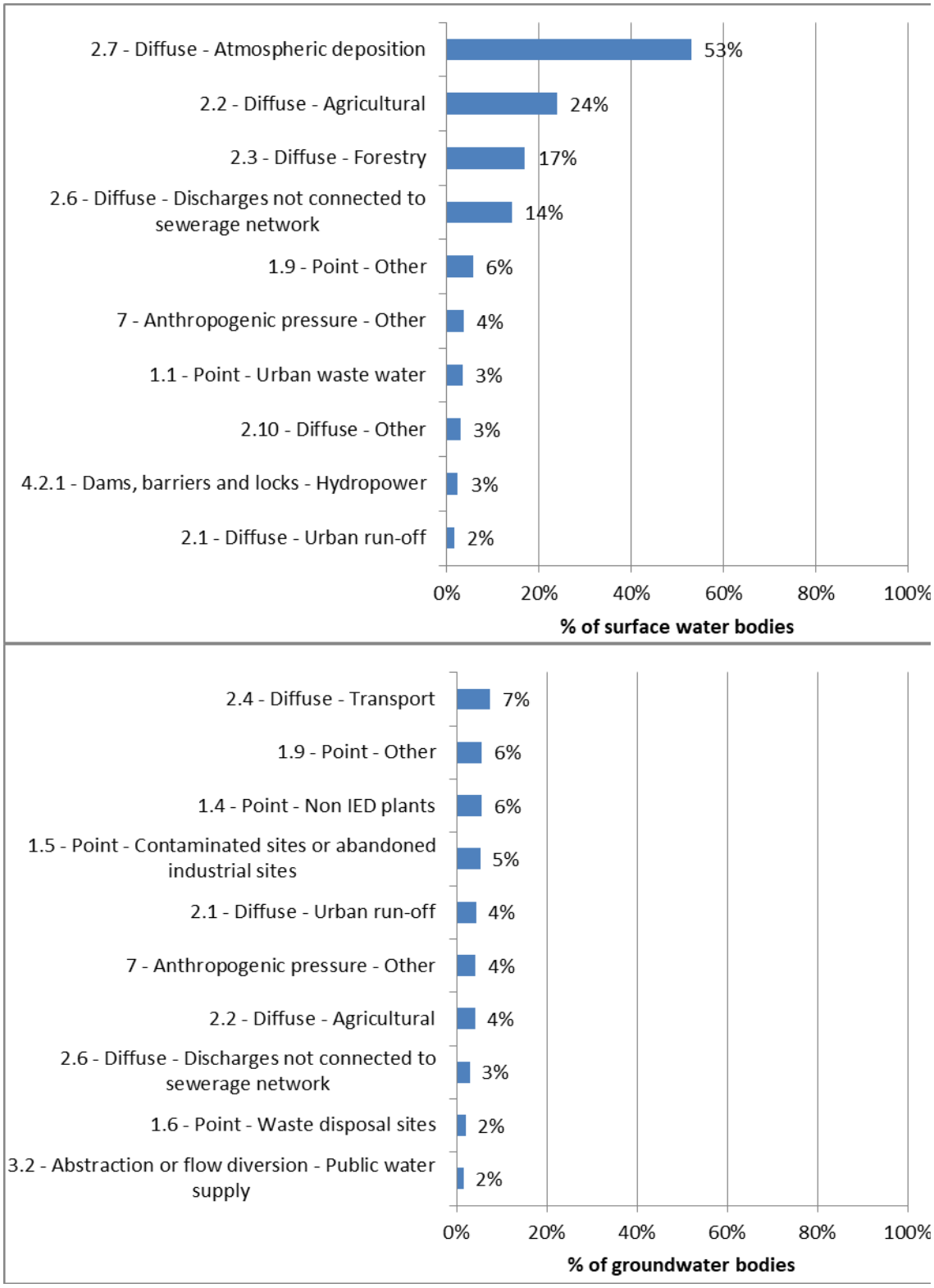
In the second cycle, atmospheric deposition was reported to affect the largest proportion (53 %) of surface water bodies, followed by no significant pressures (33 %) and then by diffuse agricultural pressures (24 %) (Figure 2.2). In the first cycle, Finland only reported pressures at an aggregated level. Overall there appears there was a large decrease in the number of water bodies where “No pressures” were reported between the first and the second cycle

(approximately a 50 % reduction), with an increase in the reporting of point and hydromorphological pressures and a significant increase in the number of diffuse pressures (Figure 2.3).

For groundwater bodies the significant pressure reported most frequently was diffuse – transport with 7 % of groundwater bodies affected (Figure 2.2) and “no significant pressures” were reported most frequently.

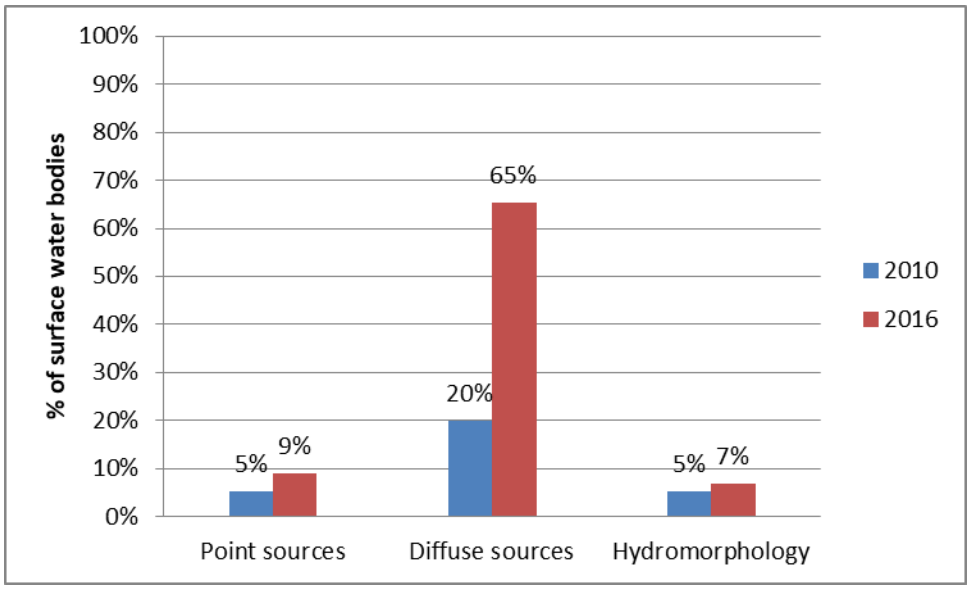
For the second RBMP, it was reported that all significant pressures were assessed for surface waters or groundwaters.

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



Source: WISE electronic reporting

Figure 2.3 ***Comparison of pressures on surface water bodies in Finland in the first and second cycles. Pressures are presented at the aggregated level. Note there were 6806 identified surface water bodies for the second RBMPs and 6153 for the first RBMPs***



Source: WISE electronic reporting.

2.1.7 Definition and assessment of significant pressures on surface and groundwater

For surface waters numerical tools and expert judgement were used for defining significant pressures from point and diffuse sources, abstraction and water flow pressures. In the Åland RBD all the pressures on surface water were assessed using numerical tools. For surface water bodies, significance of pressures was reported as being linked to the potential failure of objectives. Pressures were reported not to be defined in terms of thresholds, but significance is assessed using a type and extent of activity and pressure type[7].

For example, for point sources, the pressure was considered to be significant if the loading (or in combination with other pressures) may cause the status to be less than good. A significant pressure due to abstractions on surface water is similarly defined when there is potential for the status to be less than good. The determination of the significance of hydromorphological pressures (changes) was described as an expert assessment in the RBMP, using criteria set for assessing changes and scoring system. For diffuse sources there is an indication that thresholds are used for significant loading of phosphorus.

[7] Finland clarified that for Åland thresholds are used for surface water and this is an error in the WISE reporting.

For groundwaters, numerical tools and expert judgement were used for defining significant pressures from point and diffuse sources, abstraction and artificial recharge pressures. The Åland RBD used expert judgement only for assessing diffuse pressures and artificial recharge pressures were not assessed[8]. For groundwater bodies significance of pressures has been defined in terms of thresholds and the significance of pressures was reported to be linked to the potential failure of objectives.

For point source and diffuse pressures in groundwater, the RBMPs explained that expert judgment was used to assess the risk using a classification scale and considering the chemical state of the groundwater. The thresholds were based on the chemical quality of the groundwater and no "artificial" organic compounds should be detected in groundwater and no inorganic compounds over a defined threshold. No thresholds were used to assess water abstraction pressures. It is unclear from the RBMP and background documents how numerical tools were used to assess the significance of pressures on groundwater.

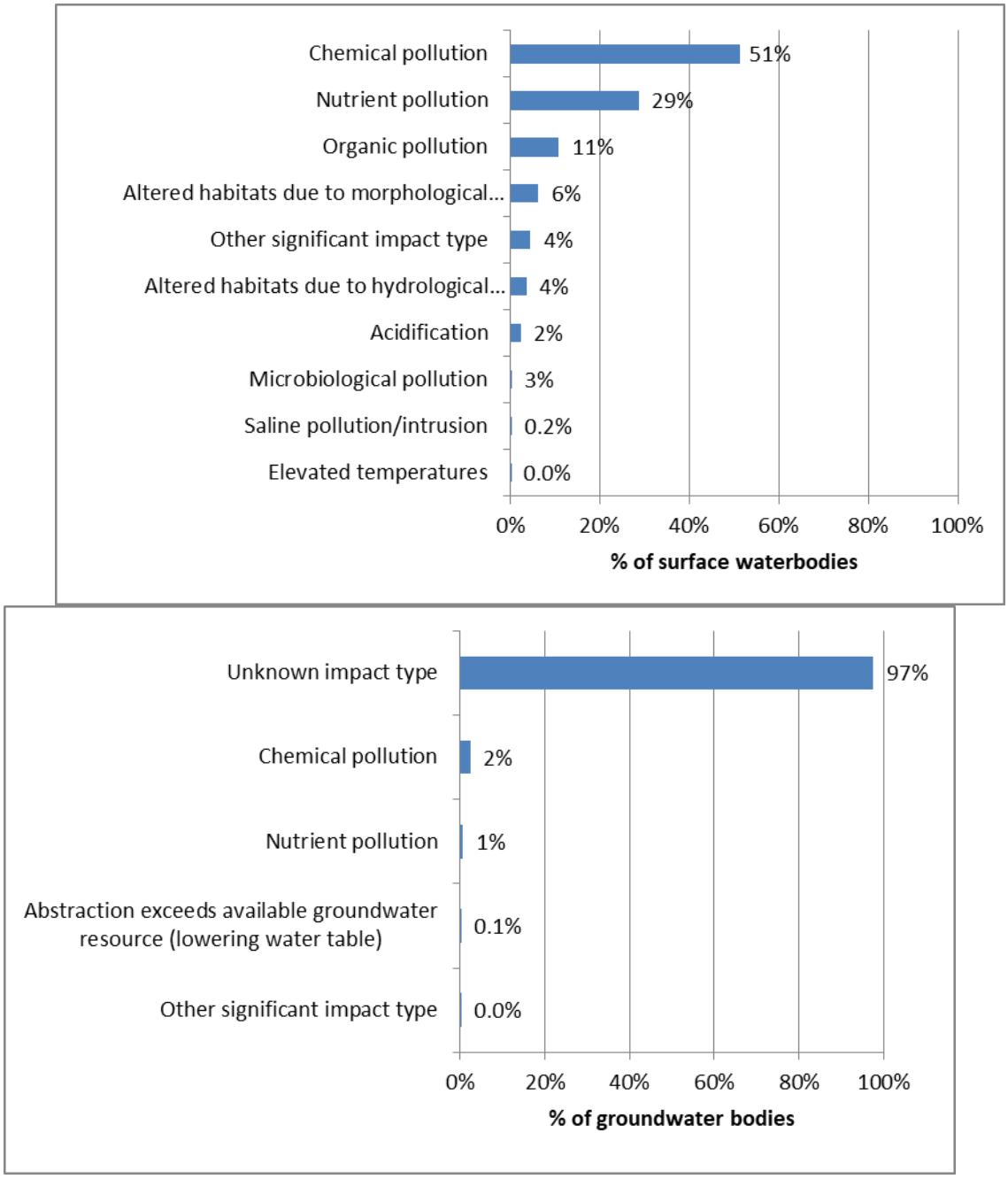
2.1.8 Significant impacts on water bodies

In the second cycle, the most significant impact on surface water bodies was chemical pollution (51 % of surface water bodies)[9], followed by nutrient pollution (29 %) (Figure 2.4). 33 % of surface water bodies were reported to have no significant impact. 97 % of groundwater bodies were reported to have an "unknown impact type". Finland did not report on impacts in the first cycle.

[8] Finland subsequently clarified that Åland do not have artificial recharge pressures.

[9] Finland further clarified that the reason chemical pollution is the most significant impact is due to the long-range transport of airborne mercury.

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



Source: WISE electronic reporting

2.1.9 Groundwater bodies at risk of not meeting good status

In five of the eight RBDs between 1.5 and 8 % of groundwater bodies were reported to be at risk of failing to meet good chemical status. The pollutants putting groundwater bodies at risk of failing good chemical status have been reported for all RBDs.

In four of the eight RBDs between 0.21 and 6.32 % of groundwater bodies were reported to be at risk of failing to meet good quantitative status. Further information on the quantitative and chemical status of groundwater bodies is provided in Chapters 5 and 6 of this report.

2.1.10 Quantification of the gap and apportionment of pressures

There are some inconsistencies in the pressures for which measures are planned and the significant pressures reported at the water body level. For example, in the Kymijoki-Gulf of Finland RBD, dams, barriers and locks from irrigation has been reported at the surface water body level, but this pressure has not been reported as being tackled in the Programme of Measures. Similarly, in the Vuoksi RBD, pressure diffuse - atmospheric deposition has been reported at the groundwater bodies level but this pressure has not been reported as being tackled in the Programme of Measures.

Four Priority Substances (mercury and its compounds, nickel and its compounds, cadmium and its compounds, tributyltin-cation) were reported to be causing the failure of good chemical status in Finland. The indicator gap values have not been reported for 2021 (or 2027), therefore it does not appear that there are measures to tackle these substances causing failure to achieve good status by 2027 in all RBDs[10]. Further information on the implementation of the Programme of Measures is provided in Chapters 9 to 13 of this report.

2.1.11 Inventories of emissions, discharges and losses of chemical substances

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

Finland reported that 36 substances consistently appeared in all the inventories for all RBDs. Only two substances (tributyltin-cation and brominated diphenylethers (congener numbers 28, 47, 99, 100, 153 and 154)) were listed as being excluded from the inventories in each of the

[10] Finland highlighted that in case of mercury, a statement was made in Annex 0 that national measures do not exist for long-range transport of airborne pollutants (see also e.g. Oulujoki-Iijoki RBMP, p. 104-105).

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

eight RBDs and three substances were not reported on, no explanation of this was found in the RBMPs[12].

The two step approach from the Common Implementation Strategy Guidance Document n°28[13] has been followed for all substances considered in the inventories.

Tier 1 of the methodology was implemented for most of the substances in the inventories, including for some of the substances deemed relevant at RBD level (the Guidance Document recommends implementing at least Tier 1+ 2 for substances deemed relevant at RBD level). For the remaining substances, Tier 4 (source oriented approach) or a combination of Tier 1 (point source information) +Tier 2 (riverine load) + sometimes Tier 3 (pathway oriented approach) were implemented.

The data quality was not reported.

2.2 Main changes in implementation and compliance since the first cycle

There has been an overall increase in the number of river water bodies (19 %) but particularly in the Kokemäenjoki-Archipelago Sea-Bothnian Sea (56 %), Vuoksi (32 %) and Kymijoki-Gulf of Finland (21 %) RBDs. There has also been an overall increase in the number of lake water bodies of 8 %, with the highest increase in the Kokemäenjoki-Archipelago Sea-Bothnian Sea RBD of 29 %. The numbers of coastal water bodies remained the same. The numbers of groundwater bodies remained largely the same. In general, the number of types remained largely the same between the first and the second cycle, with a 1 % increase in types overall. However there was a review of typologies but the outcome was unclear.

Overall it appears there was a large decrease in the number of occasions were “No pressures” were reported between the first cycle and the second cycle (approximately a 50 % reduction), with an increase in the reporting of point and physical and hydrological pressures and a significant increase in the number of diffuse pressures.

[12] Finland further stated that All the inventories for each RBDs are published in the web pages http://www.ymparisto.fi/fi-FI/Vesi/Vesiensuojelu/Vesienhoidon_suunnittelu_ja_yhteistyo/Suunnitteluopas/Vesipuitedirektiivin_mukainen_vesiympari%2829371%29

[13] CIS Guidance N° 28 - Preparation of Priority Substances Emissions Inventoryhttp://ec.europa.eu/environment/water/water-framework/facts_figures/guidance_docs_en.htm

2.3 Progress with Commission recommendations

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

- Recommendation: *Finland needs to review its designation of water bodies, since whilst using system B, they have not achieved the same degree of differentiation as required by system A, notably as regards the size of water bodies. Very large minimum size thresholds for both rivers and lakes, that is not in compliance with the WFD requirement, have been used. As a result, many waters are excluded from the RBMPs and only 4261 lake water bodies have been identified.*

  Assessment: There was a slight decrease overall in the minimum size of rivers. The minimum size criteria reported were 100 km^2 catchment area for rivers and 0.5 km^2 surface area for lakes. The RBMP reported that smaller rivers and lakes have also been considered if they were particularly relevant for water management or other reasons like nature conservation or water use. This is the reason why many new water bodies have been delineated. For example, the Vuoksi RBD delineated new water bodies because of their nature value or because of the need to consider a wider river network. This recommendation has therefore been fulfilled.

- Recommendation: *Clarify the methods used and criteria applied for determining pressures in the RBMPs.*

  Assessment: For surface waters a combination of numerical tools and expert judgement were used for defining significant pressures from point and diffuse sources, abstraction and water flow pressures. In the Åland RBD all the pressures were assessed using numerical tools. For groundwaters numerical tools and expert judgement were also used for defining significant pressures from point and diffuse sources, abstraction and artificial recharge. The Åland RBD used expert judgement only for assessing diffuse pressures and artificial recharge pressures were not assessed.

  For surface water bodies it was reported that pressures were not to be defined in terms of thresholds but for groundwater bodies thresholds were reported as being used.

  The methodology and thresholds for determining significant pressures were described but it is unclear if this recommendation has been fulfilled.

- Recommendation: *Moreover, the links between different pressure-impact-measures should be further explained. Measures should be more concrete and include the final expected achievements and, if possible, quantify the impact in terms of the WFD objectives.*

- Recommendation: *Ensure close linkage of the analysis of pressures and impacts with the determination of measures in the RBMPs in relation to chemical pollution.*

  Assessment: These recommendations apply to a number of Topics. In terms of characterisation of significant pressures or impacts, for surface waters and groundwaters a combination of numerical tools and expert judgement were used for defining significant pressures. It is not possible to determine how quantitative these methods were, based on the information available, but there appears to be a reliance on expert judgement. It has not been reported whether there are measures to achieve good status by 2027 in all RBDs by tackling Priority Substances reported to be causing the failure of good chemical status in Finland. The indicator gap values do not appear to have been reported for 2021 and 2027.Therefore this recommendation does not appear to have been fulfilled.

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

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

3.1.1. Monitoring of ecological status/potential

Monitoring programmes

Article 8.1 of the WFD requires Member States to establish monitoring programmes for the assessment of the status of surface water and of groundwater in order to provide a coherent and comprehensive overview of water status within each RBD. Territorial waters are not a water body category under WFD. However, it should be noted that under Article 2(1) of the WFD, territorial waters are included for the assessment and reporting of chemical status.

Finland reported monitoring programmes for each of the water categories identified in the RBDs. No programmes were reported for transitional and territorial waters.

Monitoring sites and monitored water bodies used for surveillance and operational monitoring

Finland reported monitoring programmes for each of the water categories identified in the RBDs. Table 3.1 gives the number of sites used for different purposes for the second RBMPs and Table 3.2 compares the number of monitoring sites used for surveillance and operational purposes from the first to the second RBMPs.

Table 3.1 Number of monitoring sites in relevant water categories used for different purposes in Finland

Monitoring Purpose	Rivers	Lakes	Coastal
BWD - Recreational or bathing water - WFD Annex IV.1.iii	9	44	16
CHE - Chemical status	962	1 648	281
DWD - Drinking water - WFD Annex IV.1.i	5	18	
ECO - Ecological status	962	1 648	281
HAB – Protection of habitats or species depending on water - WFD Annex IV.1.v	71	102	58
INT - International network of other international convention	3	5	
INV - Investigative monitoring	3	2	
MSF - Marine Strategy Framework Directive monitoring network	4		
OPE – Operational monitoring	591	627	227
REF – Reference network monitoring site	81	166	3
RIV - International network of a river convention (including bilateral agreements)	15	1	
SOE - EIONET State of Environment monitoring	136	208	
SUR - Surveillance monitoring	481	1 126	93
Total sites irrespective of purpose	*962*	*1 648*	*281*

Source: WISE electronic reporting

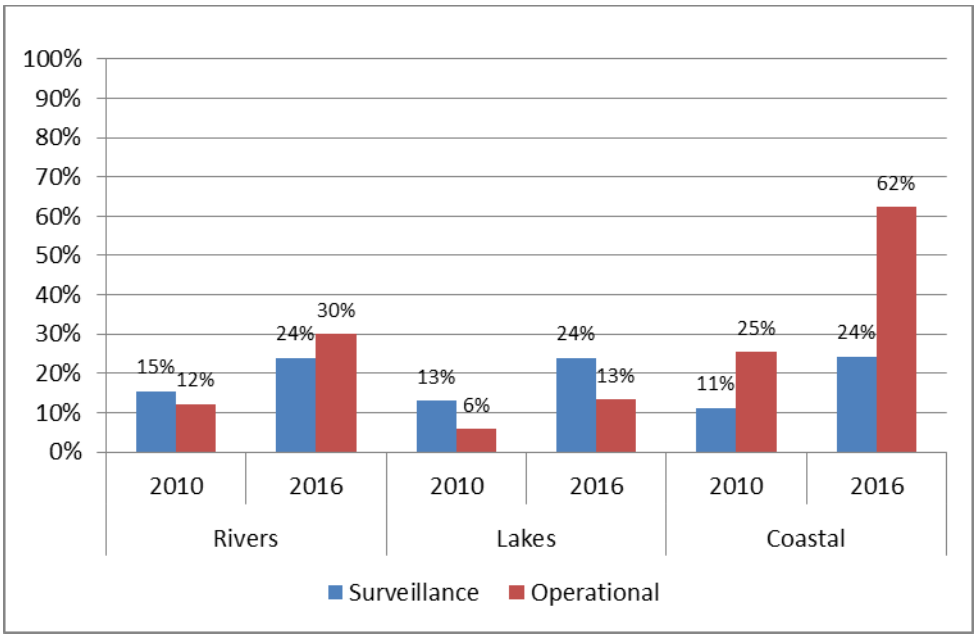
Table 3.2 Number of sites used for surveillance and operational monitoring in Finland for the second and first RBMPs. Note that for reasons of comparability with data reported in 2010, the 2016 data does not take into account whether sites are used for ecological and/or chemical monitoring

	Rivers		Lakes		Coastal	
	Surv.	**Op**	**Surv.**	**Op**	**Surv.**	**Op**
second RBMP						
FI_VHA1	151	93	429	130		
FI_VHA2	124	165	318	201	15	78
FI_VHA3	82	220	156	191	61	113
FI_VHA4	71	77	149	69	6	12
FI_VHA5	22	21	32	13	6	3
FI_VHA6	14	11	17	7	1	3
FI_VHA7	17	4	11	2		
FI_WDA	0	0	14	14	4	18
Total by type of site	*481*	*591*	*1 126*	*627*	*93*	*227*
Total number of monitoring sites	*962*		*1648*		*281*	
first RBMP						
FI_VHA1	93	44	268	88		
FI_VHA2	56	77	152	86	6	18

	Rivers		Lakes		Coastal	
	Surv.	**Op**	**Surv.**	**Op**	**Surv.**	**Op**
FI_VHA3	28	31	51	38	28	39
FI_VHA4	24	31	30	28	2	6
FI_VHA5	23	16	36	12	4	4
FI_VHA6	16	7	19	5	2	3
FI_VHA7	22	4	20	0		
FI_WDA	0	0	14	14	2	12
Total by type of site	*262*	*210*	*590*	*271*	*44*	*82*
Total number of monitoring sites	*472*		*861*		*126*	

Sources: Member States electronic reporting to WISE

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



Source: WISE electronic reporting

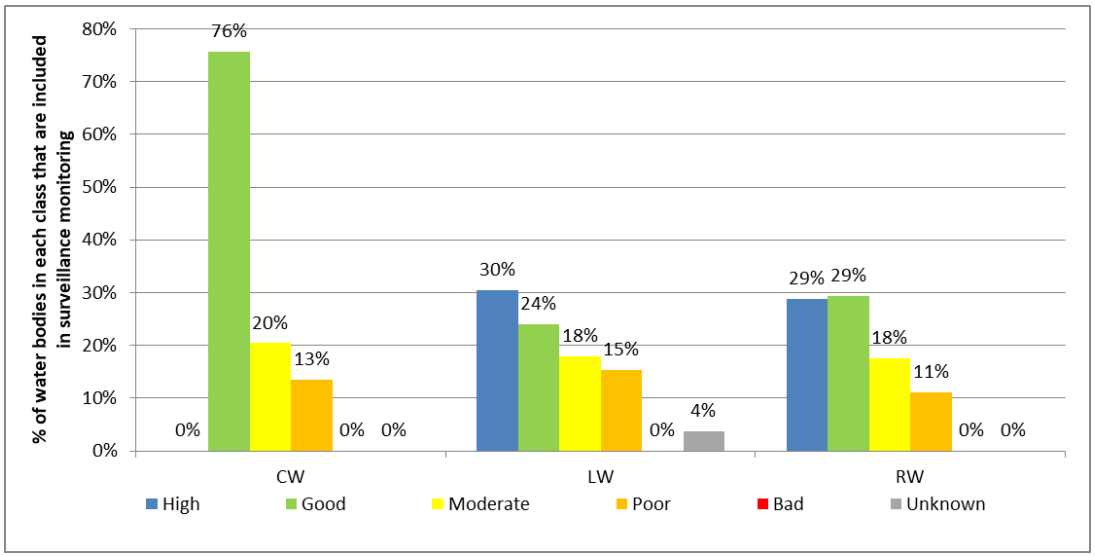
Overall there has been a 2.3 fold increase in the number of monitoring sites in Finland since the first RBMPs. Proportionally the largest increase was in coastal waters (2.8 fold), followed by rivers (2.4 fold) and lakes (2.1 fold). Generally there were increased numbers of sites in most RBDs though there were small decreases in lakes sites in three RBDs, and in coastal waters and rivers in one RBD.

In general there were more surveillance than operational sites in lakes in Finland whereas in rivers and coastal waters there were more operational than surveillance sites. At the national level there have been increases in the number of surveillance and operational sites in the three water categories for the second RBMPs compared to the first. At the RBD level, there were small decreases in the number of surveillance sites for the second RBMPs in some RBDs but much larger increases in some of the other RBDs. The numbers of operational sites increased in all RBDs and categories except for one RBD for coastal waters where there was no change and for another one where there was a decrease by one site.

Monitoring sites and monitored water bodies used for ecological status/potential

Figure 3.2 shows the proportion of water bodies subject to surveillance monitoring within each ecological status class.

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



Source: WISE electronic reporting

A differentiated presentation between ecological status and potential and including all types of quality element can be viewed here -

Overall there has been a significant change towards a science-based assessment of the ecological status. In the Kymijoki-Gulf of Finland RBMP it is stated that the focus of monitoring has changed. Previously mostly water samples were taken. Nowadays, more benthic invertebrates, macrophytes, phytoplankton and phytobenthos samples are taken, water vegetation is mapped and the structure of the fish population is investigated to determine the overall ecological status of the watercourses. New water bodies have been involved in the

typing, classification and monitoring of watercourses which have improved the regional coverage of monitoring. At the same time, the amount and density of sampling has been reduced in watercourses, which are already better known. Also in the Åland RBMP it is mentioned that more biological parameters are used in the monitoring than before.

Transboundary surface water body monitoring

Finland reported that eight monitoring sites in rivers or lakes were included in an international network of other international conventions and 16 were included in international network of a river convention including one lake site.

Quality elements monitored (excluding River Basin Specific Pollutants)

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

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

	Biological quality elements								
	Phytoplankton	Macrophytes	Phytobenthos	Benthic invertebrates	Fish	Angiosperms	Macroalgae	Other aquatic flora	Other species
Rivers	Yes[14]	Yes	Yes	Yes	Yes			Yes	
Lakes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	
Coastal	Yes	Yes		Yes		No	Yes	Yes	

	Hydromorphological quality elements		
	Hydrological or tidal regime	Continuity conditions	Morphological conditions
Rivers	Yes	No	No
Lakes	Yes		No
Coastal	No		No

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

[14] Finland subsequently informed that phytoplankton was not monitored or used in the classification of river in spite of being reported as being monitored in the electronic reports to WISE.

Source: WISE electronic reporting

For the second RBMPs phytoplankton was the biological quality element predominantly used in the surveillance monitoring of coastal waters (97 % of water bodies included in surveillance monitoring) and lakes (98 %). Macroalgae (52 % of water bodies) and benthic invertebrates (15 %) were used to a lesser extent in coastal waters, and benthic invertebrates (45 % of water bodies), fish (26 % of water bodies), macrophytes (21 % of water bodies) and phytobenthos (20 %) in lakes. For the surveillance monitoring of rivers, phytobenthos were predominantly used (73 % of water bodies included in surveillance monitoring), along with benthic invertebrates (60 %), fish (41 %), macrophytes (4 %) and phytoplankton (14 %).

The biological quality element predominantly used for surveillance monitoring for the first RBMPs in each water category was the same as those used for the second RBMPs. The other biological quality elements used were also the same but the proportion of water bodies monitored for some biological quality elements decreased for the second RBMPs compared to the first. For example, benthic invertebrates were monitored in 94 % of coastal water bodies included in surveillance monitoring for the first RBMPs compared to 15 % for the second: there were similar reductions in lakes and rivers. In addition, there was a reduction in the proportion of water bodies in surveillance monitoring where fish were monitored in lakes (-10 %) and rivers (-13 %).

Hydromorphological quality elements were not reported as monitored for surveillance purposes in coastal waters in Finland for the second RBMPs[15]. Morphological conditions were not monitored in lakes and rivers; river continuity was also not monitored and hydrological regime was monitored in rivers (13 % of water bodies in surveillance monitoring) and lakes (5 % of water bodies). This was also the situation for the first RBMPs.

General physicochemical quality elements were monitored to the same extent in each water category for the first and second RBMPs: generally over 95 % of water bodies included in surveillance monitoring were monitored.

Annex V of the WFD provide guidance on the frequency of monitoring of the different quality elements. Surveillance monitoring should be carried out for each monitoring site for a period of one year during the period covered by a RBMP i.e. six years. For phytoplankton this equated to twice during the monitoring year and the other biological quality elements once during the year.

All four biological quality elements monitored for surveillance purposes in coastal waters were sampled at the minimum frequency at all sites. There is also a very high rate of sites monitored

[15] Finland subsequently informed that hydromorphological quality elements were monitored in coastal waters even though this had not been reported in the Finland electronic reports to WISE.

at the minimum frequencies in lakes and rivers for all used biological quality elements: at least 94 % of sites were sampled at least at the minimum frequency.

There was also a relative high proportion of sites in all three water categories that were sampled at the minimum recommended frequency for the operational monitoring of the biological quality elements. The lowest rate of compliance was for phytoplankton: 50 % of sites in lakes, 66 % of sites in rivers and 88 % of sites in coastal waters.

River Basin Specific Pollutants and matrices monitored

Finland reported that nine different substances that are not Priority Substances were monitored as River Basin Specific Pollutants. These substances were monitored in water only.

River Basin Specific Pollutants were not monitored in coastal waters, they were monitored in lakes (in one water body included in surveillance monitoring) and in rivers (in 4 % of the water bodies included in surveillance monitoring).

Five substances were monitored in water in lakes (all in the Kokemäenjoki-Archipelago Sea-Bothnian Sea RBD): Metamitron, dimethoate, MCPA, bronopol and prochloraz.

Nine substances were monitored in water in rivers: Metamitron (three RBDs), Dimethoate (three RBDs), dibutylphthalate (three RBDs), Butyl benzyl phthalate (BBP) (four RBDs), MCPA (three RBDs), ethylenethiourea (ETU) (one RBD), tribenuron-methyl (one RBD), bronopol (three RBDs) and prochloraz (three RBDs).

The largest number of sites used to monitor these substances in Finland was 18 for five substances in rivers. The overall spatial coverage is low.

Inconsistent information has been reported on the monitoring frequencies. Finland subsequently clarified that there has been screenings with 8-12 samples per year in rivers, which is above the WFD recommended minimum frequency in water. No reliable information is available for lakes.

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

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

RBMP		Rivers	Lakes
1st	Sites used to monitor non-priority specific pollutants and/or other national pollutants	15	10
2nd	Sites used to monitor River Basin Specific Pollutants	20	1

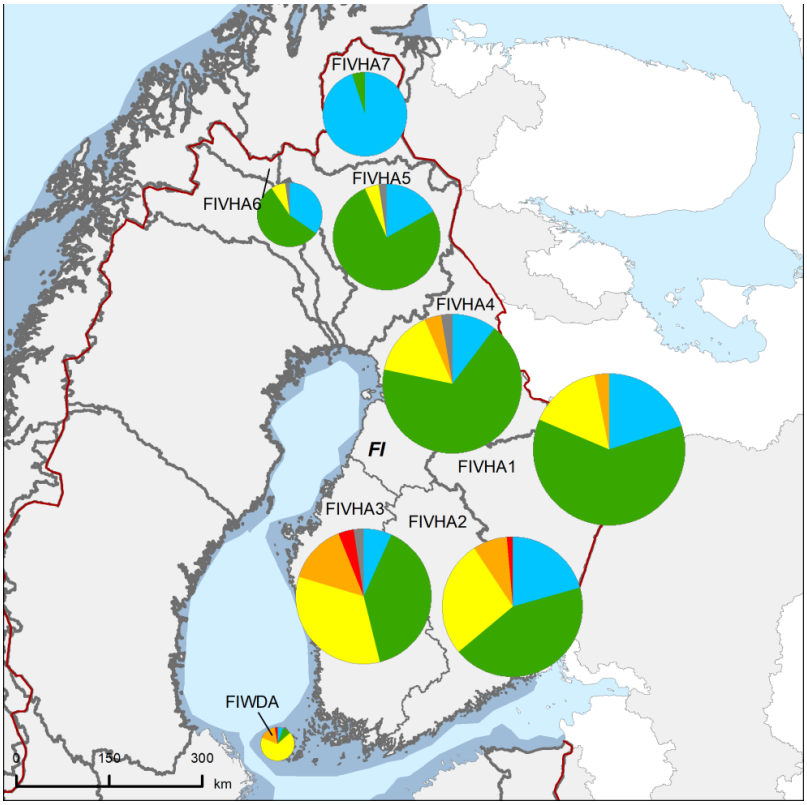
Source: WISE electronic reporting

3.1.2. Ecological Status/potential of surface water

The ecological status/potential of surface water bodies in Finland for the second RBMP is illustrated in Map 3.1. This is based on the most recent assessment of status.

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

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



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

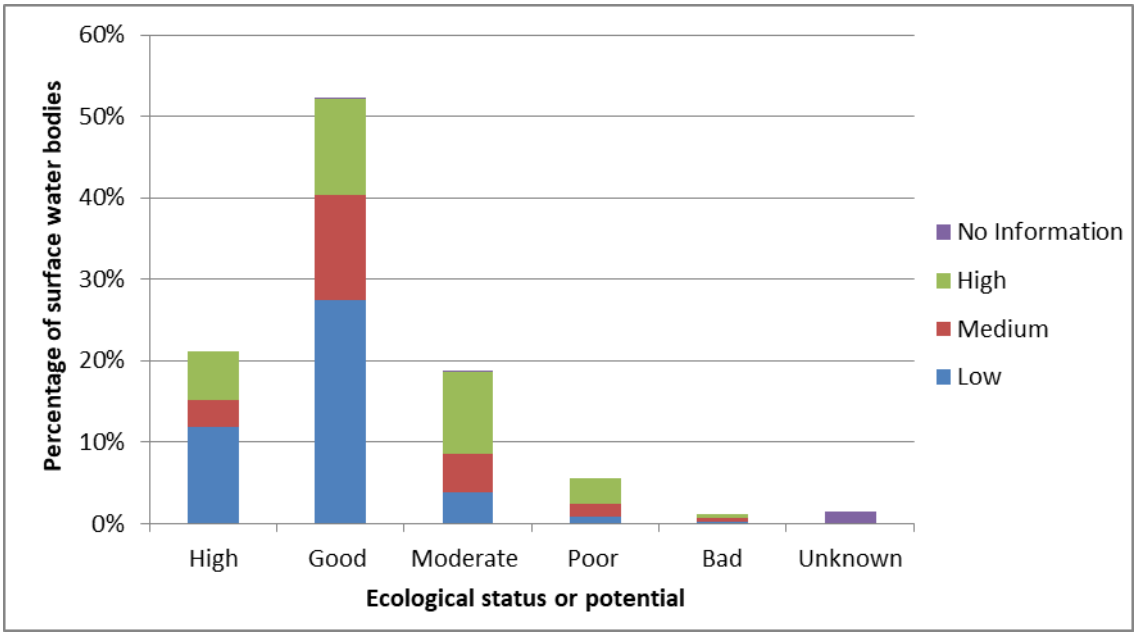
Source: WISE, Eurostat (country borders)

A differentiated presentation of this data between ecological status and potential and including all types of quality element can be viewed here -

Figure 3.3 shows the confidence in the classification of ecological status/potential. There has been a significant improvement in the confidence of the classification of ecological status/potential of surface water bodies since the first RBMPs. For the second RBMPs 31 % of surface water bodies were classified with high confidence compared to 3 % for the first, and 1

% of surface water bodies with no information on confidence for the second RBMPs compared to 52 % for the first.

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

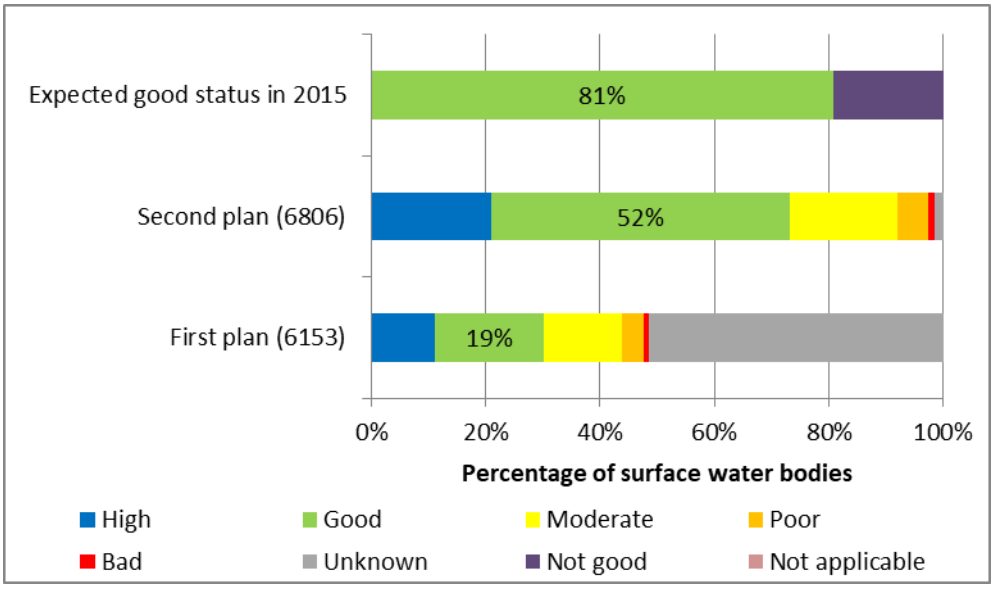


Source: WISE electronic reporting

Figure 3.4 compares the ecological status of surface water bodies in Finland for the first plan with that for the second plan (based on the most recent assessment of status/potential) and that expected by 2015). Overall ecological status has been reported for all delineated water bodies, which was not done for the first RBMPs, when only 50 % were classified. The confidence has improved compared to the first RBMPs, especially for rivers and lakes.

The overall ecological status has not improved significantly since the first RBMPs, and the status changes at the quality element level is not reported, due to lack of available data for the first RBMPs (Annex 0). This lack of data is hard to understand, as Finland has compiled a substantial amount of data for several biological quality elements during that first RBMPs in order to develop and intercalibrate the assessment methods. In the Åland RBD, the ecological status/potential in coastal waters and lakes is much worse than reported for the first RBMP, but this is probably due to changes in monitoring and assessment methods.

Figure 3.4 Ecological status or potential of surface water bodies in Finland for the second RBMPs, for the first RBMPs and expected in 2015. The number in the parenthesis is the number of surface water bodies for both cycles. Note the period of the assessment of status for the second RBMPs was 2006 to 2013. The year of the assessment of status for the first RBMPs is not known

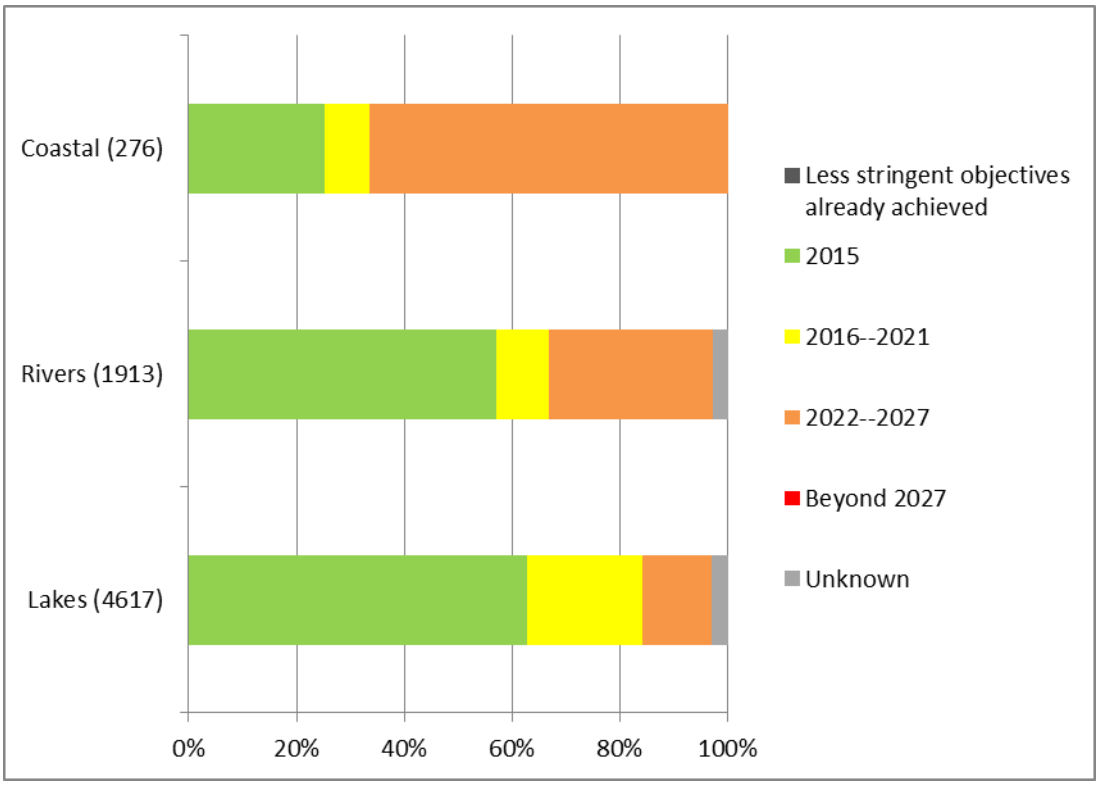


Source: WISE electronic reporting

According to the Kymijoki-Gulf of Finland RBMP the ecological status of surface water bodies has generally remained the same in comparison to the previous classification. In most of the cases, changes in class are caused by methodological changes, new monitoring data and changes in the typology. In the Åland RBD, the ecological status of coastal water bodies (measured by chlorophyll a) has improved in three areas and deteriorated in five areas. The changes are considered to be mainly caused by the general state of the Baltic Sea. The chlorophyll levels increased in all reported lakes. Changes cannot be assessed using more parameters since the data from the first RBMPs is missing.

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

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



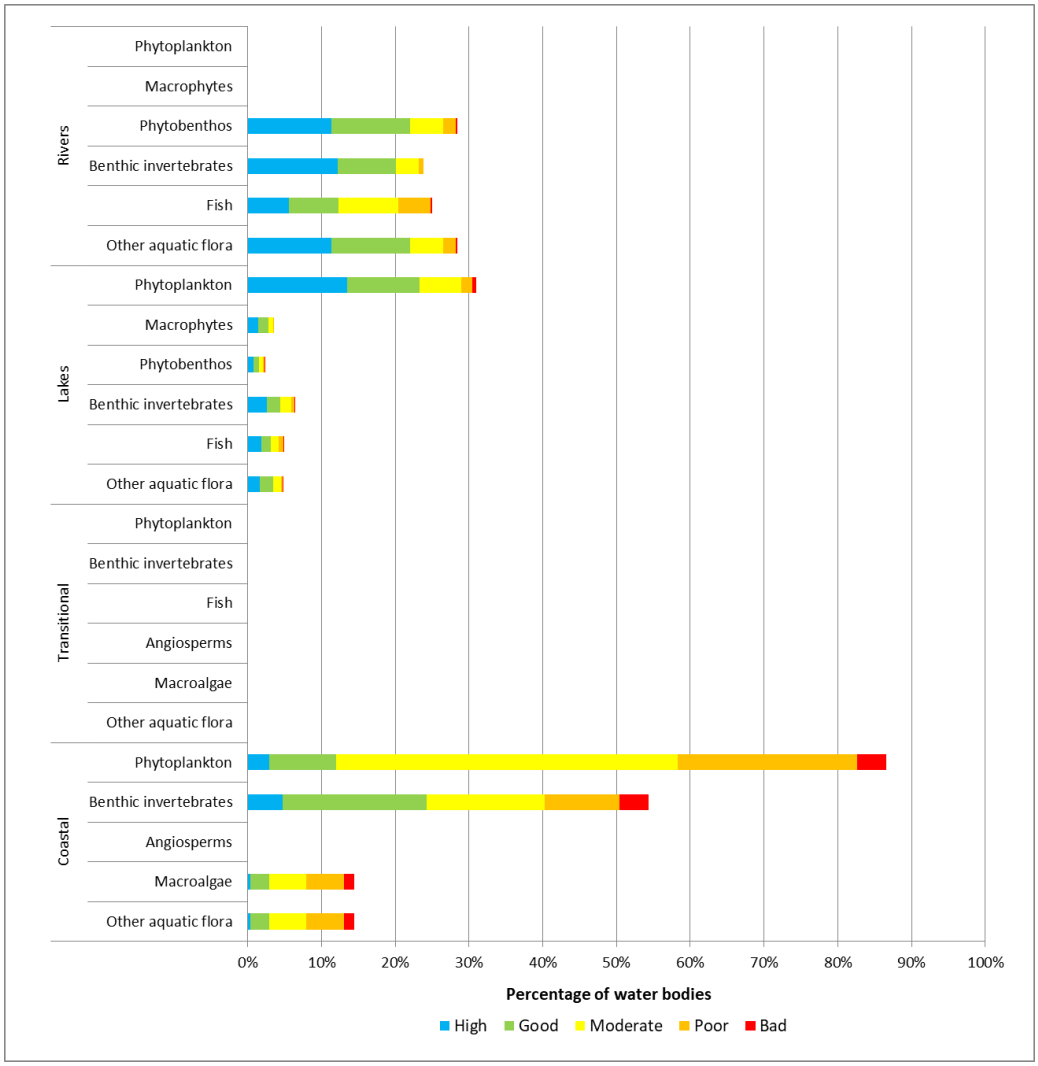
Source: WISE electronic reporting

Classification of ecological status in terms of each classified quality element

Figure 3.6 shows the ecological status/potential of water bodies for each biological quality elements used in the classification of surface water bodies.

Figure 3.6 Ecological status/potential of the biological quality elements used in the classification of surface waters in Finland

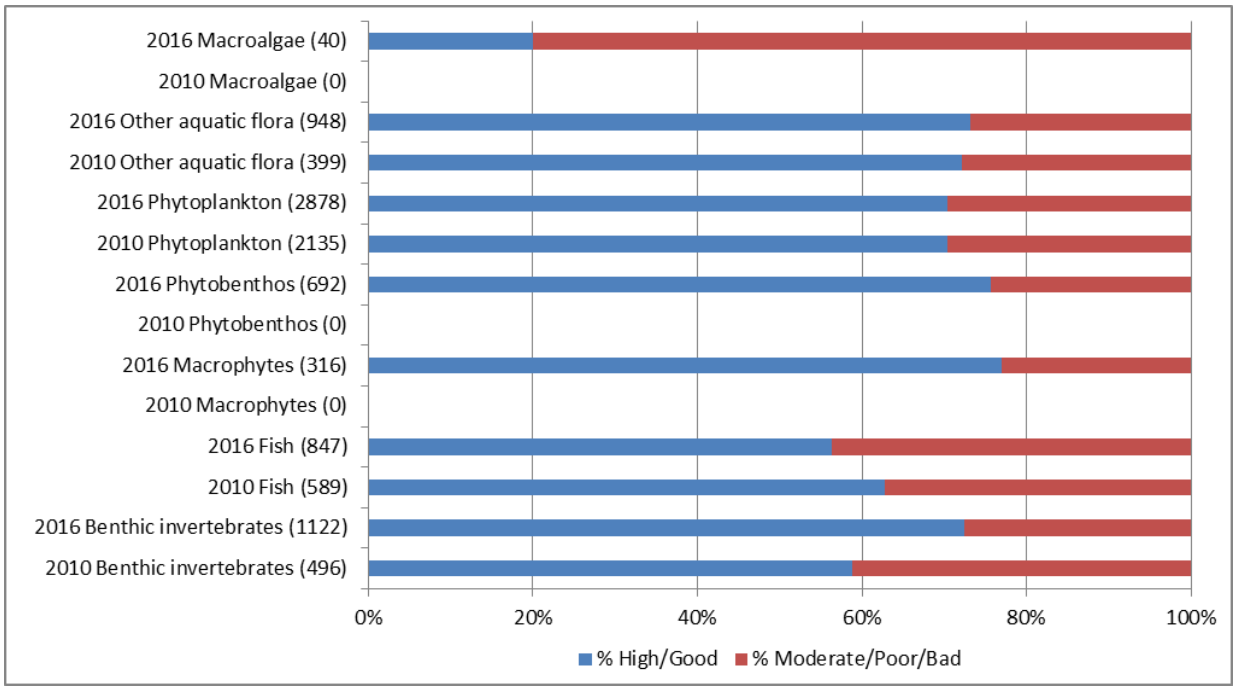
Note that water bodies with unknown status/potential have been excluded from the presentation



Source: WISE electronic reporting. A differentiated presentation of this data between ecological status and potential and including all types of quality element can be viewed here

Figure 3.7 compares the classification of biological quality elements in terms of ecological status/potential for the two cycles. It should be noted that this comparison should be treated with some caution as there are differences between the numbers of surface water bodies classified for individual elements from the first to the second RBMPs.

Figure 3.7 Comparison of ecological status/potential in Finland according to classified biological quality elements in rivers and lakes from the first to the second RBMPs. Note the number in brackets is the number of surface water bodies with status

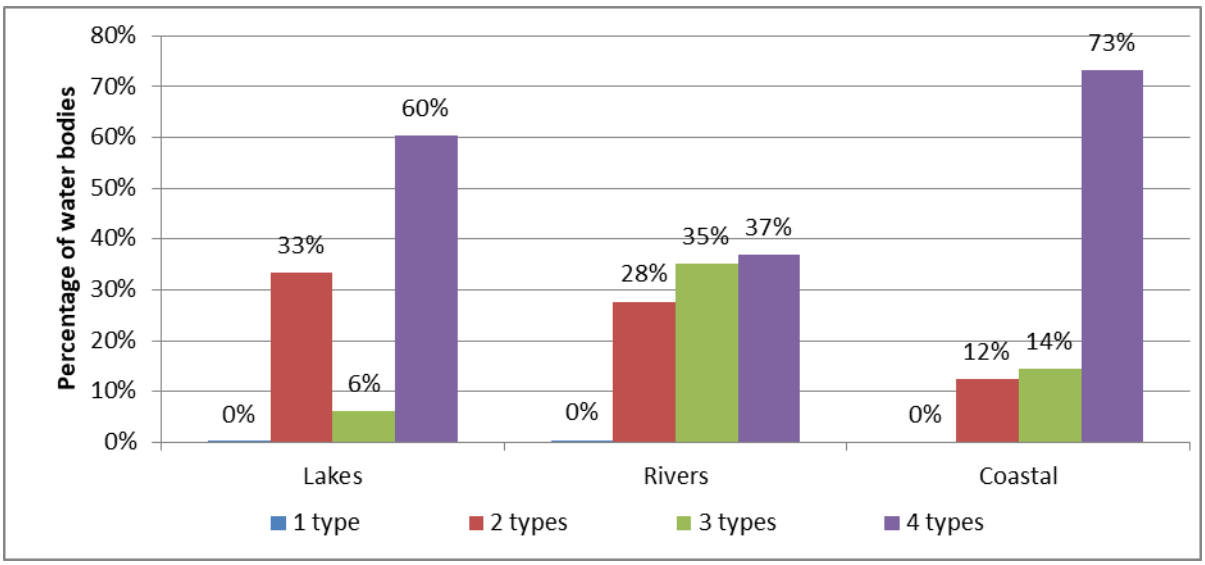


Source: Surface water bodies: Quality element status

Figure 3.8 and Figure 3.9 illustrate the basis of the classification of ecological status/potential of rivers and lakes in Finland for the second RBMP. The classification is more often based on several quality elements in all water categories and on more than had been used for the first RBMPs, although for many water bodies in lakes and coastal waters, the assessment is still based on phytoplankton and nutrients only. The nutrient quality elements are reported as not being monitored, or assessed in coastal waters in the Åland RBD. Finland subsequently clarified that there is monitoring in more than 100 sites in coastal waters of the Åland RBD. The results of monitoring are used for classification. This information is contrary to the information reported electronically to WISE for this RBD.

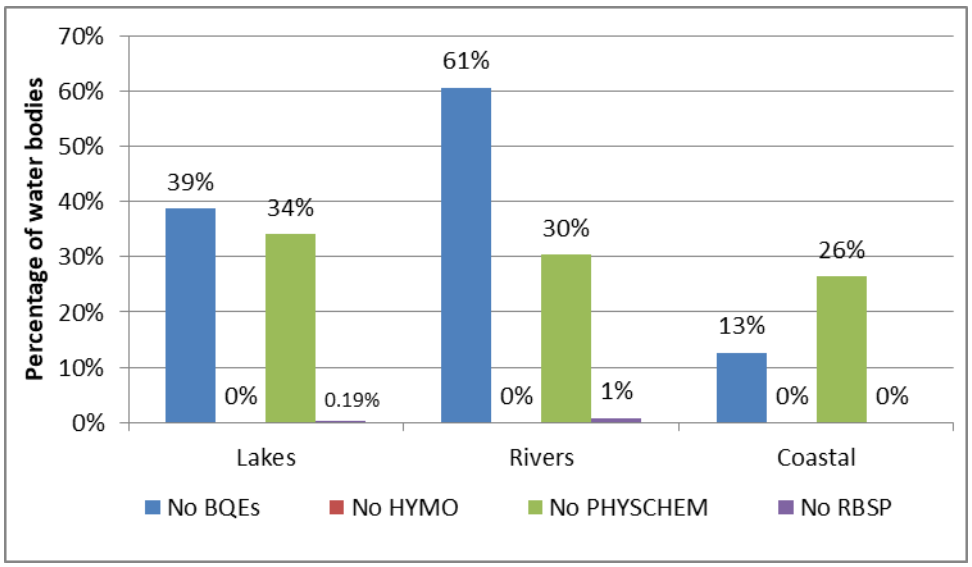
Figure 3.8 The classification of the ecological status or potential of surface waters in Finland using 1, 2, 3 or 4 types of quality element

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



Source: WISE electronic reporting

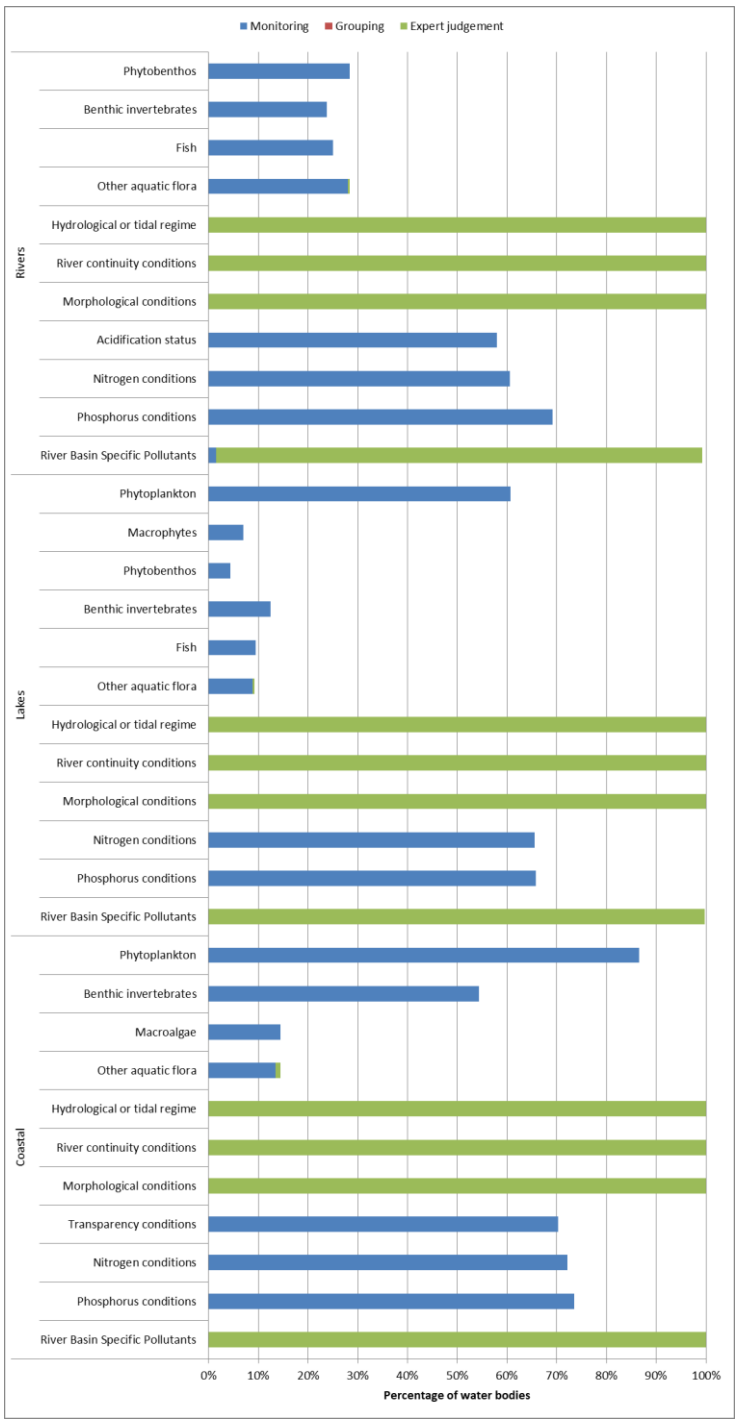
Figure 3.9 The percentage of surface water bodies in Finland where no biological quality element or no hydromorphological (HYMO) or no general physicochemical (PHYSCHEM) or no River Basin Specific Pollutant (RBSP) has been used in the classification of ecological status or potential



Source: WISE electronic reporting

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

Figure 3.10 Basis of the classification of ecological status/potential in Finland. The percentages are in terms of all waterbodies in each category. [16]



Source: WISE electronic reporting

[16] Finland subsequently explained that migratory barriers in the mouth of a river system or in the outlet of a lake inside a river system have been considered as part of river continuity when they affect the migratory species of the respective river system. Continuity has been used in the classification of coastal waters and lakes as well as rivers.

There is very little change in ecological status since the first RBMPs, and quality element level change is not reported due to lack of comparable data for the first RBMPs (Annex 0 justification). The ecological status in coastal waters is still less than good for all water bodies in the Kymijoki-Gulf of Finland RBD and for 93 % of water bodies in the Åland RBD, which is a deterioration compared to the first RBMPs as 68 % were less than good. For rivers in the Kymijoki-Gulf of Finland RBD, the proportion less than good is 53 %, which is almost the same as for the first RBMPs. (No rivers are delineated in the Åland RBD). For lakes, the proportion less than good is now 26 % in the Kymijoki-Gulf of Finland RBD, which is a slight improvement from 31 % less than good for the first RBMP, while in the Åland RBD the proportion less than good is higher for the second RBMP (57 %) than for the first, when all the lakes were reported to be in high or good ecological status. The reason for the negative changes is probably a change of methods from expert judgement for the first RBMPs to monitoring for the second.

Use of monitoring results for classification

The majority of water bodies was reported to be classified based on monitoring at quality element level. Of the hydromorphological quality elements, hydrological regime is the only element monitored in rivers and lakes: all elements are used in classification only on the basis of expert judgement.

Finland reported that the grouping of water bodies has been used in extrapolating the assessment and classification of ecological status from monitored water bodies to those water bodies with no monitoring sites. However, this is not consistent with the information reported on the means of classification of quality elements where grouping was reported not to be used.

For the first and the second RBMPs, no water bodies were reported as being directly monitored for morphological quality elements, and close to zero monitoring of River Basin Specific Pollutants were reported. However, all those quality elements have been classified for all water bodies in all water categories (based on expert judgement), and all water bodies were classified in good status for the River Basin Specific Pollutants. River continuity is reported as being classified for rivers, coastal waters and for lakes[17]. Hydromorphological quality elements are used for classification, but no reference conditions have been established and they are not linked to the biological quality elements. The basis for classification of both

[17] Finland subsequently explained that migratory barriers in a river system or in the outlet of a lake inside a river system have been considered as part of river continuity when they affect the migratory species of the respective river system.

hydromorphological quality elements and River Basin Specific Pollutants seems to be unreliable.

For general physicochemical quality elements, the classification is based only on expert judgement in the Åland RBD for total nitrogen and total phosphorus. No general physicochemical standards have been reported for this RBD. In the Kymijoki-Gulf of Finland RBD, many parameters were monitored, but not used for classification (oxygen in all water categories, transparency in lakes, acidification parameters in lakes, thermal conditions and salinity conditions). It is not clear whether the data will be used for development of assessment methods or for other purposes.

Assessment methods and classification of biological quality elements

There are now assessment methods developed for all relevant biological quality elements, including angiosperms in coastal waters, macrophytes in rivers and phytobenthos in lakes, which were missing for the first RBMPs. However, the method for macrophytes in rivers is not reported in the electronic report to WISE, probably due to very recent completion and intercalibration of the method.

The assessment methods were reported to be sensitive to most reported significant impacts, the exception being for chemical pollution and acidification in coastal waters.

Intercalibration of biological assessment methods and national classification systems

Many Finnish water body types are linked to the common intercalibration types, but it is not clear which biological quality element methods have been intercalibrated, and how the class boundaries have been set for national types not linked to the common intercalibration types. For example, none of the three national types for coastal waters in the Åland RBD are linked to any common intercalibration type, although the methods used are the same that were intercalibrated for Sweden and Finland.

Assessment methods for hydromorphological quality elements

All the relevant hydromorphological quality elements were reported to be assessed in terms of ecological status/potential in rivers, lakes and coastal waters but the classification boundaries are not related to the class boundaries for the sensitive biological quality elements. There are no reference conditions reported for hydromorphological quality elements in any water category.

Hydromorphological quality elements are nevertheless used for assessment of ecological status based on expert judgement: the basis for this expert judgement is not clear[18].

The second RBMPs were examined for information on the major changes between the first and second RBMPs in the assessment methodologies for the hydromorphological quality elements. For rivers and lakes the approach is the same, but more care is taken that a detailed assessment is carried out for all water bodies where hydromorphological aspects are identified as a significant factor deteriorating the quality of the water body. For coastal waters, also similar approach is used as during the first RBMPs but more care is taken to include expert views and the views of different stakeholders when the significance of the effects is assessed. The methodology is the same in all RBMPs.

Assessment methods for general physicochemical quality elements

Only a limited number of general physicochemical quality elements were used in the assessment of ecological status/potential of surface water bodies: nutrient conditions in all three water categories, transparency in coastal waters and acidification status in rivers. There are therefore significant gaps in the elements required to be assessed in all categories.

Type-specific standards were reported for nutrients in all water categories in many types of water bodies, acidification parameters in rivers and secchi depth in coastal waters, and all are reported as being compatible with the good-moderate status/potential boundaries for sensitive biological quality elements. Standards are not developed for oxygen in any water category, or for secchi depth in lakes, but these quality elements were monitored.

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

There is no information on how the River Basin Specific Pollutants have been identified in the second RBMPs[19]. No metal has been identified as River Basin Specific Pollutants.

Finland reported nine different River Basin Specific Pollutants that are monitored and 13 different River Basin Specific Pollutants for which Environmental Quality Standards have been set. Environmental Quality Standards have been set for all substances monitored. It is not

[18] Finland subsequently stated that expert judgement is based on existing reports, field measurements, databases and map investigations for most of the quality elements in large water bodies.

[19] Finland subsequently clarified that there were no changes since the first RBMPs. The selection of River Basin Specific Pollutants was reported for the first RBMPs according to rules that are outlined in the following documents:

- Londesborough, S. 2003 Proposal for a Selection of National Priority Substances. Finnish Environment 622.
- Londesborough, S. 2005 Proposal for Environmental Water Quality Standards in Finland. Finnish Environment 749

clear whether and how the substances not monitored were taken into account in the assessment of status.

13 Environmental Quality Standards apply to coastal waters though none was reported to be monitored in coastal waters. There were Environmental Quality Standards for 12 substances in rivers and for 13 substances in lakes.

12 Environmental Quality Standards were reported in water, one in sediment (for 3, 5-dimethyl-phenol, although this substance is not reported as monitored). The standards have not been derived in accordance with the 2011 Technical Guidance Document No 27[20].

The analytical methods used for the substances meet the minimum performance criteria laid down in Article 4(1) of Directive 2009/90/EC[21] for the strictest standard applied in river and lakes. However, for four substances in coastal water the analytical method does not meet the minimum performance criteria laid down in Article 4(1), but does comply with the requirements laid down in Article 4(2) for the strictest standard applied.

River Basin Specific Pollutants are classified mainly using expert judgement, only a few water bodies are classified based on monitoring results. It is not clear on what information this expert judgment was based. All water bodies were reported to be in good status for River Basin Specific Pollutants. However it should be highlighted that the spatial coverage of monitoring is low, and environmental quality standards were not set according to the Technical Guidance Document, which reduces the reliability of the assessment.

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

The one-out, all-out principle has been used in all RBDs. It is not clear how the change in combination rules from the weight-of-evidence approach used for the first RBMPs to the one-out-all-out approach for the second RBMPs affects the comparability of ecological status assessment. There is no information available on how the no-deterioration principle has been applied, nor on how they deal with spatial variability within water bodies.

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

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

3.2 Main changes in implementation and compliance since the first RBMPs

Overall there has been a 2.3 fold increase in the number of monitoring sites in Finland since the first RBMPs. Proportionally the largest increase was in coastal waters (2.8 fold), followed by rivers (2.4 fold) and lakes (2.1 fold): Finland did not identify any transitional water bodies. Generally there were increased numbers of sites in most RBDs though there were small decrease in lakes sites in three RBDs, and in coastal waters and rivers in one RBD.

For Finland as a whole, for the second RBMPs around 20 % of water bodies in coastal waters, lakes and rivers were included in surveillance monitoring. This was an increase from the first RBMPs where 11 % to 15 % of water bodies were included in surveillance monitoring.

The biological quality element predominantly used for surveillance monitoring for the first RBMPs in each water category was the same as those used for the second. The other biological quality elements used were also the same but the proportion of water bodies monitored for some biological quality elements decreased for the second RBMPs compared to the first. For example, benthic invertebrates were monitored in 94 % of coastal water bodies included in surveillance monitoring for the first RBMPs compared to 15 % for the second: there were similar reductions in lakes and rivers. In addition, there was a reduction in the proportion of water bodies in surveillance monitoring where fish were monitored in lakes (-10 %) and rivers (-13 %).

Ecological status has deteriorated for lakes and coastal waters in the Åland RBD, probably due to improved monitoring and assessment methods. Lakes in the Åland RBD are assessed with more biological quality elements / quality elements for the second RBMP than for the first.

The proportion of surface water bodies of unknown status/potential has decreased from 50 % to 2 %. The confidence the classification has also improved.

The classification is based on more comprehensive methods that consider more of the relevant biological quality elements, all hydromorphological quality elements (although not all are relevant) and some physicochemical quality elements (mainly nutrients).

The gaps in the biological quality element methods highlighted from the assessment of the first RBMPs have now been covered, although some very recently, so not reported electronically to WISE. Physicochemical standards have been reported for nutrients for specific types and are related to the good-moderate status/potential boundaries for the sensitive biological quality elements. Hydromorphological quality elements are used for classification, but are reported not to be monitored.

The one-out, all-out principle has been used for the second RBMPs, in contrast to the first.

3.3 Progress with Commission recommendations

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

- Recommendation 8: *There is a large proportion of surface water bodies in Finland for which the status is unknown. Some RBDs have a high proportion of water bodies for which status is unknown. Finland therefore needs to increase its efforts in this first cycle to decrease this lack of knowledge and uncertainty. Some recommendations below are crucial to ensure this improvement. Finland needs to improve the surface water monitoring and the quality of the reporting of monitoring networks, methodologies and results, and to extend the monitoring programmes to cover all water bodies (including smaller water bodies) and all required quality elements.*

  Assessment: A large percentage of surface water bodies have been reported as having unknown status/potential in the first RBMP (52.8 % of 6153 surface water bodies). For the second RBMPs this was reduced to 1.4 % of the 6806 surface water bodies. Significant progress has therefore been made.

  Some required quality elements were not monitored (e.g. morphological conditions, macrophytes in rivers etc.). Considering hydromorphology only in operational monitoring programmes (as was in 2013) and not in surveillance ones is not consistent with the WFD.

  Macrophytes in rivers are only monitored in around 1 % of river water bodies. Morphological conditions are not included in surveillance monitoring. There has been very limited progress on this aspect.

  The number of small water bodies (less than 0.5 km²) monitored in the second RBMPs has increased since the first RBMPs. For coastal water bodies, 1 of the 5 water bodies which are smaller than 0.5 km² is monitored in the second RBMPs, compared to none in the first. For lakes, the proportion of small water bodies monitored increased from 4 % of the total number of monitored lakes to 6 %. For rivers, the number of small water bodies monitored increased from 2 to 17 Therefore, regarding the number of small water bodies monitored, there has been progress from the first to the second RBMPs.

A significant proportion of surface water bodies included in surveillance monitoring were not monitored for all required biological quality elements. There is still a predominant focus on the monitoring of phytoplankton in coastal waters and lakes, and on the physicochemical quality elements in all water categories. There has been some progress on this aspect but there are still important gaps on this issue.

Some of the biological quality element methods missing for the first RBMPs have now been developed. The following new biological quality element methods have been developed: rivers macrophytes, lakes phytobenthos and coastal waters angiosperms. The sensitivity to impacts has been reported for each biological quality element though there are gaps for two impact types in coastal waters.

In conclusion, the recommendation has been partially fulfilled.

- Recommendation 9: *Finland needs to base its classification on such extended monitoring results. The ecological status assessments are based primarily on expert judgement but not on WFD compliant methods, and there is a significant shortcoming in the availability of data for classification.*

  Assessment: The results of monitoring have been overwhelmingly used for the classification of biological and physicochemical quality element with expert judgment only being used in a very few cases. However, the hydromorphological quality elements have been exclusively classified by expert judgment. Hydrological regime is monitored in rivers and lakes, but morphological quality elements and river continuity are not monitored in any water category. The recommendation has been partially fulfilled because of the lack of monitoring of, and the use of expert judgement for the classification of, hydromorphological quality elements.

- Recommendation 10: *The identification of River Basin Specific Pollutants needs to be more transparent, with clear information of how pollutants were selected, how and where they were monitored, and where there are exceedances and how such exceedances have been taken into account in the assessment of ecological status.*

  Assessment: It is not clear how River Basin Specific Pollutants have been identified. (However Finland reported that the CIS Guidance Document n°27 was not used to derive the Environmental Quality Standards). Finland has provided detailed information on how and where the substances are monitored. It is important to note that River Basin Specific Pollutants were not monitored in coastal waters, and the spatial coverage of monitoring for lakes and rivers is low. Overall nine River Basin Specific

were reported to be monitored (only in water) while standards were reported for 13 substances: it is not clear whether and how the substances not monitored were taken into account in the assessment of status. Information reported on monitoring frequencies is inconsistent, but Finland subsequently clarified that the monitoring frequencies in rivers are higher than the minimum recommended frequency. No reliable information is available on monitoring frequencies in lakes. No failures of good ecological status/potential were reported for River Basin Specific Pollutants. The one-out-all-out has been applied to assess ecological status. In most cases, the status of river basin specific Pollutants has been determined based on expert judgment, and no information is available on the basis for this expert judgment. In conclusion, the recommendation has been partially fulfilled.

- Recommendation 11: *Provide more information about the threshold values/standards that have been set to support good status, not only for surface waters, but also for groundwater, including coastal waters.*

  Assessment: The Commission advised Finland to set out the calculations they have made of the nitrate and phosphate loading from agriculture that needs to be reduced in order to allow for nutrient conditions in water bodies that would be consistent with the achievement of good status.

  Finland reported standards for total nitrogen and total phosphorus in rivers, lakes and coastal waters, and are related to the good-moderate boundary of the sensitive biological quality element i.e. support good status. Finland did not report the loads of phosphorus and nitrogen that need to be reduced to achieve WFD objectives[22]. On this basis the recommendation has been partially fulfilled.

[22] Finland subsequently stated that this information was not reported in WISE but was included in the reports.

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

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

4.1.1. Monitoring of chemical status in surface waters

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

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

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

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

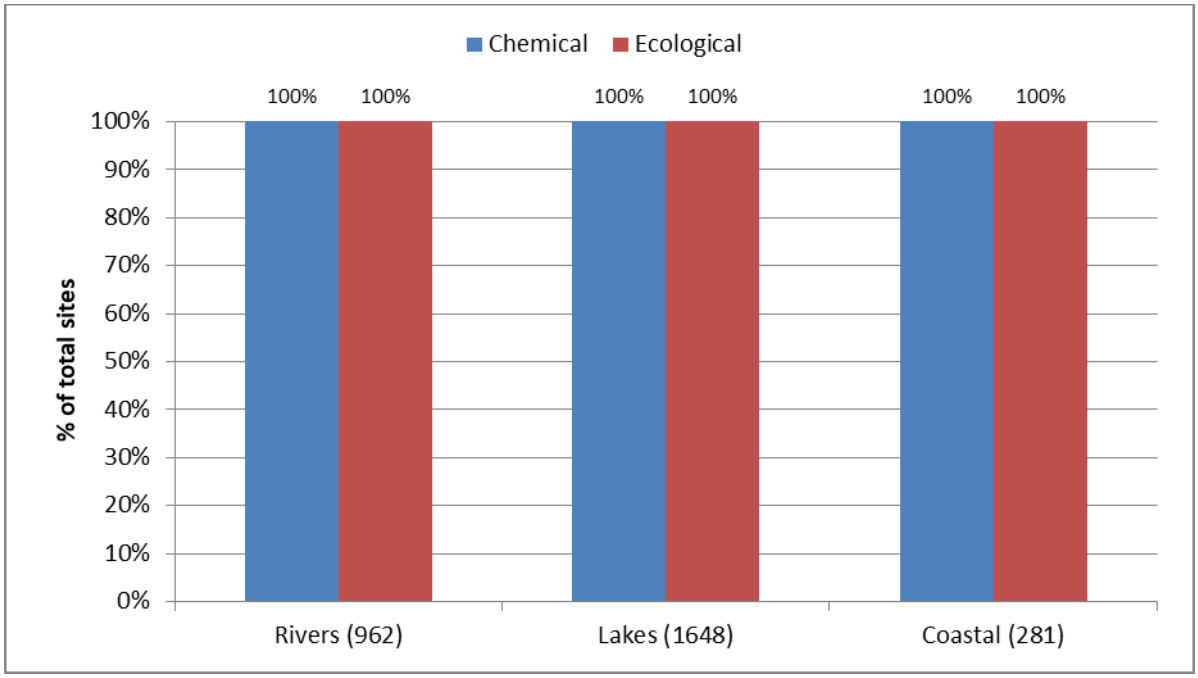
Figure 4.1 summarises the proportion of sites used for the monitoring of chemical status in rivers, lakes and coastal waters for the second RBMP (territorial waters are not monitored and their chemical status is not assessed). In this figure, no distinction is made between sites used for surveillance and/or operational purposes. More detailed information can be found on the website of the European Environment Agency[23].

Figure 4.1 shows that all sites are used for the monitoring of chemical and ecological status. However, Finland provided additional information stating that there has been a reporting error and in fact not all monitoring sites are used for monitoring of chemical status. Finland also stated that data is rarely available compared with the large number of waterbodies.

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

For the second RBMP, for surface water bodies across all RBDs in Finland, there are a similar proportion of sites monitored for Priority Substances under surveillance monitoring and operational monitoring (11 % and 10 % respectively).

Figure 4.1 ***Proportion of sites used for monitoring of chemical status and, for comparison, ecological status, in Finland. The number in parenthesis next to the category is the total number of monitoring sites irrespective of their purpose[24]***



Source: WISE electronic reporting - Finland subsequently clarified that there has been a reporting error and that not all monitoring sites are used for monitoring of chemical status.

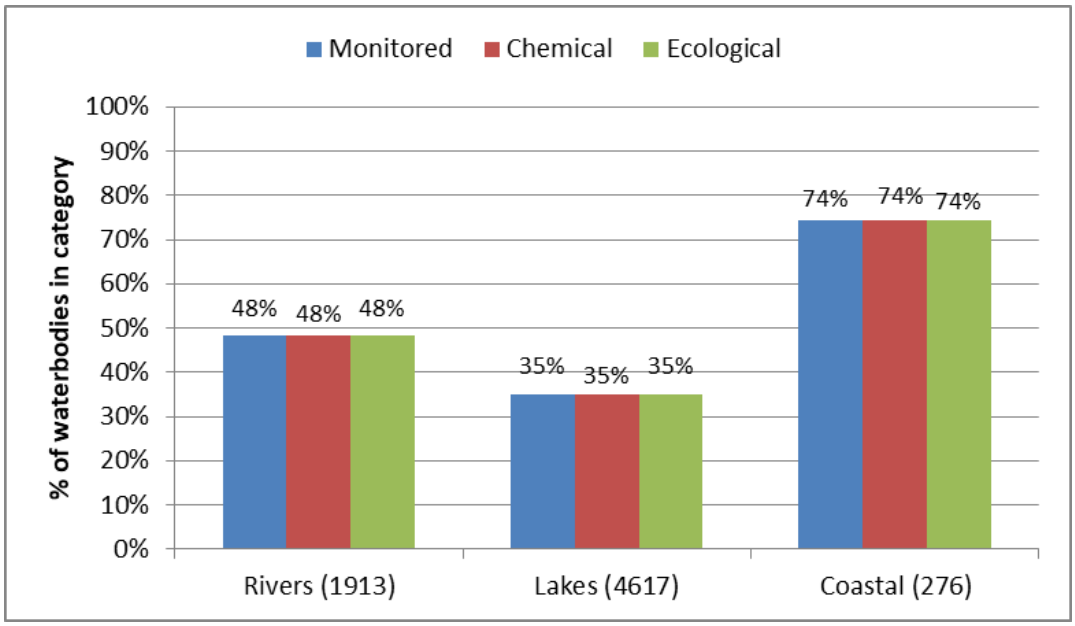
Figure 4.2 summarises the proportion of water bodies monitored for chemical status in lakes and rivers for the second RBMP. In this figure, no distinction is made between water bodies monitored for surveillance and/or operational purposes. Also given is the proportion of water bodies monitored for any purpose and, for comparative purpose, those for ecological status.

In Finland overall, 48 % of river water bodies, 35 % of lake water bodies and 74 % of coastal water bodies were monitored for chemical status.

[24] Finland subsequently clarified that there has been a reporting error and that not all monitoring sites are used for monitoring of chemical status.

In most RBDs in Finland, there is a small number of surface water bodies failing to achieve good chemical status being monitored as part of the operational monitoring programme for chemical status i.e. on average 4.5 % . However, a higher percentage of water bodies failing to achieve good chemical status are monitored in the following RBDs: Kemijoki (100 %), Kokemäenjoki-Archipelago Sea-Bothnian Sea (50 % of coastal waters and 13 % of rivers), Kymijoki-Gulf of Finland (33 % of coastal waters). All of the surface water bodies in the Tornionjoki, Teno, Näätämöjoki and Paatsjoki and Åland RBDs were reported to be at good status.

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



Source: WISE electronic reporting

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

Monitoring for status assessment

Requirements

Article 8.1 of the WFD requires Member States to establish monitoring programmes in order to provide inter alia a coherent and comprehensive overview of water status within each RBD. The amount of monitoring undertaken in terms of priority substances, frequency and numbers

of sites should be sufficient to obtain a reliable and robust assessment of status. According to the EQS Directive (version in force in 2009), mercury, hexachlorobenzene and hexachlorobutadiene have to be monitored in biota for status assessment, unless Member States derived a standard for another matrix, which is at least as protective as the biota standard.

Spatial coverage

According to WISE, a large number of coastal waters in Finland were not monitored for any Priority Substances: 100 % in the Tornionjoki and Åland RBDs, 92 % for the Kokemäenjoki-Archipelago Sea-Bothnian Sea RBD and between 78 % and 80 % for the Kymijoki-Gulf of Finland, Oulujoki-Iijoki and Kemijoki RBDs. The remaining coastal water bodies in these RBDs were monitored for between one and five Priority Substances. The Åland RBD however subsequently clarified that priority substances are monitored in coastal waters, in water, sediment and biota.

There are also large numbers of lake waters with no monitoring for Priority Substances across all the RBDs. The monitoring sites for lake water bodies are predominantly monitored for only one Priority Substance. Similarly, for river water bodies across seven RBDs, between 90 and 99 % are not monitored for Priority Substances. 2 % of river waters in Kokemäenjoki-Archipelago Sea-Bothnian Sea were monitored for more than 10 Priority Substances. The remaining river waters were monitored for between 1 and 10 Priority Substances.

In WISE, only mercury is reported to be monitored in biota for status assessment with hexachlorobenzene and hexachlorobutadiene being monitored in water. There is no information available to confirm whether the water environmental quality standard is at least as protective as the biota standard. However, Finland subsequently clarified that mercury, hexachlorobenzene and hexachlorobutadiene were monitored in biota for status assessment (hexachlorobenzene and hexachlorobutadiene being also monitored in water according to WISE reporting).

Frequencies

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

Monitoring frequencies in water were reported in WISE for 26 Priority Substances at the site level in the Kymijoki-Gulf of Finland RBD and for 22, 21, 12 and four substances in the Kokemäenjoki-Archipelago Sea-Bothnian Sea, Oulujoki-Iijoki, Vuoksi and Tornionjoki RBDs respectively. The monitoring frequency in both water and biota was once per year and every three years in the monitoring cycle for each monitoring site within each of the seven RBDs. These reported frequencies do not meet the guidelines for operational or surveillance monitoring in water or biota for status assessment in the Directive. The RBMPs provide no specific information on frequencies. No explanation was provided for the reduced frequency.

Monitoring for long-term trend assessment

Requirements

Article 3.3 of the EQS Directive (version in force in 2009) requires Member States to monitor 14 priority substances[25] that tend to accumulate in sediment and/or biota, for the purpose of long-term trend assessment. Monitoring should take place at least once every three years, unless technical knowledge and expert judgment justify another interval.

Spatial coverage and frequencies

There is no monitoring reported in Finland for long-term trend analysis in sediment and/or biota. Finland has provided additional information stating that they will be monitoring ubiquitous persistent, bioaccumulative and toxic substances in fish (although it is not totally clear whether this will be part of a trend assessment), and that they are also considering monitoring sediment in undisturbed lakes.

Monitoring of Priority Substances that are discharged in each RBD

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

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

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

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

Finland reported that 36 substances were included in an inventory for each of the RBDs. (See section 2.1.11 of this report for further information). However, not all the substances were reported to be discharged. Across the eight RBDs in Finland only between three and eight of the Priority Substances in an inventory were reported as being discharged. For seven of the eight RBDs, with the exception of DEHP in the Oulujoki-Iijoki RBD, all of the substances discharged were reported to be monitored. In the Åland RBD 3 substances were reported as being discharged but none were monitored (although a reporting error with regard to monitoring is suspected[26]).

Performance of analytical methods used

According to WISE for 25 groups of Priority Substances the analytical methods used meet the minimum performance criteria laid down in Article 4(1) of Directive 2009/90/EC[27] for the strictest standard applied. For the remaining 16 reported, Finland reported that the analytical methods complied with the requirements laid down in Article 4(2) of Directive 2009/90/EC for the strictest standard applied.

The method of dealing with measurements of Priority Substances lower than the limit of quantification was as specified in Article 5 of Directive 2009/90/EC.

4.1.2. Chemical Status of surface water bodies

Member States are required to report the year on which the assessment of chemical status was based. This may be the year the surface water body was monitored. In case of grouping this may be the year in which monitoring took place in the surface water bodies within a group that are used to extrapolate results to non-monitored surface water bodies within the same group. For Finland, the assessment of chemical status was undertaken between 2010 and 2014.

[26] Finland subsequently clarified that in the Åland RBD monitoring is undertaken for Priority Substances and that lists are available of the substances monitored. They state that they have monitored in water, in sediments and in biota (fish and mussels). See for example report: http://www.regeringen.ax/nyheter/analys-fiskmuskel-fisklever-fran-gos-alands-landskapsregering

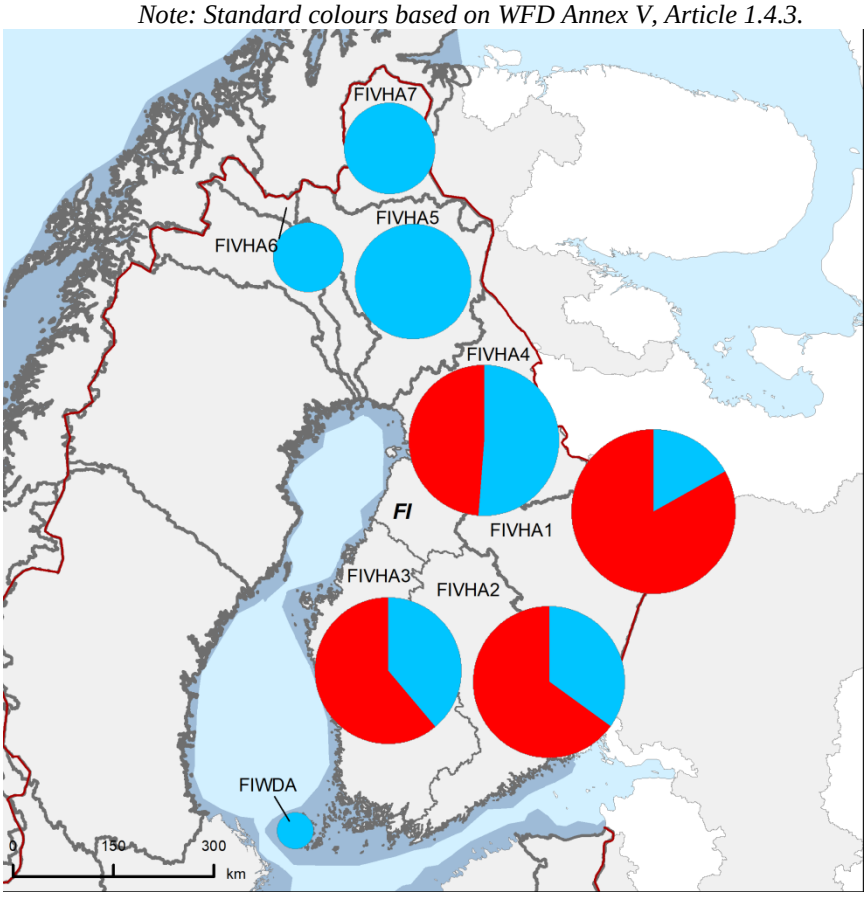
[27] Directive 2009/90/EC of 31 July 2009 laying down, pursuant to Directive 2000/60/EC of the European Parliament and of the Council, technical specifications for chemical analysis and monitoring of water status http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1524565750309&uri=CELEX:32009L0090

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

The chemical status of surface waters in Finland for the first and second RBMPs is given in Table 4.1. More information on the chemical status in each RBD and water category can be found on the website of the European Environment Agency[28].

Map 4.1 ***Chemical status of surface water bodies in Finland based on the most recently assessed status of the surface water bodies***

Note: Standard colours based on WFD Annex V, Article 1.4.3.



Source: WISE, Eurostat (country borders)

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

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

Overall between the first and second RBMPs, there was a decrease in the proportion of surface water bodies with good chemical status from 64 % down to 49 %, similar decreases occurred across all water body types (artificial, heavily modified and natural)[29]. The proportion of surface water bodies that fail to achieve good chemical status dramatically increased between the two cycles, from 0.44 % to 49 %. In the first cycle there were surface water bodies listed as having an unknown status which were not observed in the second cycle. The increase in the number of surface water bodies failing to achieve good status may result from the classification of water bodies that were in unknown status in the first RBMPs. The considerable reduction in surface water bodies at unknown status in the second RBMP represents a significant improvement compared to the first RBMP.

Table 4.1 ***Chemical status of surface water bodies in Finland for the second and first RBMP. Note: the number in parenthesis next to the water category is the number of water bodies. Note: Chemical status assessment is based on the standards laid down in EQS Directive 2008/105/EC (version in force on 13 January 2009). Some Member States did not implement the Directive in the first RBMPs as the transposition deadline was in July 2010, after the adoption of the first RBMPs***

Category	Good		Failing to achieve good		Unknown	
	Number	%	Number	%	Number	%
Second RBMP						
Lakes (4617)	1 778	39 %	2 839	61 %		
Rivers (1913)	1 322	69 %	591	31 %		
Coastal (276)	266	96 %	10	4 %		
Total (6806)	3366	50 %	3440	50 %		
First RBMP						
Lakes (4275)	2 639	62 %	3	0.07 %	1 633	38.20 %
Rivers (1602)	1 026	64 %	24	1.50 %	552	34 %
Coastal (276)	273	99 %			3	1 %
Total (6153)	3938	64 %	27	0.4 %	2188	35.6 %

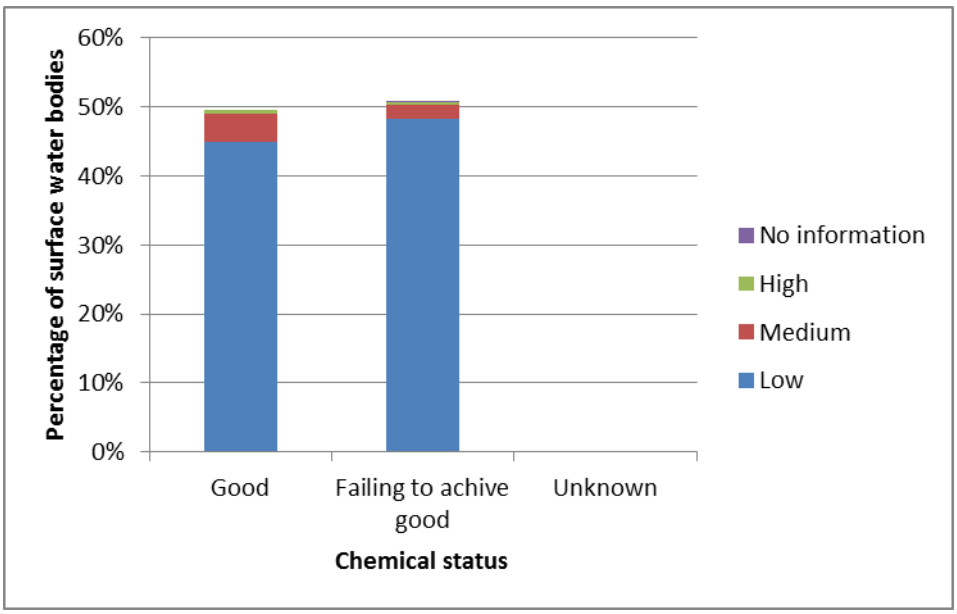
Source: WISE electronic reporting

Figure 4.3 shows the confidence in the classification of chemical status for the second RBMP. Overall 93 % of surface water bodies in Finland were classified for chemical status with low

[29] The decrease in surface water bodies at good status has been explained by the additional information provided by Finland. The reason given is that in the second cycle the biota (fish) environmental quality standard was applied for mercury. In the first cycle, the environmental quality standard for mercury was only applied for water and it was stated that it was not possible to assess status regionally.

confidence, 6 % with medium confidence and only 1 % with high confidence regardless of class. For surface water bodies, most of the classifications of good status and those that fail to achieve good status are given a low or medium level of confidence. The RBMPs indicated that confidence was assigned according to a national methodology comprising four classes: (1) no classification; (2) expert opinion based on use, emission and transport data; (3) chemical analyses, some data; (4) chemical analyses, good data[30]. Confidence in the classification of chemical status for the first RBMPs was not reported.

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



Source: WISE electronic reporting

On average, for seven out of eight RBDs, approximately 90 % of surface water bodies have been classified via expert judgement. The Åland RBD only includes lakes and coastal waters; 100 % of coastal waters were classified through expert judgement, 71.4 % of lakes were classified through monitoring, with the remaining 28.6 % being classified through expert judgement. The extensive use of expert judgement is reflected in the reported low confidence in the classification.

[30] The national methodology was used to indicate the confidence of the data. The WISE system had different categories for assessing the confidence. These translate as follows:
- No classification = no reporting to WISE
- Expert opinion = low confidence level
- Chemical analyses, some data = medium confidence level
- Chemical analyses, good data = high confidence level

In contrast to the information reported to WISE and summarised above (which states that water bodies are classified through either monitoring or expert judgement), the RBMPs include descriptions of the use of grouping and modelling in the assessment of chemical status. In the Vuoksi RBMP, grouping is especially used for the assessment of lakes in relation to mercury and according to the national methodology document; grouping is combined with expert opinion both in the case of mercury and other chemical substances. It is therefore not clear which techniques have been used in the absence of monitoring data.

Finland also stated that all available measured data was used for the classification and that expert assessment was used, when no measured data existed. The classification was carried first by carrying out a specific generic expert assessment to all water bodies, and this was subsequently replaced by measured data when available.

The expert assessment is reported to have involved the following:

- No environmental quality standard exceedances were expected for substances, which were not detected or detected only in trace level in Finnish surface water (many of those chemicals had either never or were no longer used in Finland);
- For mercury, which was the most important substance in chemical classification in Finland, a simple grouping model was developed and used[31];
- In addition to mercury, only a few other substances were expected to exceed their EQS values occasionally or in specific areas. Regional authorities undertook the assessment according case specific potential loading routes;
- For tributyltin, measurements were available only from expected 'risky' locations (such as harbours);

Cadmium and Nickel presented a risk in certain areas (rivers on the central western coast in acid sulphate soil areas) and downstream from some mining areas, scattered in different parts of Finland.

Figure 4.4 compares the chemical status of surface water bodies in Finland for the first RBMP with that for the second RBMP (based on the most recent assessment of status) and that expected by 2015. This illustrates the reduction in the proportion of surface water bodies in

[31] The model was based on available mercury data in perch and the water body type and latitude. The EQS exceedance was simulated, if this "statistical" model indicated concentration higher than 0.7 x EQSbiota. The model was assumed to be slightly more conservative/precautionary than measured data. According to the model, there were no EQS exceedances for Hg in Northern Finland (North from river Oulujoki cathcment) and in the Southern and Central Finland the exceedances depended on water body type.

good status from the first to the second cycles which was anticipated in the expected status in 2015.

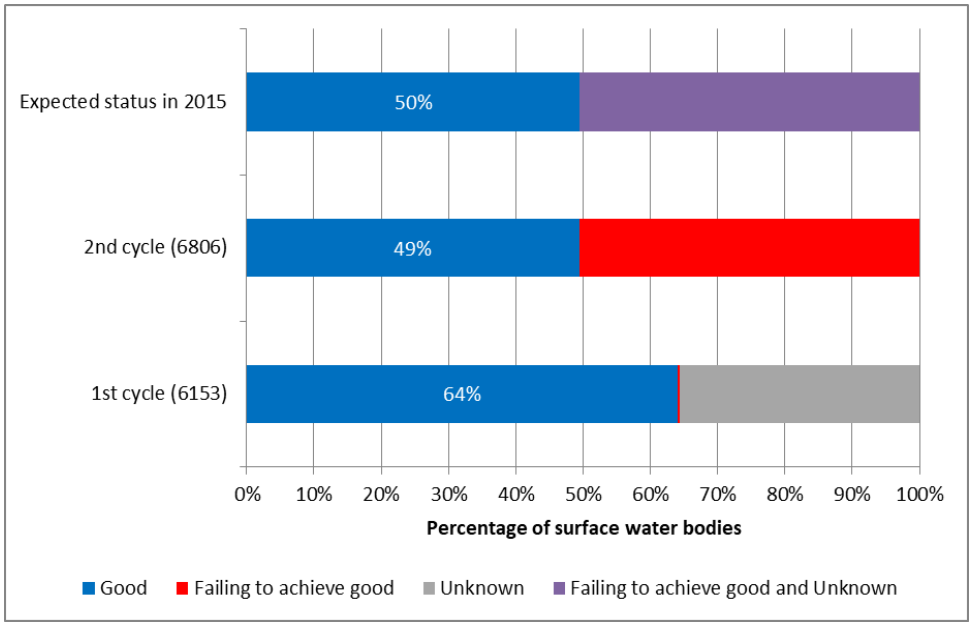
The assessment of chemical status for the second RBMP was expected to be based on the standards laid down in the EQS Directive (version in force on 13 January 2009[32]). Some Member States did not fully implement the Directive in the first RBMPs as the transposition deadline was in July 2010, after the adoption of the first RBMPs.

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

Member States were asked to report the expected date for the achievement of good chemical status. The information for Finland is shown in Figure 4.5. Good chemical status of surface water bodies is expected to be achieved by the end of the third planning cycle in five of the eight RBDs. In the remaining three RBDs (Tornionjoki, Teno, Näätämöjoki and Paatsjoki and Åland) surface waters were reported to already be at good status. The expected or actual improvement in the chemical status of surface water bodies at the end of the first cycle was reported to be as described in the RBMP.

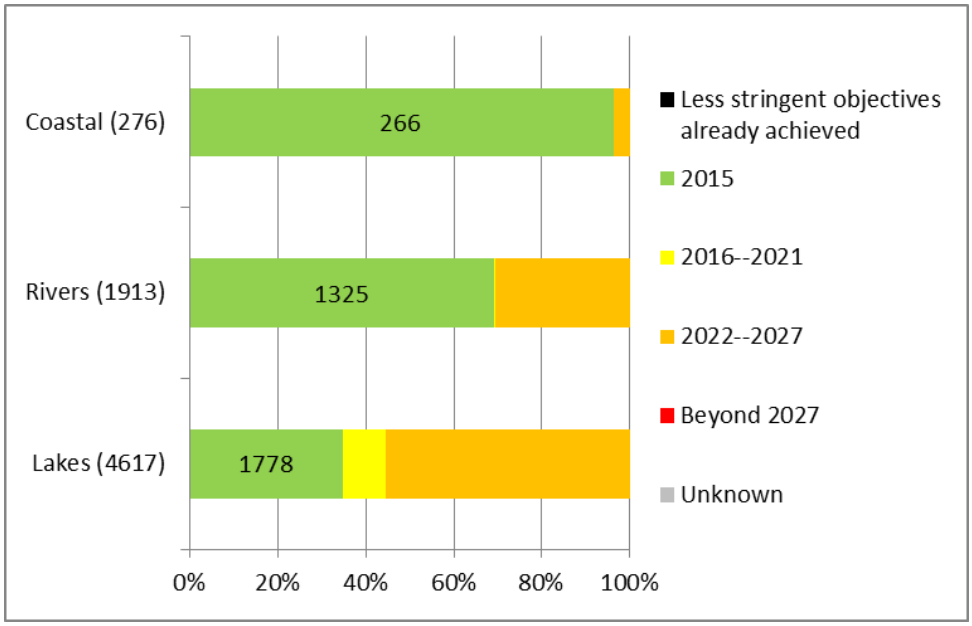
[32] Directive 2013/39/EU, which amended the Environmental Quality Standards Directive, introduced a less stringent annual average EQS for naphthalene in transitional and coastal waters. This less stringent environmental quality standard should be taken into account for the determination of surface water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

Figure 4.4 ***Chemical status of surface water bodies in Finland for the second RBMP, for the first RBMP and expected in 2015. The number in the parenthesis is the number of surface water bodies for both cycles. Note the period of the assessment of status for the second RBMP was 2010 to 2014. The year of the assessment of status for first RBMP is not known***



Source: WISE electronic reporting

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

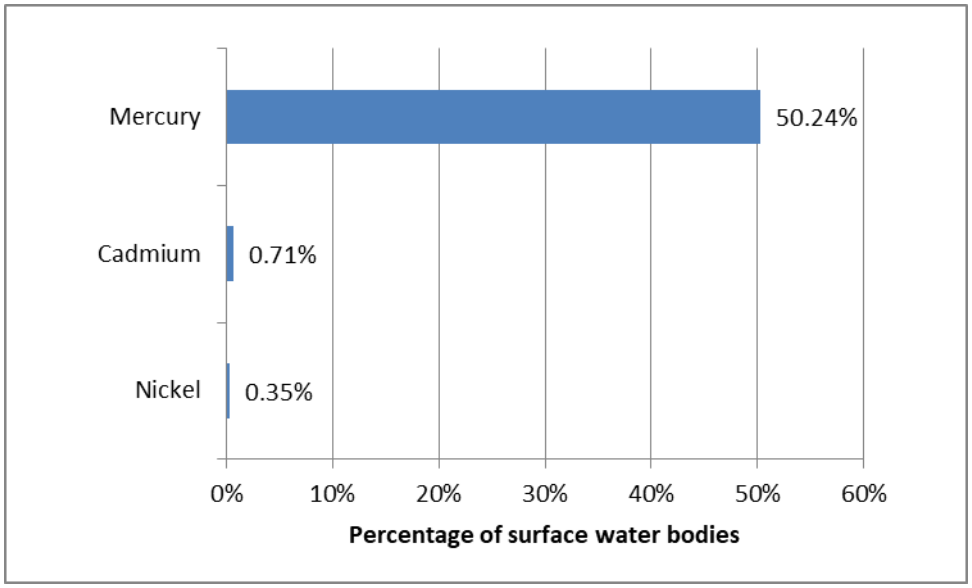


Source: WISE electronic reporting

Priority Substances causing the failure of good chemical status

Three Priority Substances were reported to be causing failure to achieve good chemical status in surface water bodies in Finland. The most common priority substances causing failure to achieve good chemical status are shown in Figure 4.6. The substances causing the greatest proportion to fail good chemical status in the second RBMP were mercury (50 %), cadmium (0.71 %) and nickel (0.35 %).

Figure 4.6 The most common Priority Substances causing failure to achieve good chemical status in surface water bodies in Finland



Source: WISE electronic reporting.

Overall for surface water bodies in Finland, the largest proportion of exceedances was for the Annual Average-Environmental Quality Standard for mercury (98 %). In terms of exceedance of both types of standard at the same time (noting that separate exceedances for the maximum allowable concentration and not the annual average were not observed and/or reported), the largest proportion was for cadmium (0.31 %).

In terms of Priority Substances resulting in an improvement in the chemical status of a water body, nickel showed an improvement in 3.2 % of the river water bodies and cadmium an improvement of 1 % in the Kokemäenjoki-Gulf of Finland RBD. No improvements occurred in the other RBDs.

Directive 2013/39/EU amended the EQS Directive. In particular, it sets more stringent environmental quality standards for seven substances[33]. Member States were required to indicate if the new standards caused the status of the surface water body to appear to deteriorate. The new standards were not reported by Finland to cause surface water bodies to deteriorate.

Ubiquitous persistent, bioaccumulative and toxic Priority Substances

According to Article 8(a) of the EQS Directive[34], eight priority substances and groups of priority substances are behaving like ubiquitous, persistent, bioaccumulative and toxic (uPBT) substances[35]. These substances are generally expected to cause widespread exceedances, and their emissions can be challenging to tackle (e.g. due to long-range atmospheric transport and deposition). In order to show the progress made in tackling other priority substances, Member States have the possibility to present the information related to chemical status separately for these substances. The assessment of uPBT substances for Finland has been based on the 2008 EQSs.

In Finland overall, there were 3440 water bodies reported to be failing to achieve good status in the second RBMP. Of these 3419 (over 99 %) are reported to have at least one uPBT that is failing its environmental quality standards; however, for approximately half of these the uPBT substance was determining the status alone. This is illustrated in the 2018 State of Water report of the European Environment Agency[36].

The influence of uPBT substances on the cause of the failure to achieve good chemical status in Finland is therefore significant; in the vast majority of cases this is due to mercury with a few coastal water bodies affected by tributyltin.

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

For the seven mainland RBDs, chloroalkanes was the only Priority Substance reported as not being used in the assessment and not monitored. The remaining 40 out of the 41 Priority Substances reported for these RBDs were used in the assessment of status. However, not all of

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

[34] Amended by Directive 2013/39/EU

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

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

these substances were reported as being monitored across these seven RBDs: between 4 and 30 out of 40 Priority Substances were monitored in the mainland RBDs. For the Åland RBD, the following 6 out of 41 Priority Substances were reported as not being used in the assessment: carbon tetrachloride; trichloroethylene; 4-nonylphenol; di(2-ethylhexyl)phthalate (DEHP); tetrachloroethylene, and; octylphenol (4-(1,1',3,3'-tetramethylbutyl)-phenol). According to WISE, no Priority Substances were reported to be monitored in this RBD, however the Åland RBD subsequently clarified that monitoring of priority substances is performed as described in the RBMP. The fact that more Priority Substances were used in the classification of chemical status than in monitoring would explain the widespread use of expert judgement in the assessment of chemical status.

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

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

Finland reported that all of the Environmental Quality Standards laid down in Part A of Annex I of the Directive 2008/105/EC[37] (in force in 2009) had been applied and no alternative and/or additional standards had been applied.

Use of mixing zones

Article 4 of the EQS Directive provides Member States with the option of designating mixing zones adjacent to points of discharge in surface waters. Concentrations of priority substances may exceed the relevant environmental quality standard within such mixing zones if they do not affect the compliance of the rest of the surface water body with those standards. Member States that designate mixing zones are required to include within their RBMPs a description of the approaches and methodologies applied to define such zones, and a description of the measures taken to reduce the extent of the mixing zones in the future.

For three of the eight RBDs in Finland (Vuoksi, Kokemäenjoki-Archipelago Sea-Bothnian Sea and Oulujoki-Iijoki), mixing zones have been designated under Article 4 of the EQS Directive.

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

For the remaining five RBDs, mixing zones have not been designated. Mixing zones have been designated following the tiered approach as laid down in the 'Technical Background Document on Identification of Mixing Zones'[38]. Measures reported to be taken to reduce the extent of mixing zones in the future include a review of the permits referred to in Directive 2008/1/EC (the IPPC Directive).

Finland provided additional information stating that in Kemijoki RBD in addition to those identified above, one mixing zone has been designated.[39]

Background Concentrations and Bioavailability

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

(a) natural background concentrations for metals and their compounds, if they prevent compliance with the environmental quality standard, and;

(b) hardness, pH or other water quality parameters that affect the bioavailability of metals.

No information has been reported for any of the eight RBDs in Finland, as to whether natural background concentrations for metals and their compounds are taken into consideration where such concentrations prevent compliance with the relevant Environmental Quality Standards.

Finland subsequently clarified that the typical background level for metals has been established in the Government Degree 1040/2006 on the harmful and hazardous substances in the surface waters (in the Annex C2). Measured concentrations are reported to be compared to the sum of the background level and the given EQS-value.

Finland states that in all of its RBDs, in assessing monitoring results against EQSs, the application of water quality parameters that affect the bioavailability of metals have been taken into account.

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

Comparing the number of sites and water bodies monitored for operational and surveillance purposes between the first and second cycles, there appears to be a net increase in monitoring sites and surface water bodies monitored for operational purposes (an increase of 876 sites and

[38] https://circabc.europa.eu/sd/a/78ce94bb-6f1c-4379-87ac-88a18967c4c3/Technical%2520Background%2520Document%2520on%2520the%2520Identification%2520of%2520Mixing%2520Zones.doc+&cd=1&hl=en&ct=clnk&gl=uk

[39] RBMP p. 49 in Kemijoen vesienhoitoalueen vesienhoitosuunnitelma vuosiksi 2016-2021.

843 water bodies noting that these numbers are for a range of parameters, not just Priority Substances) both due to relatively large increases in both river and lake monitoring. For surveillance monitoring, the number of sites has increased by 802 and the number of water bodies has increased by 799 since the first cycle. However, there remains a significant proportion of surface water bodies not monitored for chemical status (48 % of coastal water bodies, 35 % of lake water bodies and 74 % of river water bodies were monitored for chemical status).

Where monitoring for chemical status does occur, the number of Priority Substances monitored varies widely: in coastal waters up to 5, in lakes one and in rivers up to 10 Priority Substances were monitored. Only 1 of the 14 Priority Substances for which the EQS Directive requires the monitoring of the long-term trends in biota and/or sediment in coastal, lake and river water bodies in all RBDs. Finland has reported that that all of the Environmental Quality Standards laid down in Part A of Annex I of the Directive 2008/105/EC[40] for assessment of the chemical status of bodies of surface water had been applied and that alternative and/or additional standards for particular Priority Substances had not been applied. This represented progress from the first cycle when these Environmental Quality Standards were not used.

Overall between the two cycles there was a decrease in the proportion of surface water bodies with good chemical status from 64 % down to 49 %, similar decreases occurred across all water body types (artificial, heavily modified and natural). The first cycle also listed some unknown water body types, these were not present in the second cycle so no comparison can be made. The proportion of surface water bodies that fail to achieve good chemical status dramatically increased between the two cycles, from 0.44 % to 49 %. In the first cycle, there were surface water bodies listed as having an unknown status, these were not observed in the second cycle; the increase in the number of surface water bodies failing to achieve good status may result from the classification of water bodies that were in unknown status in the first RBMPs.

In terms of Priority Substances causing an improvement in chemical status between the two RBMPs, nickel showed an improvement in 3.2 % of the river water bodies and cadmium an improvement of 1 % in the Kokemäenjoki-Gulf of Finland RBD. No improvements occurred in the other RBDs.

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

Where available, classification of chemical status is based on the results of monitoring. However, on average, for seven out of eight RBDs, approximately 90 % of surface water bodies have been classified via expert judgement and the remaining 10 % by monitoring. Consequently, the majority of the classifications of good and those that fail to achieve good status are made with either low or medium confidence.

4.3. Progress with Commission recommendations

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

- Recommendation: *There is a large proportion of surface water bodies in Finland for which the status is unknown. Some RBDs have a high proportion of water bodies for which status is unknown. Finland therefore needs to increase its efforts in this first cycle to decrease this lack of knowledge and uncertainty.*

- Assessment: Progress has been made in addressing this recommendation. The proportion of surface water bodies that fail to achieve good chemical status increased between the two cycles, from 0.44 % to 49 %. In the first cycle, there were surface water bodies listed as having an unknown status, but it was not the case in the second cycle. Therefore the increase in the number of surface water bodies failing to achieve good status may result from the classification of water bodies that were in unknown status in the first RBMPs. It is worth noting in this regard that expert judgement has been widely used in the assessment of chemical status in the second cycle and that the resulting classifications are made with a low degree of confidence. All assessments across Finland were carried out between 2010 and 2014. This recommendation has therefore been partially fulfilled.

- Recommendation: *Finland needs to improve the surface water monitoring and the quality of the reporting of monitoring networks, methodologies and results, and to extend the monitoring programmes to cover all water bodies (including smaller water bodies) and all required quality elements). Finland needs to base its classification on such extended monitoring results.*

  Assessment: Limited progress has been made with this recommendation. Comparing the number of sites and water bodies monitored for operational and surveillance purposes between the first and second cycles, there appears to be a net increase in monitoring sites and surface water bodies monitored for operational purposes both due to relatively large increases in both river and lake monitoring. For surveillance monitoring, the number of

sites has increased as well. However, there remain a significant proportion of surface water bodies not monitored for chemical status. Where monitoring for chemical status does occur, the number of Priority Substances monitored varies widely. Finland provided additional information stating that measured data for Priority Substances is rarely available, compared to the large number of waterbodies.

Finland clarified that mercury, hexachlorobenzene and hexachlorobutadiene were monitored in biota for status assessment (hexachlorobenzene and hexachlorobutadiene being also monitored in water). No information is available to confirm whether the water EQS is at least as protective as the biota standard.

The majority of the classifications of good and those that fail to achieve good status are made with either low or medium confidence. This recommendation is partially fulfilled.

- Recommendation: *The chemical status assessment needs to include all the substances in the Environmental Quality Standards Directive, and Finland should specify in all cases which substances are causing failure.*

  Assessment: Progress has been made with this recommendation. Where monitoring for chemical status does occur, the number of Priority Substances monitored varies widely. As stated above, Finland clarified that mercury, hexachlorobenzene and hexachlorobutadiene were monitored in biota for status assessment (hexachlorobenzene and hexachlorobutadiene being also monitored in water) and no information is available to confirm whether the water EQS is at least as protective as the biota standard. Finland has reported which substances are causing failure of good status.

  Finland has reported that that all of the Environmental Quality Standards laid down in Part A of Annex I of the Directive 2008/105/EC[41] for assessment of the chemical status of bodies of surface water had been applied and that alternative and/or additional standards for particular Priority Substances had not been applied.

- For seven of the eight RBDs in Finland, Chloroalkanes C10-13 is the only individual priority substance reported as not being used in the assessment and not monitored. The remaining priority substances reported for these RBDs are reported to be used in the

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

assessment of status. However, as stated above, not all of these substances are reported as being monitored. This recommendation has been partially fulfilled.

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

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

5.1.1 Monitoring of quantitative status in groundwater

The number of groundwater bodies has decreased slightly from 3804 in the first RBMP to 3773 in the second RBMP (Table.5.2). 3670 groundwater bodies remained unchanged since the first RBMP. 3 626 of 3 773 groundwater bodies are not subject to monitoring for quantitative status (Table 5.1). This means that 96 % of groundwater bodies are not monitored. Monitoring now takes place in four of eight RBDs (Table 5.2). Some RBMPs indicated that grouping was applied[42] according to relatively broad geological areas but only for groundwater bodies with good status and no identified risks. For each group, a sufficient number of representative groundwater bodies and monitoring points were assigned. In the RBMP for the Åland RBD it is stated that "groundwater monitoring is not specifically well implemented"[43]. Quantitative monitoring was reported for only one groundwater body and one source. No further justification is given.

Table 5.1 Number and purpose of water bodies in Finland directly monitored

RBD	Total ground-water bodies directly monitor-ed	Monitoring Purpose						
		CHE – Chemi-cal status	DRI – Ground-water abstraction site for human consump-tion	DWD - Drinking water - WFD Annex IV.1.i	IND – Ground-water abstraction site for industrial supply	OPE – Operation-al monitor-ing	QUA – Quantita-tive status	SUR – Surveil-lance monitor-ing
FIVHA1	77	48	44	44	12	56	25	76
FIVHA2	111	68	66	66	11	81	43	111
FIVHA3	150	121	81	81	3	123	43	150
FIVHA4	42		37	37	8	7	36	42
FIVHA5	7	7	3	3	1	7		7
FIVHA6	2	2			1	2		2
FIVHA7	1	1	1	1		1		1
FIWDA	3		3	3		3		3

[42] Finland subsequently clarified that due to the large number of small groundwater bodies, grouping is a general practice in all RBDs for those in goods status and with no human pressure or risk. In addition, some monitoring points could not be reported to WISE since they did not fall within the groundwater body area.

[43] Finland subsequently clarified that there is groundwater monitoring in two places in Åland (FIWDA), and that groundwater use is in general very limited. Water companies that use groundwater also carry out monitoring.

Source: WISE electronic reporting

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

RBD	No of groundwater bodies with quantitative monitoring	Total No. groundwater bodies	% of total groundwater bodies monitored for quantitative status
FIVHA1	25	705	3.55 %
FIVHA2	43	946	4.55 %
FIVHA3	43	1 078	3.99 %
FIVHA4	36	570	6.32 %
FIVHA5		331	0.00 %
FIVHA6		115	0.00 %
FIVHA7		23	0.00 %
FIWDA		5	0.00 %

Source: WISE electronic reporting

The number of monitored groundwater bodies decreased from 164 in the first RBMP to 147 (in four RBDs) in the second RBMP. The first RBMP reported monitoring in seven RBDs and the second RBMP reports monitoring in four RBDs. The number of quantitative monitoring sites is listed in Table 5.3 and shows that the number of sites has decreased significantly by about 25 % from 211 in the first RBMP to 160 in the second RBMP.

2 068 of 3 773 groundwater bodies are identified as drinking water protected areas, located in all RBDs.

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

RBD	Total groundwater monitoring sites	Monitoring Purpose						
		CHE – Chemical status	DRI - Groundwater abstraction site for human consumption	DWD - Drinking water - WFD Annex IV.1.i	IND - Groundwater abstraction site for industrial supply	OPE – Operational monitoring	QUA – Quantitative status	SUR – Surveillance monitoring
FIVHA1	81	51	44	44	12	60	25	80
FIVHA2	129	78	72	72	12	90	50	129
FIVHA3	172	127	84	84	3	131	45	172
FIVHA4	47	0	37	37	8	8	40	47
FIVHA5	7	7	3	3	1	7	0	7
FIVHA6	2	2	0	0	1	2	0	2
FIVHA7	1	1	1	1	0	1	0	1
FIWDA	3	0	3	3	0	3	0	3

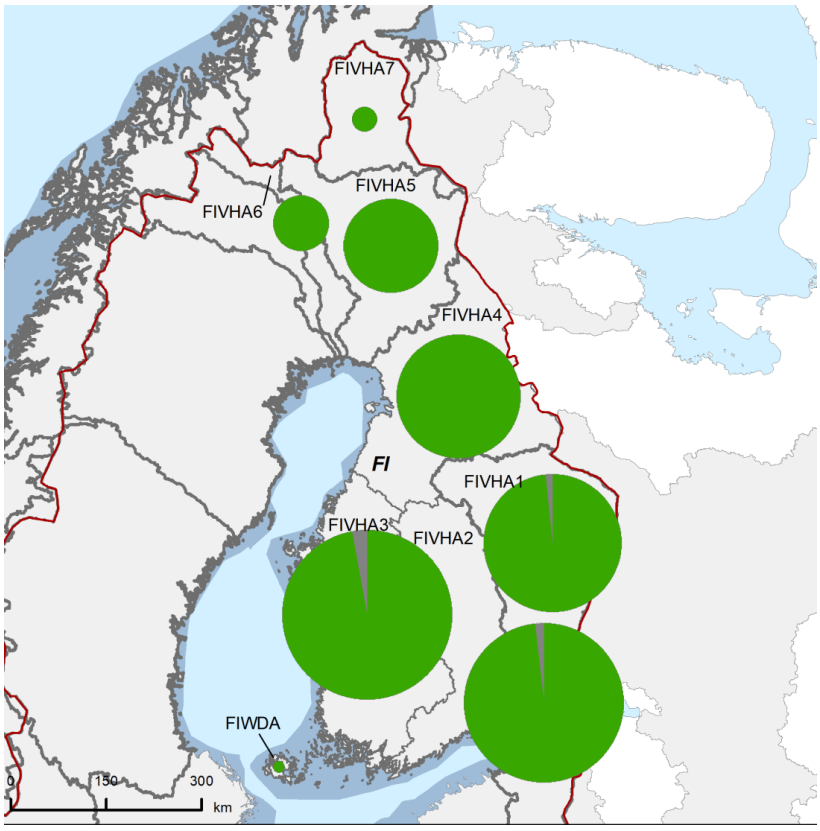
Source: WISE electronic reporting

5.1.2 Assessment and classification of quantitative status for groundwater

Map 5.1 displays the most recently assessed quantitative status of groundwater bodies. It shows that 3 709 of 3 773 groundwater bodies (98 %) were of good quantitative status, three groundwater bodies were failing good status and 61 have unknown status (Figure 5.1). In terms of area this means that about 4 % have unknown status and 0.1 % are failing good quantitative status. Figure 5.2 shows that for all groundwater bodies there is medium confidence in status classifications.

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

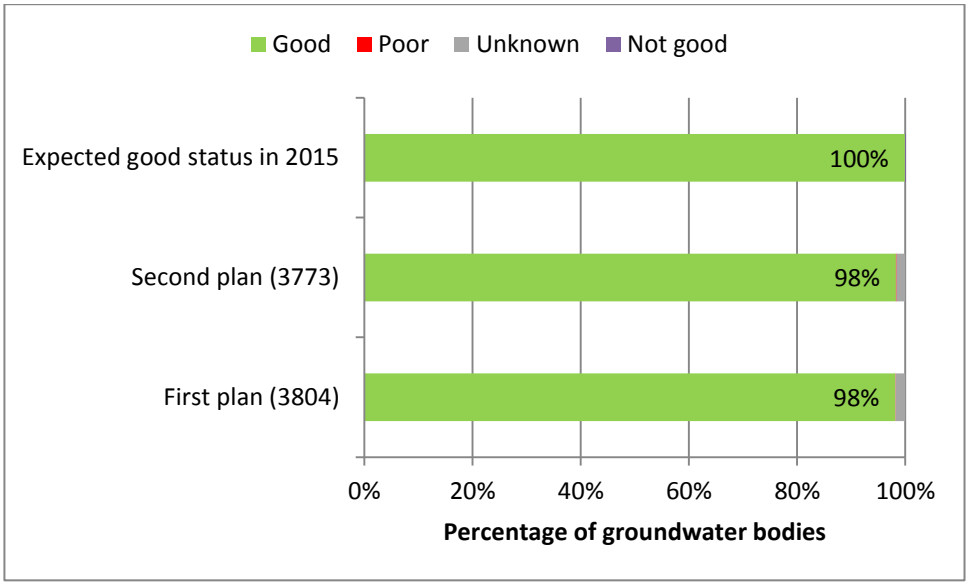
Note: Standard colours based on WFD Annex V, Article 2.2.4.



Good
Poor
Unknown
River Basin Districts
Countries outside the EU

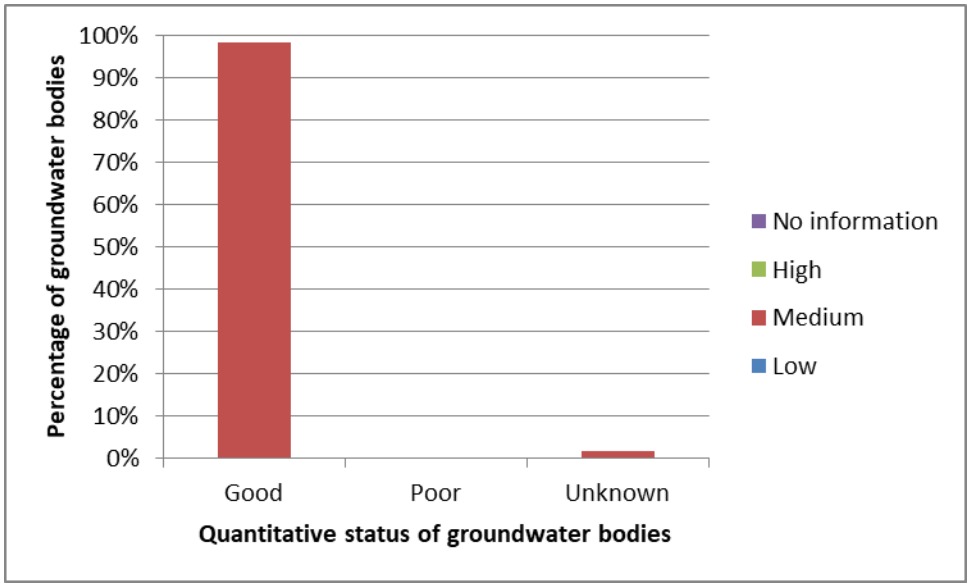
Source: WISE, Eurostat (country borders)

Figure 5.1 ***Quantitative status of groundwater bodies in Finland for the second RBMP, for the first RBMP and expected in 2015. The number in parenthesis is the number of groundwater bodies for both cycles. Note the period of the assessment of status for the second RBMP was in 2013. The year of the assessment of status for first RBMP is not known***



Source: WISE electronic reporting

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



Source: WISE electronic reporting

The total number of groundwater bodies failing good status increased from two groundwater bodies in the first RBMP to three groundwater bodies in the second RBMP. The number of groundwater bodies with unknown status decreased slightly from 68 to 61.

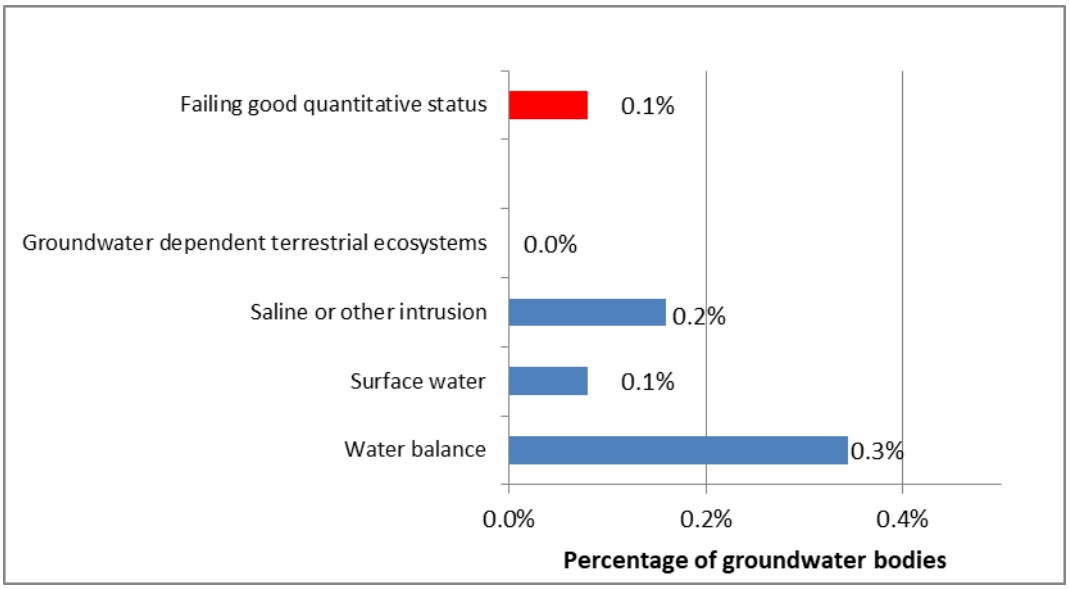
In seven RBDs water balance was assessed by a comparison of annual average groundwater abstraction against the 'available groundwater resource' for every groundwater body that is monitored. In the Åland RBD this assessment was done for a subset of all groundwater bodies. In all eight RBDs the criterion of 'available groundwater resource' has been applied in accordance with WFD Article 2.27.

In fact, three groundwater bodies (one in the Vuoksi RBD and two in the Kokemäenjoki-Archipelago Sea Bothnain Sea RBD) are failing good status but reasons for failing good status were reported for more than these three groundwater bodies[44]. The reasons for the failure of good quantitative status of groundwater bodies are shown in Figure 5.3. 13 groundwater bodies are failing good status due to failing the water balance test which means that the long-term annual average rate of groundwater abstraction is exceeding the available groundwater resource, three groundwater bodies are failing due to diminution of the status of groundwater associated aquatic ecosystems and six groundwater bodies are failing due to saline intrusions. The expected date of achievement of good quantitative status in Finland is shown in Figure 5.4. One groundwater body is expected to achieve good quantitative status at the end of the second RBMP and two are expected to achieve good quantitative status by the end of the third cycle which is in the year 2027.

In total 100 groundwater bodies (3 %) are at risk of failing good quantitative status. In all groundwater bodies the risk is related to uses or functions.

[44] Finland subsequently clarified that reasons for failure of good quantitative status have been mistakenly reported for groundwater bodies that have failed the quantitative status tests, and are still considered to be in good quantitative status.

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



Source: WISE electronic reporting

Notes:

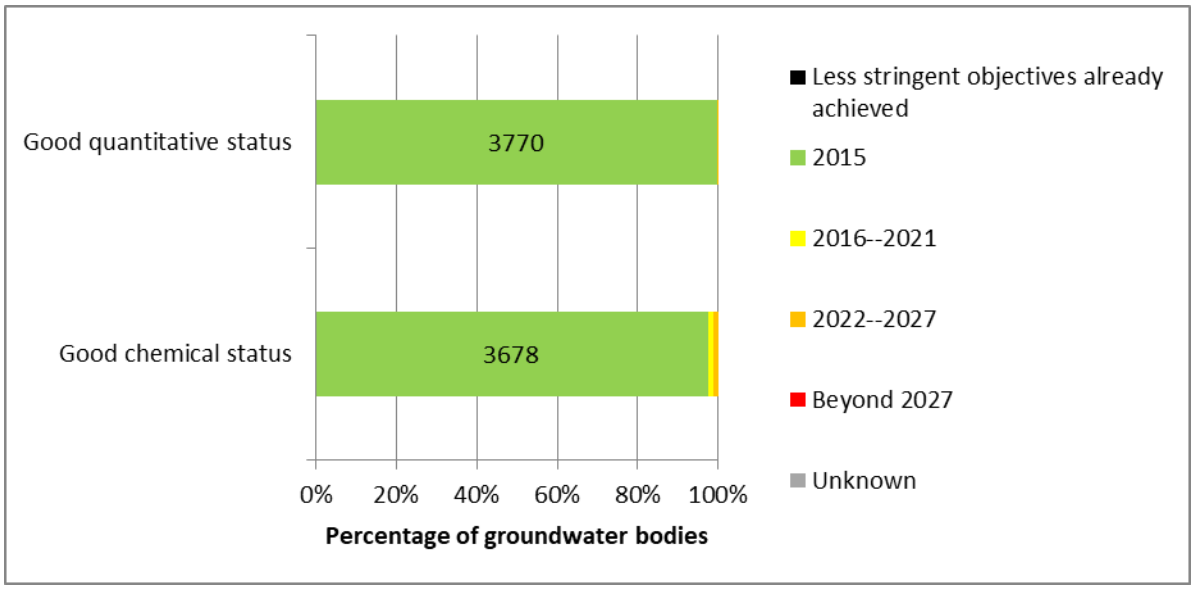
'Water balance' = long-term annual average rate of abstraction exceeds the available groundwater resource which may result in a decrease of groundwater levels.

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

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

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

Figure 5.4 ***Expected date of achievement of good quantitative and good chemical status of groundwater bodies in Finland. 3773 groundwater bodies delineated for second RBMP***



Source: WISE electronic reporting

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

Groundwater associated surface waters were considered in the status assessment in all RBDs, except for the Åland RBD where no such ecosystems exist[45]. In total 221 groundwater bodies in three RBDs were identified to be associated to such ecosystems. No risk related to groundwater associated surface waters was reported.

Groundwater dependent terrestrial ecosystems were considered in the status assessment in all RBDs, except for the Åland RBD where no such ecosystems exist[46]. For 164 groundwater bodies in seven RBDs groundwater dependent terrestrial ecosystems were identified. The needs of these ecosystems were considered in all eight RBDs. No risk related to groundwater dependent terrestrial ecosystems were reported.

5.2 Main changes in implementation and compliance since the first cycle

There was a summary of changes or updates for this topic in all the RBMPs assessed. In the Kokemäenjoki-Archipelago Sea-Bothnian Sea RBD it was explained that the number of groundwater bodies increased as new groundwater bodies were considered important or

[45] Finland subsequently clarified that these ecosystem could exist, but have not been investigated due to limited resources.

[46] Finland subsequently clarified that the information was not available for Åland at the time of the reporting, but is currently available and has been mapped.

potential drinking water sources. Changes of the status are not explicitly described, but it was mentioned that the quantitative status of two groundwater bodies is poor. In the Åland RBMP changes are not explicitly described, but it refers to a new guideline (the same as in Sweden) from 2013, which is now used for the assessment of the quantitative status.

Based on the reported information, the monitoring situation has deteriorated. The number of monitored groundwater bodies decreased from 164 in the first RBMP to 147 in the second RBMP. The number of RBDs with groundwater quantitative monitoring was reduced from 7 to 4 RBDs. There is no quantity monitoring in four RBDs (Kemijoki, Tornionjoki, Teno, Näätämöjoki and Paatsjoki and Åland).

The quantitative status of groundwater bodies deteriorated slightly overall, as the number of groundwater bodies failing good quantitative status increased from only two to only 3 of 3 773 groundwater bodies in total.

5.3 Progress with Commission recommendations

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

- Recommendation: *Finland needs to base its classification on such extended monitoring results. The ecological status assessments are based primarily on expert judgement but not on WFD compliant methods, and there is a significant shortcoming in the availability of data for classification.*

  Assessment: The recommendation mainly focused on surface water quality. Nevertheless, the recommendation to base the classification on extended monitoring results was not taken up. The number of groundwater quantitative monitoring sites has actually decreased. Therefore, this recommendation has not been fulfilled.

- Recommendation: *Groundwater monitoring should be enhanced in Finland and should be made capable of detecting pollution trends. Trend and trend reversal assessments should be carried out in the second RBMP cycle regard-less of whether additional preventive measures have been applied.*

  Assessment: The recommendation mainly focused on extending chemical groundwater monitoring for trend assessment. Nevertheless, the recommendation to enhance groundwater monitoring was not taken up. The number of groundwater quantitative

monitoring sites has actually decreased. Therefore, this recommendation has not been fulfilled.

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

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

6.1.1 Monitoring of chemical status in groundwater

The total number of groundwater bodies in Finland is 3 773 (Table 2.4). 3 526 groundwater bodies (93 % of all groundwater bodies) are not subject to surveillance monitoring (Table 5.1). Only 247 groundwater bodies in six RBDs out of 3 773 groundwater bodies in eight RBDs are monitored for chemical status. In the Oulujoki-Iijoki RBD[47] with 570 groundwater bodies and in the Åland RBD with five groundwater bodies there was no surveillance monitoring for any groundwater body. Finland subsequently clarified that because of the large number of small groundwater bodies grouping was applied in each RBD. Grouping was applied for geologically similar groundwater bodies and only for groundwater bodies at good chemical status and if there were no human pressure or risk identified.

Not all groundwater bodies at risk (6 %) were reported to be subject to operational monitoring. In the Oulujoki-Iijoki RBD there were 30 groundwater bodies at risk and only seven are subject to operational monitoring[48]. In all other RBDs the number of groundwater bodies under operational monitoring is higher than the number of groundwater bodies at risk.

The number of groundwater bodies with surveillance monitoring increased from 169 in the first RBMP to 392 in the second RBMP. The number of monitoring sites is listed in Table 5.3 (see chapter 5) and shows an increase of surveillance sites from 206 in the first RBMP to 441 in the second RBMP. The number of operational monitoring sites has been increased since the first RBMP, from 203 to 302.

Monitoring of substances at risk of causing deterioration in chemical status is very limited. The WFD core parameters nitrate, ammonium, electrical conductivity, oxygen and pH were not monitored at all in five RBDs, and in three RBDs only some were monitored.

6.1.2 Assessment and classification of chemical status in groundwater

Map 6.1 and Figure 6.1 displays the most recently assessed chemical status of groundwater bodies. It shows that 3 526 of 3 773 groundwater bodies (93 %) were of good chemical status,

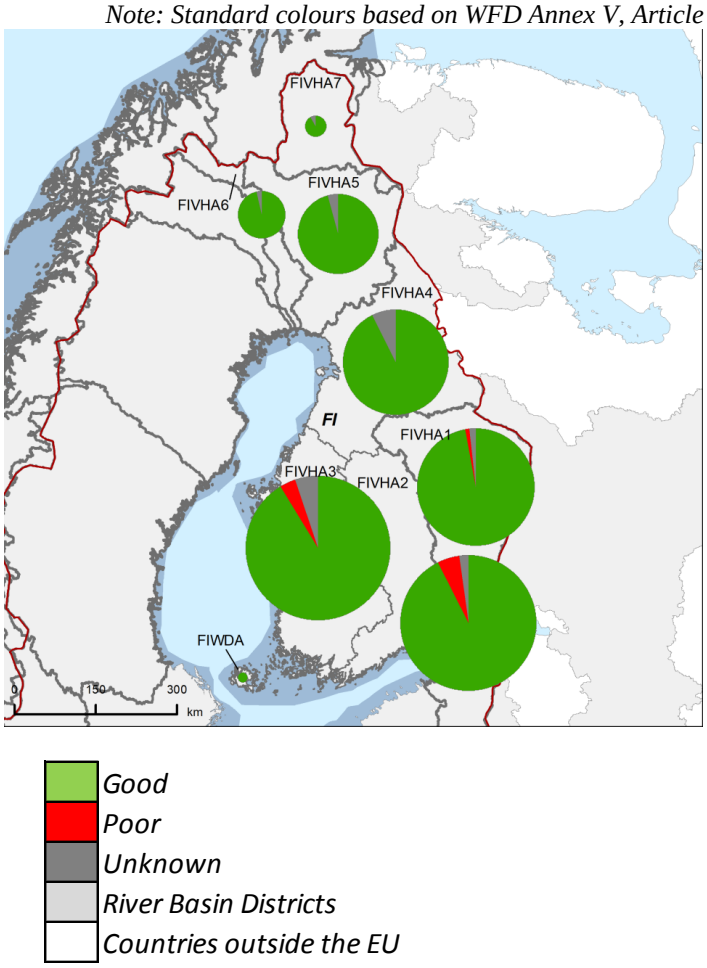
[47] Finland noted that there is surveillance monitoring in the Oulujoki - Iijoki RBD but it has not been correctly reported in WISE which led to a reporting error.

[48] Finland subsequently clarified that there must have been a technical reporting error as some of the existing monitoring sites in this RBD which were used for operational monitoring had not been reported.

96 groundwater bodies (3 %) are failing good status and the remaining 151 (4 %) are of unknown status. Figure 6.2 shows that the confidence in status classifications is of medium level. The number of groundwater bodies with unknown status declined from 216 (in four RBDs) in the first RBMP to 151 groundwater bodies (in seven RBDs) in the second RBMP.

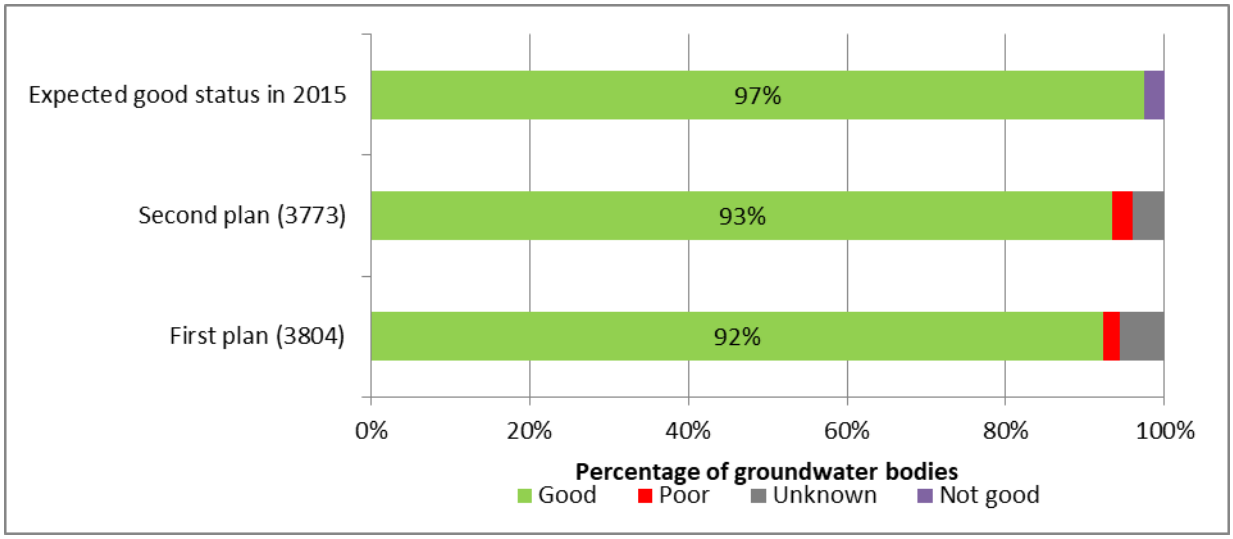
Map 6.1 ***Map of the most recently assessed status chemical status of groundwater bodies in Finland***

Note: Standard colours based on WFD Annex V, Article 2.4.5.



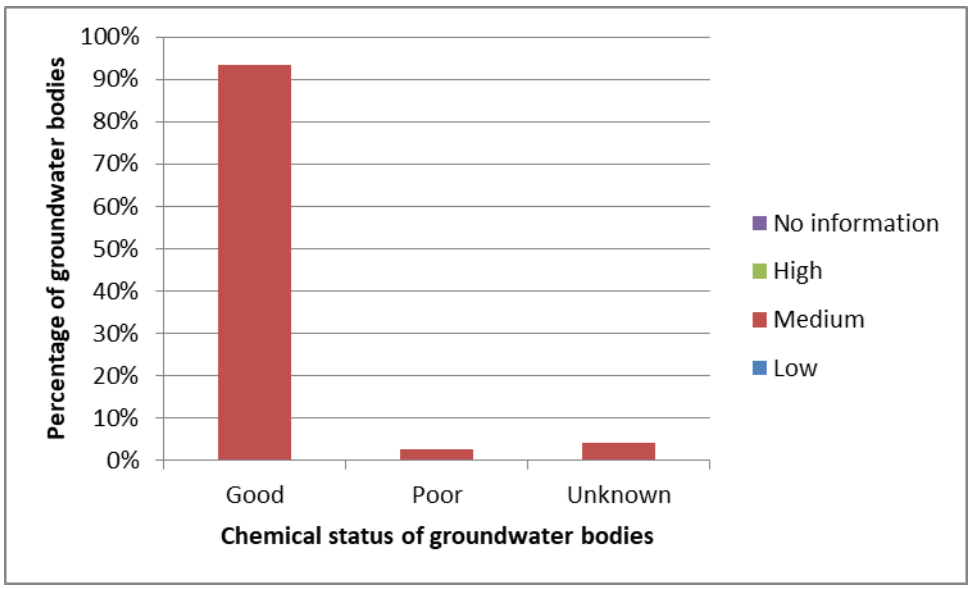
Source: WISE, Eurostat (country borders)

Figure 6.1 ***Chemical status of groundwater bodies in Finland for the second RBMP, for the first RBMP and expected in 2015. The number in the parenthesis is the number of groundwater bodies for both cycles. Note the period of the assessment of status for the second RBMP was in 2013. The year of the assessment of status for first RBMP is not known***



Source: WISE electronic reporting

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

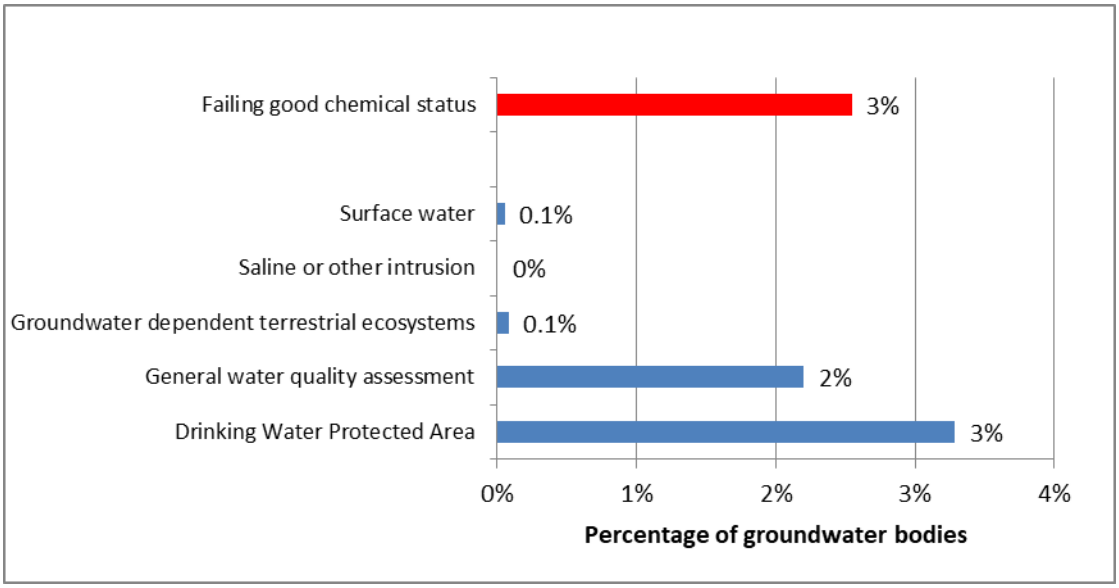


Source: WISE electronic reporting

The total number of groundwater bodies of poor status increased since the first RBMP from 81 (of 3 804 groundwater bodies) to 96 (of in total 3 773) groundwater bodies.

The reasons for the failure of good chemical status of groundwater bodies are shown in Figure 6.3 . For 83 groundwater bodies the general assessment of the chemical status for the groundwater body as a whole was failed. This assessment considered the significant environmental risk from pollutants across a groundwater body and a significant impairment of the ability to support human uses. 124 groundwater bodies were failing the drinking water test which means that the requirements of drinking water protected areas have not been met. Two groundwater bodies were failing the groundwater associated surface water test which means that there is diminution of the status of groundwater associated surface water. Three groundwater bodies were failing the groundwater dependent terrestrial ecosystem test which means that there is damage to groundwater dependent terrestrial ecosystems. Figure 6.4 shows the top 10 pollutants causing failure of status and Figure 6.6 the pollutants causing sustained upward trends.

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



Source: WISE electronic reporting

Notes:

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

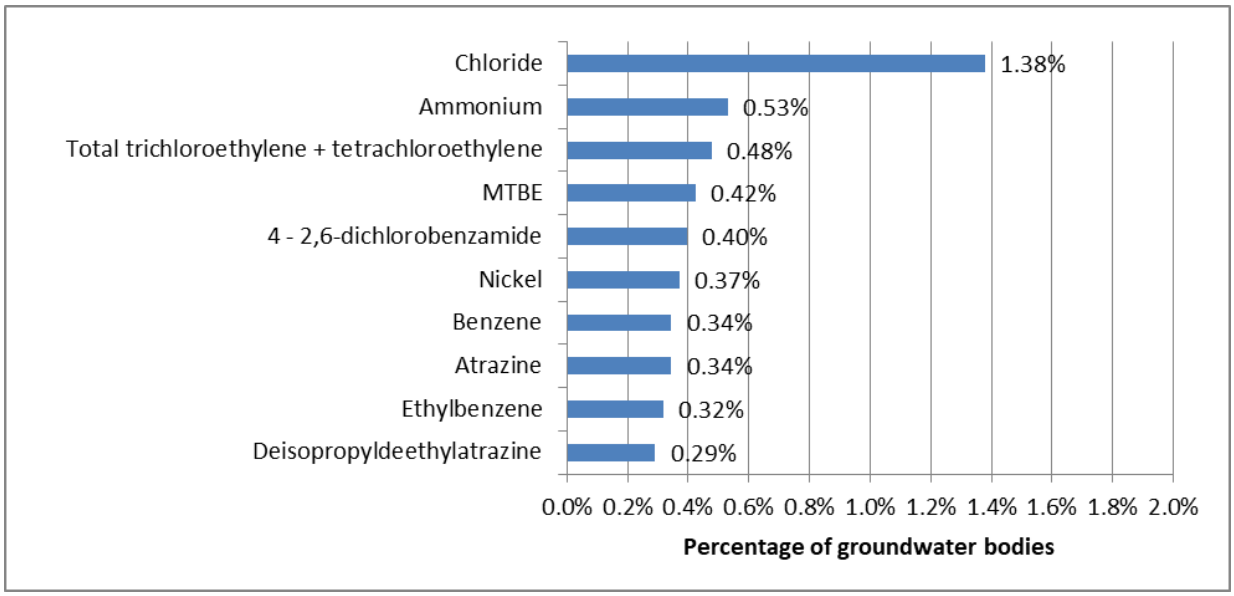
'Groundwater dependent terrestrial ecosystems' = Significant damage to terrestrial ecosystems which depend directly on the groundwater body.

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

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

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

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



Source: WISE electronic reporting

The extent of exceedance of a groundwater quality standard or a groundwater threshold value was not calculated in one RBD as there were no such exceedances.

For seven RBDs the extent of exceedance of a groundwater quality standard or a groundwater threshold value was calculated according to a method classified as 'other'. The Kokemäenjoki-Archipelago Sea-Bothnian Sea RBMP provided an explanation that if elevated concentrations are detected, more samples are taken to define the extent of contamination (how far the contamination is spread). The national methodology is described in a background document. The acceptability of an exceedance is estimated using the criteria of the most sensitive receptor (drinking water source, protection area, surface water body etc.). If the exceeded limits are estimated not to affect the most sensitive receptor, the status was considered good.

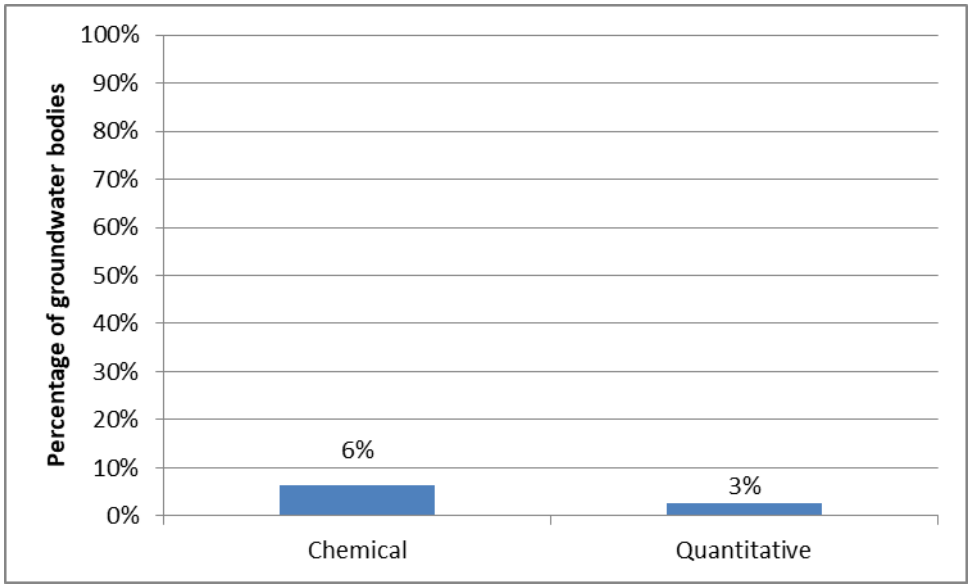
In four RBDs groundwater threshold values have not been established for all pollutants or indicators of pollution causing a risk of failure of good chemical status. The RBMPs investigated in an in-depth assessment and indicated that the Groundwater Directive[49] Annex II substances have been considered and threshold values had been established.[50] In all RBDs, natural background levels have been considered in the groundwater threshold value

[49] Groundwater Directive (GWD): Directive 2006/118/EC of the European Parliament and of the Council of 12 December 2006 on the protection of groundwater against pollution and deterioration.

[50] Finland subsequently clarified that the term 'risk' was interpreted more widely where groundwater bodies could have been identified at risk of an anthropogenic impact but there might not be a specific substance causing that risk. This approach will be corrected for the 3rd cycle report.

establishment. Figure 6.5 shows the percentage of groundwater bodies at risk of failing good chemical status and good quantitative status.

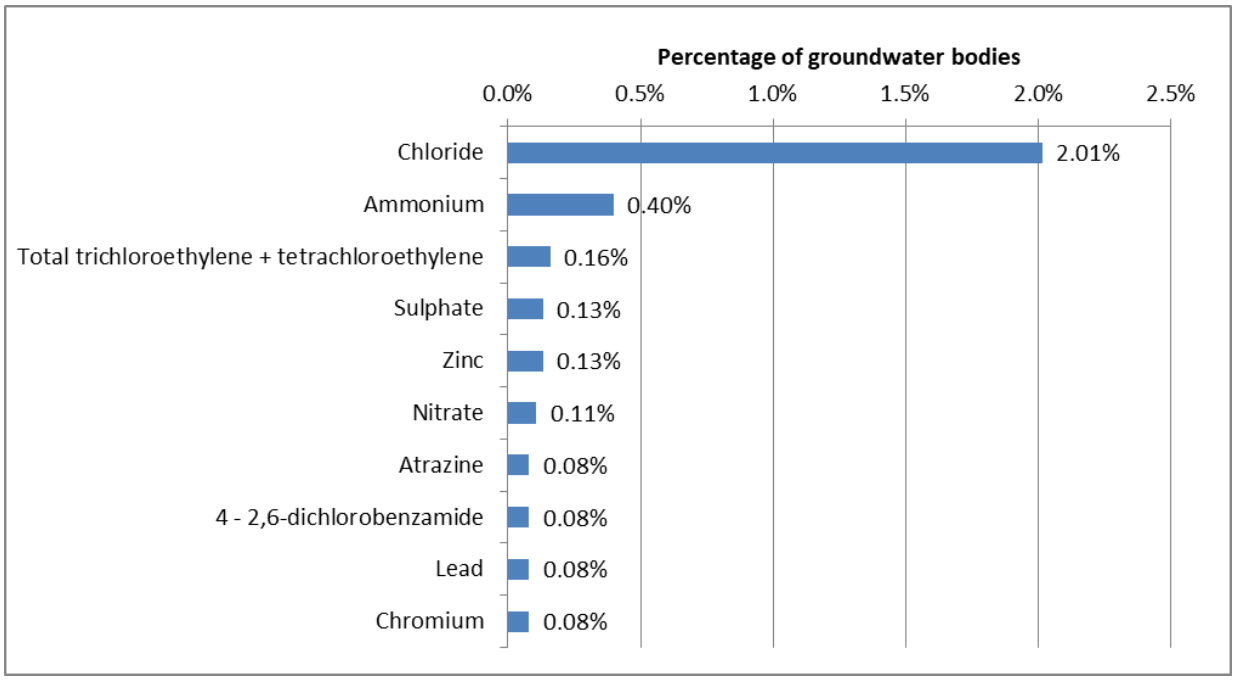
Figure 6.5 Percentage of groundwater bodies in Finland at risk of failing good chemical status and good quantitative status for the second RBMP



Source: WISE electronic reporting

A trend and trend reversal methodology was available and assessments have been performed in all eight RBDs.

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



Source: WISE electronic reporting

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

In total 221 groundwater bodies in three RBDs were identified to be associated to such ecosystems. There is related risk in one groundwater body of the Vuoksi RBD. Groundwater associated surface waters were considered in status assessment except for the Åland RBD where no such ecosystems exist.

6.2 Main changes in implementation and compliance since the first cycle

The RBMPs provided a summary of changes for this topic. In the Kokemäenjoki-Archipelago Sea-Bothnian Sea RBD it is explained that the number of groundwater bodies increased as new groundwater bodies were considered important or potential drinking water sources. Changes of the status are not explicitly described, but it is mentioned that the chemical status of 38 groundwater bodies was poor. In the RBMP of the Åland RBD changes were not explicitly described, but a new 2013 guideline was referred to (the same as in Sweden), which is now used for the assessment of the chemical status.

The monitoring situation improved slightly. Grouping of groundwater bodies for monitoring has been done in all RBDs and covers all groundwater bodies of good chemical status, no human pressures and without risk. Coverage of operational monitoring is still not complete

although it has improved[51]. Monitoring of WFD cores parameters and substances at risk of causing deterioration in chemical status is very limited.

The status situation deteriorated as the number of groundwater bodies failing good status increased.

6.3 Progress with Commission recommendations

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

- Recommendation:

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

  Finland needs to base its classification on such extended monitoring results. The ecological status assessments are based primarily on expert judgement but not on WFD compliant methods, and there is a significant shortcoming in the availability of data for classification.

  Assessment: The recommendation mainly focused on surface water quality. Nevertheless, the recommendation to base the classification on extended monitoring results was not taken up. The number of groundwater chemical monitoring sites is still very limited. Therefore this recommendation has not been fulfilled.

- Recommendation:

  A new groundwater monitoring programme for Åland includes monitoring of general parameters, but involvement of other parameters and improvements are needed to enable trend detection for the next RBMP cycles.

  Groundwater monitoring should be enhanced in Finland and should be made capable of detecting pollution trends. Trend and trend reversal assessments should be carried out in the second RBMP cycle regardless of whether additional preventive measures have been applied.

[51] Finland subsequently clarified that there must have been a technical reporting error as some of the existing monitoring sites in this RBD which were used for operational monitoring had not been reported.

Assessment: The recommendation to enhance groundwater monitoring was not fully taken up. The number of groundwater surveillance and operational monitoring sites did increase but there were still groundwater bodies with unknown status. Grouping of groundwater bodies for monitoring only included groundwater bodies of good status and without risk. In the Oulujoki-Iijoki RBD with 570 groundwater bodies and in the Åland RBD with five groundwater bodies no groundwater body was subject to surveillance monitoring. However Finland subsequently clarified that the lack of surveillance monitoring was due to technical error in reporting. Trend assessment has been performed in all RBDs and methodologies for trend reversal assessment are also available in all RBDs. Therefore this recommendation has been partially fulfilled.

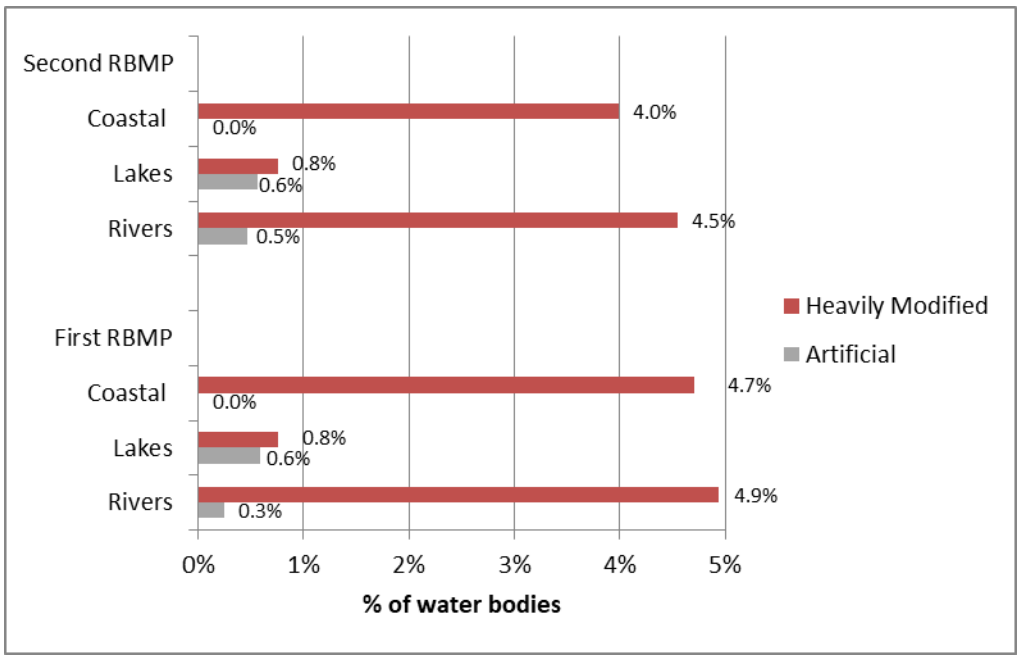
Topic 7 Designation of Heavily Modified and Artificial Water Bodies and definition of Good Ecological Potential

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

7.1.1 Designation of Heavily Modified and Artificial Water Bodies

2 % of total surface water bodies are designated as heavily modified water bodies and 0.5 % as artificial water bodies (Figure 7.1). No heavily modified water bodies and artificial water bodies were reported for the Teno, Näätämöjoki and Paatsjoki and the Åland RBD's, similar to the first RBMPs. Information on whether reservoirs were originally rivers or lakes has not been reported.

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



Source: WISE electronic reporting

The main water uses for which river water bodies are designated as heavily modified water bodies are hydropower production, land drainage for agriculture and flood protection. For lake water bodies, the main water uses for designation as heavily modified water bodies are hydropower production and flood protection. For coastal water bodies, heavily modified water body designation is related to navigation / ports, drinking water supply in urban areas and industry supply.

The main physical alterations of river and lake heavily modified water bodies are channelisation / straightening / bed stabilisation / bank reinforcement and dredging / channel maintenance. For coastal heavily modified water bodies, the main physical alterations are locks and channelisation / straightening / bed stabilisation / bank reinforcement.

The methodology for heavily modified water bodies designation includes information on the assessment of substantial change in character. Concerning the assessment of significant adverse effects of restoration measures on the use or the wider environment, the methodology notes that it must take into account the effects on the production of hydropower plants and the profitability of the power plant. According to the national methodological document of the RBMPs, in large water bodies, 5 to 10 % of loss to power generation can be considered significant with great certainty. The document suggests that the adverse effects should also be assessed in relation to the ecological benefits. A methodological option suggested is to consider different alternative definitions of significance of the adverse effects (e.g. more than 2 %, more than 5 % or more than 10 % less hydropower produced) of the measures needed to achieve significant ecological benefits. No information was however found on the assessment of other means to achieve the beneficial objectives served by the modifications of the heavily modified water body.

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

Good ecological potential was reported as defined at water body level in six out of eight RBDs. (note that there are no designated heavily modified water bodies or artificial water bodies in Teno, Naatamajoki and Paatsjoki and the Åland).

The Prague approach (based on the identification of mitigation measures) was used for defining good ecological potential. Therefore, the good ecological potential has not been defined in terms of biology. However, the relevant biological quality elements were derived and assessed, and those were reported in WISE (macrophytes, fish and benthic invertebrates). A comparison between good ecological potential to good ecological status has not been undertaken in any of the RBDs according to the WISE report.[52] According to information from the RBMP, the ecological status class of a heavily modified water body is first determined as in natural water bodies. Then the ecological potential for the heavily modified water body is defined by the water quality or hydro-morphological state, using the least good of those two. The actual classification works as follows: (1) The general water quality, as well as the status

[52] Finnish authorities have informed that a comparison between good ecological potential to good ecological status has been undertaken whenever information on biological quality elements existed. As a result, the assessment of the ecological status class of HMWB contains information of biological quality elements in addition to water quality and hydro-morphological state.

of the phytoplankton (lakes) or diatoms (rivers), has been estimated according to the ecological classification guidelines; (2) The effect of hydromorphological measures on aquatic plants, benthic invertebrates and fish has been evaluated; and 3) The status class is determined to be the poorest out of the estimations/evaluations under the previous steps 1) and 2).

For rivers, methods for assessing benthic invertebrates and fish were reported as sensitive to hydrological and morphological changes. For lakes, methods for assessing benthic invertebrates are sensitive to hydrological and morphological changes and methods for assessing macrophytes are sensitive only to hydrological changes. For coastal water bodies, methods for assessing macroalgae are sensitive to hydrological changes and methods for assessing benthic invertebrates and angiosperms are sensitive to morphological changes.

Mitigation measures for defining good ecological potential have been reported and the ecological changes expected due to the mitigation measures are described in a qualitative way. There is a classification scale of small, medium and large changes with examples for each class for fish populations, aquatic plants and benthic invertebrates.

7.2 Main changes in implementation and compliance since the first cycle

There are no significant changes in the extent of heavily modified water body and artificial water body designation since the first cycle. Only in the Kemijoki RBDs, the number of water bodies designated as heavily modified water body is almost double in the second RBMPs compared to first cycle. However, the designated heavily modified water bodies are still a very small share of total water bodies.

The reasons for changes in designation are not explicitly explained, although it is noted that the designations have been reviewed.

There is no exact description of the changes made to the methodology for designating heavily modified water bodies, but the criteria seem to be defined in a more detailed form than in the first RBMPs. Furthermore, the basis of evaluation of hydrological and morphological status is described in more detail.

Concerning the definition of good ecological potential, it is stated that the lists of hydrological and morphological measures considered and the assessment scale of their effects have been changed. No other relevant information or explanations were found.

7.3 Progress with Commission recommendations

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

- Recommendation: *The designation of heavily modified water bodies should comply with all the requirements of Article 4(3).*

  Assessment: The methodology for designation of heavily modified water bodies includes information on the assessment of substantial change in character and significant adverse effects of restoration measures on the use or the wider environment. There is no exact description of the changes made to the methodology for designating heavily modified water bodies, but the criteria seem to be defined in a more detailed form than in the first RBMPs. Furthermore, the basis of evaluation of hydrological and morphological status is described in more detail.

  However, no information was found on the assessment of other means to achieve the beneficial objectives served by the modifications of the heavily modified water body. Furthermore, specific information on the outcome of the assessment of significant adverse effects and better environmental options is not given on water body level.

  Concerning the definition of good ecological potential, it is stated that the lists of hydrological and morphological measures considered and the assessment scale of their effects have been changed. Mitigation measures for defining good ecological potential have been reported and the ecological changes expected due to the mitigation measures are described in a qualitative way. Nevertheless, good ecological potential has not been defined fully in terms of biology yet (using all detailed information on all the relevant biological quality elements).

  Therefore, this recommendation has been partially fulfilled.

Topic 8 Environmental objectives and exemptions

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

8.1.1. Environmental objectives

The environmental objectives are defined in Article 4 of the WFD. The aim is long-term sustainable water management based on a high level of protection of the aquatic environment. Article 4(1) defines the WFD general objective to be achieved in all surface and groundwater bodies, i.e. good status by 2015. Within that general objective, specific environmental objectives are defined for heavily modified water bodies (good ecological potential and good chemical status by 2015[53]), groundwaters (good chemical and quantitative status by 2015) and for Protected Areas (achievement of the objectives of the associated Directive by 2015 unless otherwise specified).

Environmental objectives for ecological and chemical status have been reported in all RBDs as well as for good quantitative and chemical groundwater status. The number of exemptions under Article 4(4) has increased compared to the first cycle.

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

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

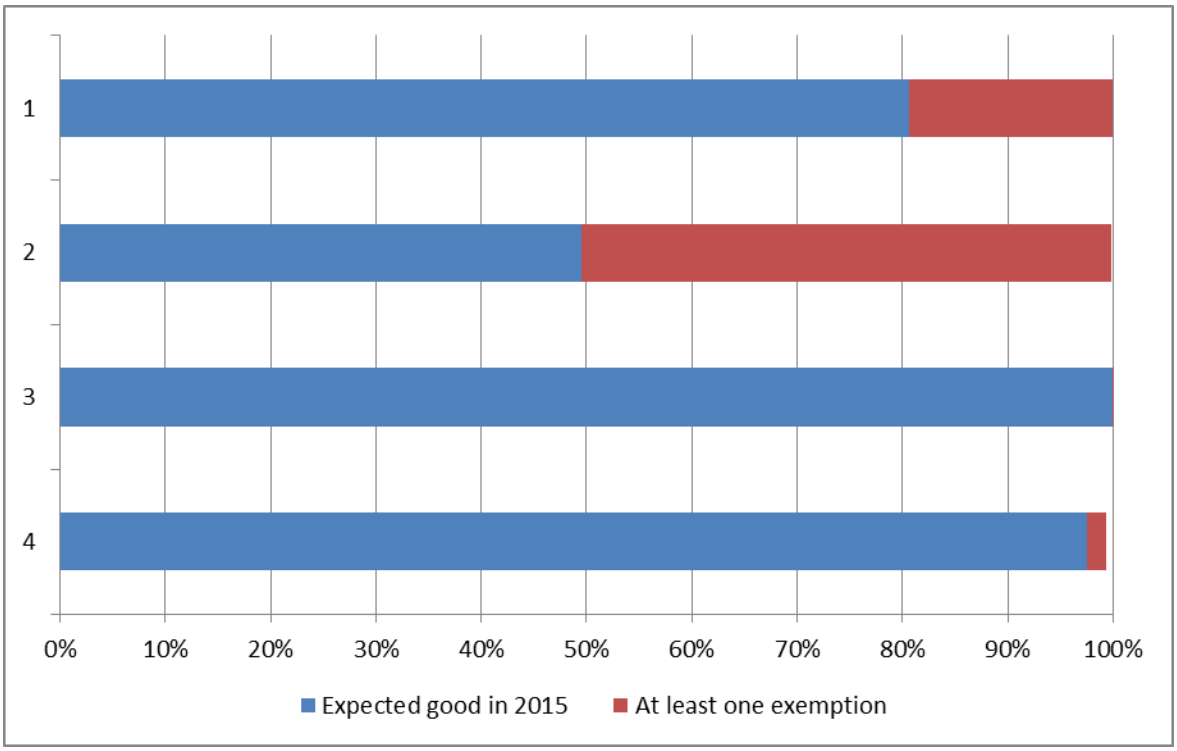
For the second RBMPs, Member States are required to report the date when they expect each surface and groundwater body to meet its environmental objective. This information is summarised for Finland elsewhere in this report: for ecological status/potential of surface waters (Chapter 3); chemical status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

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

8.1.2. Exemptions

Where environmental objectives are not yet achieved exemptions can be applied in case the respective conditions are met and the required justifications are explained in the RBMP. Figure 8.1 summarises the percentage of water bodies expected to be at least in good status in 2015 and the use of at least one exemption in Finland for the four main sets of environmental objectives. Exemptions are most widely applied in relation to surface water chemical status objectives.

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



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

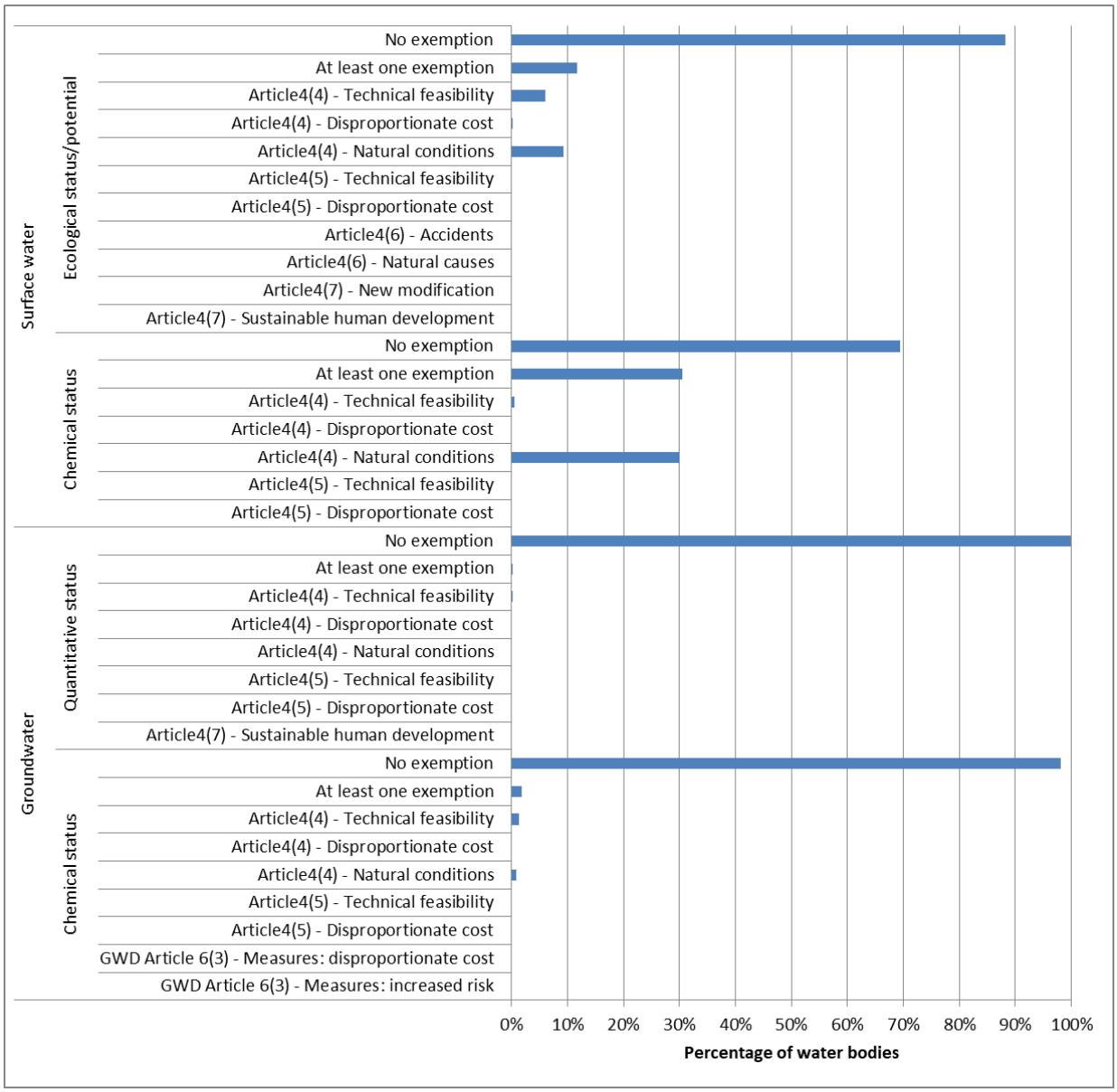
Article 4 of the WFD allows under certain conditions for different exemptions to the objectives: extension of deadlines beyond 2015, less stringent objectives, a temporary deterioration, or deterioration / non-achievement of good status / potential due to new modifications, provided a set of conditions are fulfilled. The exemptions under WFD Article 4 include the provisions in Article 4(4) - extension of deadline, Article 4(5) - lower objectives, Article 4(6) - temporary deterioration and Article 4(7) - new modifications / new sustainable human development activities. Article 4(4) exemptions may be justified by: disproportionate

cost, technical feasibility or natural conditions, and Article 4(5) by disproportionate cost or technical feasibility. In addition, Article 6(3) of the Groundwater Directive[54] allows Member States to exempt inputs of pollutants to groundwaters under certain specified circumstances.

Figure 7.2 summarises the percentage of water bodies subject to each type of exemption (and reason) in relation to the four types of environmental objectives in Finland.

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

Figure 7.2 ***Type of exemptions applied to surface water and groundwater bodies for the second plan in Finland. Note: Ecological status and groundwater quantitative status exemptions were reported at the water body level. Chemical exemptions for groundwater were reported at the level of each pollutant causing failure of good chemical status, and for surface waters for each Priority Substances that is causing failure of good chemical status***



Source: WISE electronic reporting

Application of Article 4(4)

The application of Article 4(4) has increased in surface water from the first to the second cycle and is now also applied in groundwater in the Vuoksi, Kymijoki-Gulf of Finland, Kokemäenjoki-Archipelago Sea-Bothnian Sea and Oulujoki-Iijoki RBDs[55].

In the second cycle, the justification for surface water in relation Article 4(4) refers, in all RBDs, to technical feasibility and natural conditions. In the Kymijoki-Gulf of Finland RBD also disproportionate costs are used as an argument. The Åland RBD is not using disproportional costs any longer (was used in the first cycle).

For groundwater in the Kymijoki-Gulf of Finland RBD and the Kokemäenjoki-Archipelago Sea-Bothnian Sea RBD, natural conditions and technical feasibility are used as reason for the application of Article 4(4) related to chemical status. In the Vuoksi RBD and the Oulujoki-Iijoki RBD, only technical feasibility is used as reason for the application of Article 4(4) related to chemical status. In relation to quantitative status, technical feasibility is used as an argument in the Vuoksi RBD and the Kokemäenjoki-Archipelago Sea-Bothnian Sea RBD.

As regards technical feasibility, the RBMPs provide general information. The RBMP of the Kymijoki-Gulf of Finland RBD refers to the long timeframes and the lack of technical solutions to control the diffuse nutrient loading from agriculture (surface waters). For groundwater, there are contaminated groundwater sources where pollutants are spread so wide and deep into the groundwater that there is currently no economically and technically feasible method to purify them.

According to WISE the detailed arguments behind disproportional costs refer to affordability, assessment of the consequences of non-action, benefits assessment, cost-benefit analysis, cost-effectiveness analysis and social and sectorial impacts. For surface waters in the Kymijoki-Gulf of Finland RBD mentions in relation to disproportionate costs: i) affordability ii), assessment of the consequences of non-action, iii) benefits assessment, iv) cost-benefit analysis and v) social and sectorial impacts. The justification of disproportionate costs was only used in four cases. Further explanation is not given in the RBMP. In the RBMP of the Åland RBD, two reasons for disproportionate costs in the coastal waters were mentioned: 1) nutrients are stored in the bottom sediment and are slowly released. It is not economically wise to remove

[55] Finland subsequently clarified that there are several reasons for the increase of Article 4(4) exemptions. The main reason for increase is exemptions in chemical status, because of mercury. In the 1st cycle assessment of mercury was not applied to all designated water bodies. Main reason for mercury exemptions are natural background levels and airborne pollution. Other reasons relate to increase of the number of classified water bodies and also to small increase of designated water bodies for the second RBMP's.

them with technology, and 2) there are areas with slow circulation of water, where wider passages for water could be opened, but this is not economically feasible.

As regards natural conditions, some general information on the justification is provided in the RBMPs. The RBMP of the Kymijoki-Gulf of Finland RBD mentions as justification the internal load coming from many lakes and coastal areas and that it takes time before the effect of measures are seen in large water bodies. The ecosystem-level changes are slow. For groundwater bodies, the justification refers to contaminated groundwaters, where pollutants are spread very wide and deep into the groundwater aquifers. For the coastal waters of the Åland RBD, the argument is that the overall state of the Baltic Sea has a large effect on the water quality, and it can only be improved by international co-operation. There are also some areas with slow circulation of water. Also, the internal load of nutrients is used as an argument.

The drivers causing exemptions in groundwater are mainly agriculture, industry and transport. For surface water no information was reported to WISE due to technical reasons.

The pressures responsible for exemptions in surface water in relation to good ecological status come from a broad range of activities including urbanisation, industry, agriculture, mining, atmospheric deposition and activities causing changes in hydromorphology (Table 8.1). For groundwater, the main pressures are point source pollution from industry, waste disposal and, to a minor extent, agriculture (Table 8.2).

The impacts caused by exemptions under Article 4(4) have not been reported to WISE[56]. For groundwater the impacts are chemical and nutrient pollution, abstraction exceeds available groundwater resource (lowering water table) and other significant impacts.

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

Significant pressure on surface water bodies	Failing Priority Substances	Article 4(4) - Technical feasibility exemptions	Article 4(5) - Technical feasibility exemptions
	Number	Number	Number
1.1 - Point - Urban waste water	4	97	0
1.3 - Point - IED plants	4	23	0
1.4 - Point - Non IED plants	3	8	0
1.5 - Point - Contaminated sites or abandoned industrial sites	2	7	0
1.6 - Point - Waste disposal sites	2	4	0

[56] Finland subsequently clarified that this information can be found on a general level in the RBMP.

Significant pressure on surface water bodies	Failing Priority Substances	Article 4(4) - Technical feasibility exemptions	Article 4(5) - Technical feasibility exemptions
	Number	Number	Number
1.7 - Point - Mine waters	3	33	0
1.9 - Point - Other	2	172	0
2.1 - Diffuse - Urban run-off	2	7	0
2.10 - Diffuse - Other	3	90	0
2.2 - Diffuse - Agricultural	4	814	0
2.3 - Diffuse - Forestry	4	581	0
2.4 - Diffuse - Transport	1	1	0
2.5 - Diffuse - Contaminated sites or abandoned industrial sites	1	4	0
2.6 - Diffuse - Discharges not connected to sewerage network	4	433	0
2.7 - Diffuse - Atmospheric deposition	4	3 433	0
2.8 - Diffuse - Mining	2	2	0
3.3 - Abstraction or flow diversion - Industry	3	5	0
4.1.1 - Physical alteration of channel/bed/riparian area/shore - Flood protection	3	70	0
4.1.2 - Physical alteration of channel/bed/riparian area/shore - Agriculture	1	42	0
4.1.3 - Physical alteration of channel/bed/riparian area/shore - Navigation	1	4	0
4.1.4 - Physical alteration of channel/bed/riparian area/shore - Other	2	43	0
4.1.5 - Physical alteration of channel/bed/riparian area/shore - Unknown or obsolete	1	1	0
4.2.1 - Dams, barriers and locks - Hydropower	2	63	0
4.2.2 - Dams, barriers and locks - Flood protection	2	39	0
4.2.4 - Dams, barriers and locks - Irrigation	1	13	0
4.2.5 - Dams, barriers and locks - Recreation	1	5	0
4.2.6 - Dams, barriers and locks - Industry	3	13	0
4.2.8 - Dams, barriers and locks - Other	2	6	0
4.3.1 - Hydrological alteration - Agriculture	2	15	0
4.3.3 - Hydrological alteration - Hydropower	2	26	0
4.3.4 - Hydrological alteration - Public water supply	1	2	0
4.3.6 - Hydrological alteration - Other	1	6	0
4.5 - Hydromorphological alteration - Other	2	24	0
5.1 - Introduced species and diseases	1	1	0
7 - Anthropogenic pressure - Other	4	168	0
8 - Anthropogenic pressure - Unknown	1	6	0

Source: WISE electronic reporting

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

Significant pressure on groundwater	Number of failing pollutants	Number of exemptions	
		Article 4(4) - Natural conditions	Article 4(4) - Technical feasibility
1.4 - Point - Non IED plants	54	118	128
1.5 - Point - Contaminated sites or abandoned industrial sites	61	90	125
1.6 - Point - Waste disposal sites	10		10
1.9 - Point - Other	33	16	37
2.1 - Diffuse - Urban run-off	21	16	16
2.2 - Diffuse - Agricultural	30	31	25
2.3 - Diffuse - Forestry	1	1	
2.4 - Diffuse - Transport	50	76	93
7 - Anthropogenic pressure - Other	6	6	7

Source: WISE electronic reporting

Application of Article 4(5)

As in the first cycle, Article 4(5) has not been used.

Application of Article 4(6)

Article 4(6) exemptions are not applied.

Application of Article 4(7)

Article 4(7) exemptions are not applied. In the RBMPs of both the Kymijoki-Gulf of Finland RBD and the Kemijoki RBD, there is a section on new significant projects which might trigger Article 4(7). The RBMPs explain the process of the required assessment. The check included projects where the Environmental Impact Assessment process started at the latest in 2013. The first check was if projects have significant effect on the water body or if they are at places where no surface or groundwater bodies are nearby. In the Kymijoki-Gulf of Finland RBD, all projects belonged to this category. For the Kemijoki RBD, the check continued by excluding those projects from further studies which had already a valid environmental or water permit or the implementation of the project was uncertain. During the 3rd check, the remainder of the projects were excluded from the further application of Article 4(7) for two reasons: 1) The project was not expected to cause physical alterations in water bodies and will not compromise

the achievement of good status, and 2) The project was found only to deteriorate the ecological status of water from high to good. The information for the check has been taken from the Environmental Impact Assessment documents. In both RBMPs, it was concluded that there is no need to apply Article 4(7). The potential application of the exemptions are evaluated again as the project data becomes more accurate; for example, in connection with licensing.

In the RBMP of the Åland RBD, no such section in the RBMP was found. In the RBMP of the Kemijoki RBD, there was no information on the planned Sierilä power plant project.

Application of Article 6(3) of the Groundwater Directive

Exemptions to groundwater under Article 6(3) of the Groundwater Directive[57] have not been applied.

8.2 Main changes in implementation and compliance since the first cycle

The application of Article 4(4) has increased in surface water and is now also applied in groundwater. Article 4(5), Article 4(6) and 4(7) have not been applied in either the first or second cycle.

8.3 Progress with Commission recommendations

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

- Recommendation: *Provide more detailed information in the RBMPs on activities that may modify the hydromorphological conditions of the water bodies and have a negative impact on the ecological status, including on the mitigation measures included in the Water Act (587/2011).*

  Assessment: Some of the assessed RBMP provide an explanation on the process of checking if activities that may modify the hydromorphological conditions of the water bodies and have a negative impact on the ecological status. The fact that expected deterioration from high to good status seems not to trigger an Article 4(7) assessment might be an issue of insufficient and/or potentially non-compliant implementation of WFD requirements. This recommendation has been partially fulfilled.

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

- Recommendation: *Finland needs to provide more transparency in the RBMPs on the assessment of environmental objectives and exemptions. This is particularly important given the large number of water bodies that are currently classified as in unknown status.*

  Assessment: The recommendation has been partially fulfilled as objectives have been set at water body level. The justifications on exemptions are not fully clear and there seems to be a mix of arguments. These arguments cannot always clearly be allocated to the three reasons for exemptions as set out in the WFD.

- Recommendation: *The use of exemptions under Article 4(7) should be based on a thorough assessment of all the steps as requested by the WFD, in particular an assessment on whether the project is of overriding public interest and whether the benefits to society outweigh the environmental degradation, and regarding the absence of alternatives that would be a better environmental option. Furthermore, these projects may only be carried out when all possible measures are taken to mitigate the adverse impact on the status of the water. All conditions for the application of Article 4(7) in individual projects must be included and justified in the RBMPs as early in the project planning as possible.*

- Assessment: Article 4(7) has not been applied but some procedures have been established for potential Article 4(7) cases in the context of the Environmental Impact Assessment. The fact that expected deterioration from high to good status seems not to trigger an Article 4(7) assessment might be an issue of insufficient and/or potentially non-compliant implementation of WFD requirements.

Topic 9 Programme of measures

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

The Key Types of Measures (KTM) referred to in this section are groups of measures identified by Member States in the Programme of Measures, which target the same pressure or purpose. The individual measures included in the Programme of Measure (being part of the RBMP) are grouped into Key Types of Measure for the purpose of reporting. The same individual measure can be part of more than one Key Types of Measure because it may be multi-purpose, but also because the Key Types of Measure are not completely independent silos. Key Types of Measure have been introduced to simplify the reporting of measures and to reduce the very large number of Supplementary Measures reported by some Member States (WFD Reporting Guidance 2016).

A Key Type of Measure may be one national measure but it would typically comprise more than one national measure. The 25 predefined Key Types of Measure are listed in the WFD Reporting Guidance 2016.

The Key Types of Measure should be fully implemented and made operational within the RBMP planning period to address specific pressures or chemical substances and achieve the environmental objectives.

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

9.1.1. General issues

An indication as to whether or not measures have been fully implemented and made operational is when they have been reported as being planned to tackle significant pressures (at the Key Types of Measure level). Significant pressures are also reported at the water body level. It would therefore be expected that there would be measures planned in the RBMP to tackle all significant pressures. Significant pressures considered to be causing failure of objectives for groundwater bodies have been reviewed for a selection of the eight RBDs for which information is provided from Finland. In the Vuoksi RBD, significant pressures causing failure of objectives for groundwater cover point sources, diffuse sources, abstraction or flow

diversion, groundwater recharge/levels/volumes and diffuse atmospheric pollution. However KTMs reported do not cover the significant pressures relating to groundwater recharge/levels/volumes and diffuse atmospheric pollution. In the Oulujoki-Iijoki RBD, the KTMs reported do not cover significant pressures associated with diffuse atmospheric pollution, abstractions or flow diversions associated with public water supply and alterations of water levels/volumes. In the Kemijoki RBD, KTMs reported do not cover certain significant pressures causing failure associated with point sources (Point - Other), diffuse urban run-off and abstractions or flow diversions associated with public water supply. For this RBD, a KTM was reported for 'Diffuse - discharges not connected to the sewage network' but this source is not identified as a significant pressure causing failure. For surface waters, there are further examples of where KTMs do not cover all significant pressures identified. In the Vuoksi RBD, significant pressures from dams, barriers and locks (for irrigation, industry, and others respectively) as well as from diffuse atmospheric and pollution and groundwater recharges are not covered. A very similar situation arises in the Oulujoki-Iijoki RBD except that abstraction or flow diversion (industry) replaces groundwater recharges. For the Åland RBD, diffuse atmospheric pollution is not covered by a KTM.

14 national basic measures have been mapped against four predefined KTMs (KTM1 - Construction or upgrades of wastewater treatment plants, KTM15 - Measures for the phasing-out of emissions, discharges and losses of Priority Hazardous Substances or for the reduction of emissions, discharges and losses of Priority Substances, KTM16 - Upgrades or improvements of industrial wastewater treatment plants (including farms) and KTM22 - Measures to prevent or control the input of pollution from forestry). KTM 15 - Measures for the phasing-out of emissions, discharges and losses of Priority Hazardous Substances or for the reduction of emissions, discharges and losses of Priority Substances applies to only three RBDs, the other each apply to seven of the eight RBDs. 59 national supplementary measures have been mapped against 14 pre-defined KTMs and one nationally developed KTM (Lake Restoration). The basic measures apply in a variety of RBDs; for example, nine national supplementary measures have been mapped against KTM2 - Reduce nutrient pollution from agriculture in all eight RBDs, whilst one national supplementary measure has been mapped against KTM3 - Reduce pesticides pollution from agriculture in four RBDs. Basic measures have been reported against only three of the requirements of Article 11(3) (see Table 7.2): Article 11(3)(g): Requirement for prior regulation of point source discharges liable to cause pollution; Article 11(3)(h): Measures to prevent or control the input of pollutants from diffuse sources liable to cause pollution; and the Urban Waste Water Treatment Directive (91/271/EEC). An inventory of national basic and supplementary measures has been reported. In general the KTMs reported to be mapped against national measures are aligned with those

KTMs reported for significant pressures although there are some inconsistencies. KTM4 - Remediation of contaminated sites (historical pollution including sediments, groundwater, soil) was reported as addressing significant pressures in five RBDs, KTM8 - Water efficiency, technical measures for irrigation, industry, energy and households as addressing significant pressures in three RBDs and the national KTM Environmental management of soil extraction sites in five RBDs but none of these KTMs have any national measures mapped against it. On the other hand, KTM13 - Drinking water protection measures (e.g. establishment of safeguard zones, buffer zones etc.) and KTM24 - Adaptation to climate change have national measures mapped against them, but are not reported to be operational in addressing significant pressures.

No KTMs have been reported to be tackling River Basin Specific Pollutants. A direct explanation for this is not provided in the Annex 0 report for Finland. A considerable number of pollutants are identified to be causing failure of objectives in groundwater at least in the four RBDs for which information was reported (Vuoksi, Kymijoki – Gulf of Finland, Kokemäenjoki – Archipelago Sea–Bothnian Sea, and Oulujoki-Iijoki). No information on pollutants causing failure in surface waters is presented.

Information on the Priority Substances causing failure of objectives was reported for only five of the eight RBDs (Vuoksi, Kymijoki – Gulf of Finland, Kokemäenjoki – Archipelago Sea – Bothnian Sea, Oulujoki-Iijoki, and Kemijoki). The Priority Substances causing failures of chemical status include: nickel and its compounds; cadmium and its compounds; mercury and its compounds and the tributyltin cation. KTMs have been identified for nickel and cadmium. No KTMs were reported for mercury and its compounds and the tributyltin (TBT) cation but explanations are proved in the Annex 0 report. For mercury, a statement is made that national measures do not exist for long-range transport of airborne pollutants such as mercury. For tributyltin, it is stated that observed high tributyltin concentrations in certain sites originate from historical use and although restrictions were put in place prior to the ban across the European Union in 2008, due to its slow degradation, it is still present in the environment.

Reported indicators of the gap to good status for significant pressures on groundwater and surface waters were reported fairly sporadically across RBDs and only for 2015. No values are available for 2021 and 2027. The same applies to the KTM indicator values. It is therefore not possible to track reductions in pressures with implementation of measures from 2015 to 2027. Explanations are provided in the Annex 0 including statements that data is not in the requested form and that certain measures (in the rural development programme) relating to nutrients are primarily steering instruments and reduction of nutrients cannot be quantified.

Cost-effectiveness analysis is an appraisal technique that provides a ranking of alternative measures on the basis of their costs and effectiveness, where the most cost-effective has the highest ranking. Finland did not carry out a cost effectiveness analysis for the first Programme of Measures due to a lack of sufficient data, although a qualitative assessment of benefits was carried out, together with an extensive assessment of the costs of measures. For the second Programme of Measures, a combination of a qualitative and quantitative cost-effectiveness analysis has been carried out in all eight RBDs for supporting the selection of measures proposed under the second cycle Programme of Measures.

The use of cost-effective analysis and the prioritisation of measures was further examined in the RBMP and background documents, where two RBDs (Tornionjoki (Finnish part) and the Åland) were examined in further detail.

In the Tornionjoki RBD, it was found that in general, prioritisation of measures is achieved by assessing the impacts of potential measures as well as their cost-efficiency. It is indicated in the RBMP that the measures to reduce nutrient and solids loads are the most important for surface water environmental objectives. All sectors with significant pressures are included. Modelling was used in the cost-effective analysis of water conservation measures for agriculture, sparsely populated settlements and their sewage treatment and peat production (cost per unit of Phosphorus). Concerning nutrient loading in other sectors, cost-effectiveness has been examined within the industry by comparing the unit costs of the measures with their impact. When selecting sector-specific measures, cost-effectiveness has been assessed on the basis, inter alia, of sector-specific design manuals. In this assessment, different pressures have been taken into account. Concerning nutrient loading in other sectors, cost-effectiveness has been examined within the industry by comparing the unit costs of the measures with their impact. The cost-effective analysis for sector-specific measures has been done in a more qualitative form on the basis of the design manuals for the sectors concerned and in this assessment different pressures have been taken into account.

In the Åland RBD, cost-effective analysis has been described in principle in an annex to the RBMP and the costs/unit (kg Nitrogen and/or Phosphorus) has been calculated for seven different measures related to agriculture, aquaculture and point sources. It is not clear how this generic description has been implemented in practice. Specifically, it is indicated that treatment of waste water from single houses has a high priority (chapter 7.9.1 of the RBMP) and the only "physical" measures are prioritised. The other "needs" for the Åland RBD are more soft/administrative/educative measures such as the long-term development of sustainable fish production, promotion of local cooperation projects to reduce nutrient loss form agriculture etc.

It should be noted that treating waste water from single houses is the most expensive measure - so the principle of cost effectiveness seems not to have been followed.

A critical factor in the success of the implementation of the Programme of Measures is the availability of funding to support the investments required. Member States are required to report on the investment costs for the first cycle and those planned for the second cycle (2015 to 2021) for Basic Measures under Article 11.3(a), Basic Measures under Article 11.3(b-l), Supplementary Measures under Article 11.4 and Additional Measures under Article 11.5. No data has been reported for Finland. In the Annex 0 document for Finland it states that this information has not been gathered for the RBMPs.

A clear financial commitment (e.g. approved budget or financial mechanism by the parliament, Ministry of Finance or other financial responsible authority) was reported to have been secured for only one out the eight RBDs, the Åland RBD which is administered in comparison to the other RBDs, through separate legislation than the other RBDs in Finland, via the Government of Åland. However, for the other 7 RBDs, finance was reported to have been secured at a sectoral level for agriculture, industry, urban, hydropower and aquaculture. Finance was reported not to have been secured from the transport sector for any of the eight RBDs and securing of finance was reported as "not applicable" for all eight RBDs in terms of the energy, recreational and flood protection sectors. For the Åland, the industry and hydropower sectors are also identified as being not applicable with regard to securing finance.

The Vuoksi and Teno-, Näätämö- and Paatsjoki (Finnish part) RBDs are landlocked. The remaining six Finnish RBDs report that joint consultation was carried out on the RBMPs and Marine Strategy, and that the preparation of the RBMPs and Programme of Measures has been co-ordinated with the implementation of the Marine Strategy Framework Directive. However, the need for additional measures or more stringent measures beyond those required by the WFD in order to contribute to the achievement of the relevant Marine Strategy Framework Directive objectives in coastal and marine environments have not been considered in the Programme of Measures. National/RBD specific measures that are relevant to the Marine Strategy Framework Directive (basic measures, their associated KTMs and the pressures and/or chemical substances that they are tackling to meet WFD objectives) are provided for all RBDs. These include the construction or upgrading of wastewater treatment plants, measures for improving longitudinal continuity (such as establishing fish passes) and measures for phasing out/reducing emissions of priority hazardous/Priority Substances.

For the Finish RBDs, the RBMPs and Floods Directive[58] Flood Risk Management Plans have not been integrated into a single plan. Joint consultation was reported to have been carried out on the RBMPs and Flood Risk Management Plans in seven out of the eight RBDs (not for the Vuoksi RBD). All RBDs report that the objectives and requirements of the Floods Directive have been considered in the second RBMP, that specific win-win measures in terms of achieving the objectives of the WFD and Floods Directive, drought management and use of Natural Water Retention Measures have been included in the Programme of Measures and that the design of new and existing structural measures (such as flood defences, storage dams and tidal barriers) have been adapted to take into account WFD Environmental Objectives. In terms of whether a clear financial commitment has been secured for the implementation of the Programme of Measures in the flood protection sector, "not applicable" was reported indicating that the measures for this sector are not relevant in the RBD reported. However in all RBDs, Article 9(4) has not been applied to impoundments for flood protection and as such it would be an activity/use which should be subject to cost recovery under Article 9.

9.1.2. Measures related to other significant pressures

Indicator gaps (the degree to which a particular pressure needs to be reduced to achieve WFD objectives) for other significant pressures (e.g. Introduced species and diseases) have mostly been reported for the RBDs (seven out of the eight RBDs, not for the Åland RBD) but only for 2015 (not for 2021 and 2027). The same applies to the reporting of indicator values for KTMs with values only being provided for 2015 for seven out of the eight RBDs.

9.1.3. Mapping of national measures to Key Types of Measure

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

Table 9.1 summarises the number of national measures that have been mapped to the relevant Key Types of Measure in Finland. Also shown is the number of RBDs for which the Key Type of Measure has been reported.

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

Table 9.2 then summarises the type of basic measures associated with the national measures mapped against the Key Type of Measure.

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

Key Type of Measure	National basic measures	National supplementary measures	Number of RBDs where reported
KTM1 - Construction or upgrades of wastewater treatment plants	4	6	7
KTM12 - Advisory services for agriculture		1	7
KTM13 - Drinking water protection measures (e.g. establishment of safeguard zones, buffer zones etc)		2	1
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	1		3
KTM16 - Upgrades or improvements of industrial wastewater treatment plants (including farms).	8	8	7
KTM2 - Reduce nutrient pollution from agriculture		9	8
KTM21 - Measures to prevent or control the input of pollution from urban areas, transport and built infrastructure		7	7
KTM22 - Measures to prevent or control the input of pollution from forestry	1	3	7
KTM23 - Natural water retention measures		2	2
KTM24 - Adaptation to climate change		1	1
KTM25 - Measures to counteract acidification		2	2
KTM3 - Reduce pesticides pollution from agriculture.		1	4
KTM5 - Improving longitudinal continuity (e.g. establishing fish passes, demolishing old dams)		2	6
KTM6 - Improving hydromorphological conditions of water bodies other than longitudinal continuity		7	6
KTM7 - Improvements in flow regime and/or establishment of ecological flows		2	1
KTM99 - Other key type measure reported under PoM - Lake restoration		6	4
Total number of Mapped Measures	**14**	**59**	**8**

Source: Member States reporting to WISE

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

Key Type of Measure	Basic Measure Type		
	Point source discharges	Pollutants diffuse	Urban Waste Water
KTM1 - Construction or upgrades of wastewater treatment plants			4
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			1
KTM16 - Upgrades or improvements of industrial wastewater treatment plants (including farms).	8		
KTM22 - Measures to prevent or control the input of pollution from forestry		1	

Source: WISE electronic reporting

Key

'Point source discharges' = Article 11(3)(g): Requirement for prior regulation of point source discharges liable to cause pollution.
'Pollutants diffuse' = Article 11(3)(h): Measures to prevent or control the input of pollutants from diffuse sources liable to cause pollution.
'Urban Waste Water' = Urban Waste Water Treatment Directive (91/271/EEC) .

9.1.4. Pressures for which gaps to be filled to achieve WFD objectives have been reported and the Key Types of Measure planned to achieve objectives

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

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

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

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

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

9.2 Main changes in implementation and compliance since the first cycle

In general the amount and quality of readily available information has improved between the two cycles but mainly because of the revised reporting schema. Often there is no equivalent information for the first cycle and it is difficult therefore to make direct comparisons between the 2 cycles on what has changed significantly. From a review of the baseline conditions for the key Commission recommendations, no obvious significant changes are observed. In the RBMP and background documents, two RBDs were examined in more detail. In the RBMP for the Tornionjoki (Finnish part) RBD, it was mentioned that a national guide has been drawn up for the design of measures. The aim has been to design measures and groups of measures that allow the achievement of the environmental goals in the most cost-effective way. During the second planning period, the effectiveness and cost-effectiveness of the measures were more reliable than the first cycle, with the help of various models (e.g. KUTOVA). For the Åland RBD, it is explained in the RBMP that the Programme of Measures has been updated and new supplementary measures have been developed.

9.3 Progress with Commission recommendations

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

- *Recommendation: Moreover, the links between different pressure-impact-measures should be further explained. Measures should be more concrete and include the final expected achievements and, if possible, quantify the impact in terms of the WFD objectives.*

  Assessment: Finland states that good progress in reducing pollution from point sources has been achieved in urban and industry sectors and that there has also been progress

with measures associated with forestry, rehabilitation of watercourses and in managing hydromorphological pressures as well as in groundwater protection. It states that more measures are needed to tackle the treatment of rural waste water with the extension of deadlines for wastewater purification systems of individual rural houses delaying implementation. A considerable delay in implementing agricultural measures from the first cycle was reported due to insufficient resources being available, regardless of whether a high percentage of farmers are committed to the rural development programme. Furthermore, reported indicators of the gaps to be filled for significant pressures on groundwater and surface waters are provided only fairly sporadically across RBDs and only for 2015. No values are available for 2021 and 2027. The same applies to the KTM indicator values. It is therefore not possible to track reductions in pressures with implementation of measures from 2015 to 2027. This recommendation has been partially fulfilled.

- Recommendation: *Ensure close linkage of the analysis of pressures and impacts with the determination of measures in the RBMPs in relation to chemical pollution.*

  Assessment: The evidence suggests that limited progress has been made. No Key Types of Measure (KTMs) have been reported to be tackling River Basin Specific Pollutants (a considerable number of pollutants are identified to be causing failure of objectives in groundwater at least in the four RBDs for which information was reported. No information on pollutants causing failure in surface waters is presented). For certain Priority Substances reported to be causing failure of objectives, measures associated with upgrades or improvements to industrial wastewater treatment plants are cited. This recommendation has been partially fulfilled.

- Recommendation: *Although the Finnish Programmes of Measures are relatively well presented, meaningful information regarding the scope, the timing and the funding of the measures should be included in the Programme of Measures so the approach to achieve the objectives is clear and the ambition in the Programme of Measures is transparent. This is very relevant to improve the first RBMP, and also to improve the drafting of the next RBMP.*

  Assessment: Progress against this recommendation appears to be fairly limited. A clear financial commitment (e.g. approved budget or financial mechanism by the parliament, Ministry of Finance or other financial responsible authority) was reported to have been secured for only one out the eight RBDs (the Åland RBD which is administered in comparison to the other RBDs, through separate legislation than the other RBDs in

Finland, via the Government of Åland). However, at a sectoral level for the other seven RBDs finance was reported to have been secured for agriculture, industry, urban, hydropower and aquaculture. As stated above, indicators of the gaps to be filled for significant pressures on groundwater and surface waters were reported fairly sporadically across RBDs and only for 2015. No values are available for 2021 and 2027. The same applies to the KTM indicator values. It is therefore not possible to track reductions in pressures with implementation of measures from 2015 to 2027 and thus the level of ambition in the POM is not at all transparent. This recommendation has been partially fulfilled.

- Recommendation: *Provide a more comprehensive cost-effectiveness and cost-benefit analysis, to clarify the criteria applied for the selection of measures in the RBMPs.*

  Assessment: Progress has been made in that it was reported that a combination of a qualitative and quantitative cost-effectiveness analysis has been carried out in all eight RBDs for supporting the selection of measures proposed under the second cycle Programme of Measures (no cost-benefit analysis was carried out for the first cycle). This recommendation was explored further in the RBMP and background documents and it was found that whilst a methodology has been developed for the application of cost-effective analysis and cost-benefit analysis, and that this appears to have been applied for some measures and some sectors, it is not clear how the principle of cost-effective analysis has been applied in practice. This recommendation has therefore been partially fulfilled.

Topic 10 Measures related to abstractions and water scarcity

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

10.1.1 Water exploitation and trends

Water abstraction and scarcity are not considered relevant for Finland, except for a few water bodies. In all RBDs, the percentage of groundwater bodies in bad quantitative status or of surface water bodies affected by abstraction pressures is below 1 %. No data were reported on the Water Exploitation Index +.

10.1.2 Main uses for water consumption

No data have been reported for the uses of water consumption, because water quantity pressures are not reported as significant.

10.1.3 Measures related to abstractions and water scarcity

All water uses are subject to permitting procedures under Article 11(3)(e), with the exception of small abstractions.

Under Article 11(3)(c), measures promoting efficient and sustainable water use (e.g. water metering and allocations) were implemented in the previous cycle and no new measures nor significant changes are planned in any of the RBDs.

Under Article 11(3)(f), controls, including a requirement for prior authorisation of artificial recharge or augmentation of groundwater bodies, were implemented in the previous cycle and no new measures nor significant changes are planned in any of the RBDs.

Some RBMPs include supplementary measures to reduce the abstraction pressures where relevant to specific water bodies. The measures are included in KTM 8 - "Water efficiency, technical measures for irrigation, industry, energy and households" (e.g. on 36 water bodies in the Kokemäenjoki-Archipelago Sea-Bothnian Sea RBD).

10.2 Progress with Commission recommendations

There were no Commission recommendations based on the first RBMPs and Programme of Measures for this topic.

Topic 11 Measures related to pollution from agriculture

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

The link between pressures and measures has been established. For nutrients, a gap assessment is lacking and therefore it is not clear if the measures are sufficient. For pesticides, the number of water bodies failing environmental quality standards are reported for all basins except Åland, but KTM3 – "Reduce pesticides pollution from agriculture" is not reported as a measure in all basins (see below).

Basic (the minimum requirement to be complied with) and supplementary measures are not clearly reported under KTMs in WISE[59]. According to WISE KTM2 - "Reduce nutrient pollution from agriculture", was reported in all RBDs. KTM3 – "Reduce pesticides pollution from agriculture", was reported in all RBDs except the Kemijoki, the Tornionjoki, the Teno, Näätämöjoki and Paatsjoki and the Åland RBDs. KTM12 – "Advisory services for agriculture", is applied in all RBDs except the Åland RBD. KTM13 - "Supplementary drinking water protection measures" (e.g. establishment of safeguard zones, buffer zones etc.), is only applied in the Åland RBD, but there will be significant changes to them as a result of this RBMP.

In the Kokemäenjoki-Archipelago Sea-Bothnian Sea RBD, according to the national guidance document "Vesienhoidon toimenpiteiden suunnittelu vuosille 2016-2021. Maatalous, turkistuotanto ja happamuuden torjunta" there are safeguard zones, and new measures will be established to control pollution from old fur farming sites. In addition, according to the RBMP, there are measures targeted at groundwater areas: control of pollution from animal shelters (related to Nitrates Directive and environmental permitting), monitoring of groundwater sites, and establishing multi-annual grasslands or safeguard zones (buffer zones) near groundwater areas to control pollution from field cultivation.

Measures under KTM 2 – "Reduce nutrient pollution from agriculture" and KTM 3 – "Reduce pesticides pollution from agriculture" are voluntary as they are part of the Rural Development Program. There is information on the area on which a measure will be applied.

Implementation of basic measures outlined in Article 11(3)(h) for the control of diffuse pollution from agriculture at source are applied with the same rules across all the RBDs.

[59] Finland subsequently clarified that it has not linked all national basic and supplementary measures to KTM's, which causes inconsistency in WISE reporting. In general, both basic and supplementary measures have been linked to individual KTM's,

General binding rules to control diffuse pollution from agriculture are applied to nitrates and phosphorus.

Farmers/Farmers' Unions have been consulted under the Public Consultation process in all RBDs

Financing of agricultural measures is secured in all RBDs.

11.2 Main changes in implementation and compliance since the first cycle

The information reported is not sufficient to provide a clear judgment. The gap assessment lacking in the first cycle is also not reported in the second cycle. Pressures and measures taken seem to be linked but the reporting is inconsistent.

11.3 Progress with Commission recommendations

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

- *(first RBMP Report – 2012) Agriculture is indicated as exerting a significant pressure on the water resource in all Finish RBDs. This should be translated into a clear strategy that defines the basic/mandatory measures that all farmers should adhere to and the additional supplementary measures that can be financed. This should be developed with the farmers' community to ensure technical feasibility and acceptance. There needs to be a very clear baseline so that any farmer knows the rules this can be adequately advised and enforced and so that the authorities in charge of the CAP funds can adequately set up Rural Development programmes and cross compliance water requirements.*

- Recommendation: *Address the gaps in basic measures (e.g. tools to control P pollution, especially in terms of monitoring the actual P applications).*

  Assessment: This recommendation has partly been fulfilled as the implementation of basic measures outlined in Article 11(3)(h) for the control of diffuse pollution from agriculture at source are applied with the same rules across the whole RBD. Also, general binding rules to control diffuse pollution from agriculture are applied to nitrates and phosphorus.

- Recommendation: *Introduce binding requirements for farmers to address their nutrient inputs, particularly of phosphates, where the voluntary programmes/scheme do not work.*

  Assessment: This recommendation has been partly fulfilled. The binding requirements are based on existing legislation: Nitrates Decree and environmental legislation, for example. There are no other binding requirements as the environmental payment scheme is voluntary for farmers to join. There is no information on how the renewed Nitrates Decree (Valtioneuvoston asetus eräiden maa- ja puutarhataloudesta peräisin olevien päästöjen rajoittamisesta (1250/2014) in force 1.4.2015[60]) deals with phosphates, because use of phosphates in fields is regulated with fertilizer product act (539/2006). Finland also monitors regularly phosphate and nitrates trends in fields. This statistics are available on http://stat.luke.fi/en/indicator/nitrogen-and-phosphorus-balance.

- Recommendation: *Ensure the link between Nitrates Directive and WFD (e.g. measures used to track and monitor compliance, outcomes of the Nitrates Decree amendment process and the resulting improved linkages, etc.).*

  Assessment: It is unclear if the recommendation has been implemented. There is a measure type called measures according to the Nitrates Directive, but details are not clearly provided.

- Recommendation: *Adopt measures oriented towards manure handling and recycling, decrease nutrients discharges, etc. in order to improve nutrient balances.*

  Assessment: This recommendation has been fulfilled. There is a measure type on animal shelters related to the Nitrates Directive and environmental permitting, and another measure type related to animal shelters on groundwater areas. There are investment cost estimates for the latter type.

- Recommendation: *Include information on the activities that will be undertaken in order to reduce the deficiencies in the requirements for cross-compliance (manure collection, storage, etc.) depending on the outcome of the impact assessment on slurry storage. Finland should ensure that funding for these activities is designated and enforcement ensured via the RBMPs.*

[60] http://www.finlex.fi/fi/laki/alkup/2014/20141250

Assessment: Not enough information was reported to assess progress with this recommendation.

- Recommendation: *Provide further clarification on how Common Agricultural Policy funding will be targeted once the approach is clarified (budget share and implementation schemes – voluntary or mandatory - of measures funded by Common Agricultural Policy Pillar II that help to achieve water objectives). Finland should take into account the measures highlighted during the bilateral meeting with COM services held on 17 September 2014.*

  Assessment: Not enough information was reported to assess progress with this recommendation.

Topic 12 Measures related to pollution from sectors other than agriculture

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

In the context of this topic, pollution is considered in terms of nutrients, organic matter, sediment, saline discharges and chemicals (priority substances, river basin specific pollutants, groundwater pollutants and other physico-chemical parameters) arising from all sectors and sources apart from agriculture. Key types of measures (KTM) are groups of measures identified by Member States in their Programmes of Measures which target the same pressure or purpose. A KTM could be one national measure but would typically comprise more than one national measure. The same individual measure can also be part of more than one KTM because it may be multipurpose, but also because the KTMs are not completely independent of one another.

KTMs relevant to non-agricultural sources of pressures causing failure of WFD objectives have been reported for all RBDs in Finland. These KTMs include:

KTM 1 - “Construction or upgrades of wastewater treatment plants”

KTM4 - "Remediation of contaminated sites (historical pollution including sediments, groundwater, soil)"

KTM15 – "Measures for the phasing-out of emissions, discharges and losses of Priority Hazardous Substances or for the reduction of emissions, discharges and losses of Priority Substances"

KTM16 – "Upgrades or improvements of industrial wastewater treatment plants (including farms)"

KTM 21 - “Measures to prevent or control the input of pollution from urban areas, transport and built infrastructure”.

and

KTM22 – “Measures to prevent or control the input of pollution from forestry”

The WFD specifies that Programmes of Measures shall include, as a minimum, “basic measures” and, where necessary to achieve objectives, “supplementary measures” when basic

measures are not enough to address specific significant pressures. Quantitative information on basic and supplementary measures used to tackle pollution from non-agricultural sources (number of measures per KTM) is provided in the RBMPs for all RBDs in Finland. Quantitative information on types of basic measures to tackle pollution from non-agricultural sources is provided for six out of eight Finnish RBDs. For the Teno, Näätämöjoki and Paatsjoki and the Åland RBDs, this information seems to be missing in WISE. Finland clarified that for the Åland RBD this information is available in the RBMP.

Finland provided more targeted information on basic measures required under Article 11(3)(c to k). An authorisation and/or permitting regime to control waste water point source discharges (Basic measures Article 11(3)(g)) operates in all Finnish RBDs for surface and groundwater. A register of waste water discharges (Basic measures Article 11(3)(g)) is available in all RBDs in Finland for surface and groundwater. Small waste water discharges are exempted from controls in all Finnish RBDs. There is a prohibition of all direct discharges to groundwater in all Finnish RBDs.

According to the information reported to WISE, measures to eliminate / reduce pollution from Priority Substances and other substances have been applied in all Finnish RBDs and the KTMs are related to significant pressures. In the second RBMPs, measures are reported for all substances causing failure in achieving the WFD objectives.

12.2 Main changes in implementation and compliance since the first cycle

The first RBMPs mentioned that measures to tackle chemical pollution were rather vague, not targeted to specific pollutants as there was little or unclear information on which were the substances causing problems. Measures did not seem to be related to the source/pressures. According to information reported to WISE for the second cycle, measures to eliminate / reduce pollution from Priority Substances and other substances have been applied in all Finnish RBDs and the KTMs are related to significant pressures. In the second RBMPs, measures were reported for all substances causing failure in achieving the objectives.

12.3 Progress with Commission recommendations

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

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

taken into account in the assessment of ecological status. ***It is important that there is an ambitious approach to combatting chemical pollution from such pollutants and therefore that adequate measures are put in place.****" "Ensure close linkage of the analysis of pressures and impacts with the determination of measures in the RBMPs in relation to chemical pollution."*

Assessment: The reported data indicated that measures to eliminate or reduce pollution from Priority Substances and other substances (Basic measures Article 11(3)(k)) have been applied in all RBDs. In the second RBMPs, measures were reported for all substances causing non-compliance. However, this recommendation is considered partially fulfilled, as no information on whether the measures are sufficient to reach good status could be found.

- Recommendation: "*Reducing the quantity of nutrients (N and P) from urban waste water is necessary to allow the achievement of WFD objectives. Finland should ensure nitrogen removal from UWWTPs in order to achieve good environmental status, especially in relation to problems in removing nitrogen in low-temperature environments."*

  Assessment: The reported data show that the basic measures to tackle pollution from non-agricultural sources included construction or upgrades of wastewater treatment plants and also upgrades or improvements of industrial wastewater treatment plants (including farms) but no details were provided on how nitrogen removal from Urban Waste Water Treatment Plants especially in low-temperature environments will be ensured.

  In the national background document "Vesienhoidon toimenpiteiden suunnittelun ohjeistus v. 2016-2021. Yhdyskunnat ja haja-asutus" it was mentioned that new Waste Water Treatment Plants will be constructed and existing plants will be updated according to the plans of municipalities. In the RBMP of the Teno, Näätämöjoki and Paatsjoki RBD, there were no such projects mentioned. No description of specific technologies was provided. This recommendation is considered partly fulfilled.

Topic 13 Measures related to hydromorphology

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

Significant hydromorphological pressures are identified in all eight RBDs. The sectors most commonly associated to the significant hydromorphological pressures reported in Finland are hydropower, flood protection and agriculture.

Operational KTMs to address all or part of the specific hydromorphological pressures were reported for all RBDs. The main KTMs associated with significant hydromorphological pressures are 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 and KTM23 - Natural water retention measures. Even though KTM5 - Improving longitudinal continuity was reported for seven out of eight RBDs (all except the Teno, Näätämöjoki and Paatsjoki RBD), management objectives in terms of river continuity have not been set in any of the RBDs.

Examples of specific measures included are ecological restoration of rivers (for example breeding grounds), development of water regulation practices (including multi-objective measures, such as improving the recreational use value of regulated lakes, more efficient use of hydropower, managing flood and drought risks or reducing impacts caused by short-term regulation) and improvement of fish migration conditions (changes in flow rates that improve the migration conditions where barriers exist, fish ladders, fish lifts or natural bypasses).

In terms of basic measures to tackle hydromorphological pressures, there is an authorisation and/or permitting regime in place to control physical modifications, which covers changes to the riparian area of water bodies, as well as a register of physical modifications of water bodies in all eight RBDs, according to WFD article 11(3)(i).

Win-win measures in terms of achieving the objectives of the WFD and Floods Directive[61], drought management and use of Natural Water Retention Measures were reported to be included in the Programme of Measures of all eight RBDs. The specific KTM23 on Natural Water Retention Measures is applied in four of the eight RBDs and is addressing physical alterations from agriculture and flood protection. Examples of Natural Water Retention Measures included are restoration of flood meadows and flood forests as well as constructed

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

wetlands in agricultural areas. No information was found on a strategy that prioritises the implementation of Natural Water Retention Measures and green infrastructure measures.

The design of new and existing structural measures (such as flood defences, storage dams), is also reported to have been adapted to take into account WFD objectives in all eight RBDs.

In the seven mainland RBDs, ecological flows have been derived for some relevant water bodies but the work is still on-going. The ecological flows which have been derived have not been implemented yet but there are plans to do so during next cycle. In the Åland RBD, ecological flows have not been derived for the relevant water bodies and there are no plans to do it during the second cycle. It should be noted though that ecological flows are probably not relevant for this RBD, as there are no river water bodies.

Indicators on the gap to be filled for significant hydromorphological pressures are only reported for 2015 but not for 2021 or 2027, which does not allow any conclusions on the level of ambition in closing the gap until the next cycles. Also for the KTM, indicator values are only reported for 2015, but not for 2021 and 2027. For the Åland RBD, no indicator values for KTM were reported[62].

13.2 Main changes in implementation and compliance since the first cycle

The improved way of reporting into WISE for the second RBMPs makes it easier to link specific measures to significant hydromorphological pressures. In the first RBMPs, the information was unclear as to which types of hydromorphological pressures were targeted with specific hydromorphological measures.

In the second RBMPs, significant hydromorphological pressures and operational KTMs are identified in all eight RBD. Overall the measures planned in the second cycle are largely the same as in the first cycle. In the Åland RBD, there were no significant morphological pressures, and hence no relevant measures were foreseen in the first RBMPs. In the second cycle, the only relevant measure mentioned for the RBD the Åland RBD is a proposal for changes in the regulation of sediment management[63].

[62] Finland subsequently clarified that this was a reporting error, as the indicator values were included in the Åland RBD

[63] Finland subsequently informed the Commission that this was due to a reporting gap, as the Åland RBD includes this in the chapter on hydromorphological pressures.

13.3 **Progress with Commission recommendations**

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

- Recommendation: *Provide more detailed information in the RBMPs on activities that may modify the hydromorphological conditions of the water bodies and have a negative impact on the ecological status, including the mitigation measures included in the Water Act (587/2011). Finland should include in the RBMPs a clear measure to review all existing hydropower permits to ensure the achievement of WFD objectives, in particular in relation to the ecological flow, fish passes and other mitigation measures.*

  Assessment: The reporting for the second RBMPs indicates that measures are planned to address hydromorphological pressures related to agriculture. However, no specific information was found in the RBMPs on mitigation measures included in the Water Act (587/2011), which were mainly relevant to agricultural activities such as drainage, thus no conclusion can be drawn on progress made concerning the first part of this recommendation.

  No information was found in the second RBMPs indicating a systematic revision of all existing hydropower permits to address hydromorphological problems. However, there is a policy instrument measure studying the need for the development of water legislation so that the permits and the obligations can, if necessary, be amended or revised in order to attain the objectives of river basin and marine management. There is reference to planned measures related to water regulation practices and the improvement of fish migration conditions, but at the same time, ecological flows have not been implemented yet. Therefore, the second part of this recommendation has not been fulfilled.

- Recommendation: *Consider and prioritise the use of green infrastructure and/or natural water retention measures that provide a range of environ-mental (improvements in water quality, prevention of diffuse pollution from agriculture, flood protection, habitat conservation etc.), social and economic benefits which can be in many cases more cost-effective than grey infrastructure.*

Assessment: KTM23 on Natural Water Retention Measures is applied in four of eight RBDs to address hydromorphological pressures related to agriculture and flood protection. Examples of Natural Water Retention Measures included are restoration of flood meadows and flood forests as well as constructed wetlands in agricultural areas. However, no information was found on a

strategy that prioritises the implementation of Natural Water Retention Measures and green infrastructure measures. Therefore, this recommendation is considered partly fulfilled.

Topic 14 Economic analysis and water pricing policies

14.1 Assessment of implementation and compliance with WFD requirements in the second cycle and main changes in implementation and compliance since the first cycle

For most issues - definition of water services, contribution of water uses to cost recovery, cost recovery calculations and subsidies, environmental and resource costs - there has been no progress since the first cycle. The RBMPs mention that the economic analysis has been updated, but no reference is made to changed methodologies.

Slight progress can be noted with regard to cost recovery rates, which were provided for water supply and sewage combined in the second cycle.

14.2 Progress with Commission recommendations

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

- Recommendation: *Finland should apply a broad definition of water services including water services such as storage, abstraction, and impoundment for the purpose of article nine implementation, to ensure also self-services are included and water uses such as navigation are considered. Finland should present the calculation for the contribution of different water uses disaggregated at least into households, industry and agriculture to cost recovery of water services (broad definition). The cost recovery calculation should include environmental and resource costs valuated on the basis on a robust methodology, with a transparent approach to subsidies and cross-subsidies. Finland should provide precise information concerning incentive function of pricing policy, especially in the respect of application of metering, volumetric charging or efficiency promoting tariffs within different water uses.*

  Assessment: Water services have again been defined in a narrow way (only water supply and sewage services). Other uses such as self-services and navigation are not included in the definition. It is not explained why these two have been selected and others that are connected to significant pressures have not. Article 9(4) was not used.

  For example, according to the Kokemäenjoki-Archipelago Sea-Bothnian Sea RBMP, the most significant pressures are point sources, diffuse sources, water uptake and

hydromorphological pressures. Major activities related to those are agriculture, hydropower and industry, which are not considered water services. In information reported to WISE (for the RBD Kokemäenjoki-Archipelago Sea-Bothnian Sea) the following sectors are mentioned in relation to drivers: agriculture - land drainage, energy - hydropower, flood protection, industry supply, transport -navigation/ports, urban development - drinking water supply. Of these, only drinking water supply is included in the definition of water services. Also, it is not explained which water uses have been identified for Article 9 purposes, in order to establish their contribution to cost recovery.

Cost recovery rates are provided for water supply and sewage services combined.

The calculation was done for the second cycle as a consulting project for the whole country, but the results are presented at the RBD level. The data is collected from the financial statements (of the year 2011) of a sample of 156 water supply organizations. The costs included are: Material and service costs, labour costs, depreciation and impairment losses, other operating expenses, capital costs, other costs. It is explained that the water fees from all users (basic fee and use fee for both water and wastewater plus a connection charge) are supposed to cover the costs. It is unclear whether the calculation of cost recovery contributions from water uses such as agriculture was done, including whether and how "adequate contribution" was identified. Subsidies are not shown explicitly in the calculations.

Environmental and resource costs are not included in the calculation of cost recovery rates.

Finland did not provide precise information concerning incentive function of pricing policy, especially in the respect of application of metering, volumetric charging or efficiency promoting tariffs within different water uses.

The Polluter Pays Principle is not mentioned.

Overall, the recommendation has not been fulfilled.

Topic 15 Considerations specific to Protected Areas (identification, monitoring, objectives and measures)

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

Protected Areas types associated with surface waters are both identified and characterized and include those designated under Article 7 of WFD (Drinking Water Protected Areas, Bathing Water, Birds, Habitats and economically significant species). None were identified in relation to the Nitrates or Urban Waste Water Treatment Directive as a whole territory approach is adopted for the implementation of these Directives in Finland. For groundwaters, Protected Areas related to Drinking Water and Habitats have been identified (Table 15.1).

Table 15.1 Number of Protected Areas of all types in each RBD of Finland, for surface and groundwater

Protected Area type	Number of Protected Areas Associated with[64]			
	Rivers	Lakes	Coastal	Groundwater
Abstraction of water intended for human consumption under Article 7	19	43	2	2 068
Recreational waters, including areas designated as bathing waters under Directive 76/160/EEC[65]	14	177	82	
Protection of species where the maintenance or improvement of the status of water is an important factor in their protection, including relevant Natura 2000 sites designated under Directive 79/409/EEC (Birds)[66]	83	111	72	
Protection of habitats or species where the maintenance or improvement of the status of water is an important factor in their protection, including relevant Natura 2000 sites designated under Directive 92/43/EEC (Habitats)[67]	145	152	120	61
Areas designated for the protection of economically significant aquatic species	10	11		

[64] Finland subsequently informed the Commission that the reported information was not accurate. This table reflects the updated/corrected data

[65] Directive 2006/7/EC of the European Parliament and of the Council of 15 February 2006 concerning the management of bathing water quality and repealing Directive 76/160/EEC http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32006L0007

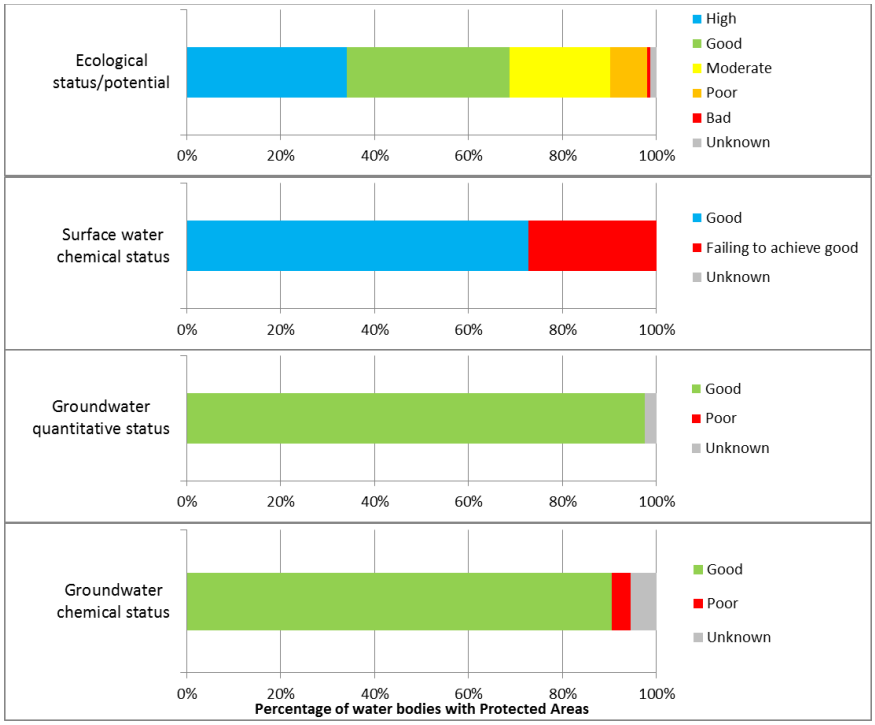
[66] Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32009L0147

[67] Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:31992L0043

Source: Member States reporting to WISE

A good overview of the status of water bodies associated with Protected Areas is reported (Figure 15.1).

Figure 15.1 Status of water bodies associated with the Protected Areas report for Finland. Note: based on status/potential aggregated for all water bodies associated with all Protected Areas



Source: WISE electronic reporting

Finland reports that additional objectives have been set for Protected Areas designated in relation to Drinking Water, Habitats and Birds in surface waters, but not for those relating to Bathing Water or economically significant aquatic species. For the Habitats and Birds related Protected Areas, Finland reports that some specific water objectives have been set to protect dependent habitats and species but work is still on-going to determine needs.

For Habitats related Protected Areas associated with groundwater bodies, Finland reports that no specific water objectives have been set to protect dependent habitats and species because the achievement of WFD good status is sufficient to achieve favourable conservation status.

In surface waters, specific monitoring was reported for most types of Protected Areas - except for those related to Birds and economically significant species[68].

In groundwater, a significant monitoring programme for Drinking Water Protected Areas has been reported, but no monitoring was reported for groundwater dependent habitats (Table 15.2)[69].

Table 15.2 Number of monitoring sites associated with Protected Areas in Finland

Protected Area type	Number of monitoring sites associated with Protected Areas in[70]			
	Rivers	Lakes	Coastal	Groundwater
Abstraction of water intended for human consumption under Article 7	5	18		244
Protection of habitats or species where the maintenance or improvement of the status of water is an important factor in their protection, including relevant Natura 2000 sites designated under Directive 92/43/EEC (Habitats)[71]	71	102	58	
Recreational waters, including areas designated as bathing waters under Directive 76/160/EEC[72]	9	44	16	

Source: WISE electronic reporting

In relation to additional measures for Drinking Water related Protected Areas, Finland reports that 'there are safeguard zones and there are no plans to change the regulations as a result of this RBMP', for all RBDs except for the Åland RBD where it is stated that 'There are safeguard zones but there will be significant changes to them as a result of this RBMP.'

A closer analyse of the RBMPs has not revealed any information on the implementation of additional measures for any of the types of Protected Area except for the use of safeguard

[68] Finland subsequently informed the Commission that it was not possible to report electronically in the Monitoring Schema, as in Annex 8i, enumerations for birds and fish were missing. Birds were reported with enumeration "HAB – Protection of habitats or species depending on water - WFD Annex IV.1.v".

[69] Finland subsequently informed the Commission that monitoring of habitats is made according to the Habitats Directive, and groundwater monitoring (chemical and quantitative) is based on the WFD and the groundwater Directive. No option for directly reporting monitoring of Groundwater dependant habitats was available in the WISE reporting.

[70] Finland subsequently informed the Commission that the reported information was not accurate. This table reflects the updated/corrected data

[71] Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:31992L0043

[72] Directive 2006/7/EC of the European Parliament and of the Council of 15 February 2006 concerning the management of bathing water quality and repealing Directive 76/160/EEC http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32006L0007

zones, where two unspecified measures are mentioned (strategies for the protection of Drinking Water areas and protection of groundwater areas). This is consistent with the objectives set for Habitats related Protected Areas, as the needs of water dependent features are yet to be determined for surface waters and as good quantitative and chemical status of groundwater bodies is sufficient to meet objectives for groundwater dependent habitats.[73]

Exemptions have been applied to a small number (approximately 4 %) of groundwater areas, mainly related to Drinking Water abstraction and mainly due to technical feasibility.

15.2 Main changes in implementation and compliance since the first cycle

Reporting of Protected Area types in the first cycle was not clear though the reporting of monitoring sites associated with Protected Area types indicated that most types of Protected Area had been identified. In the first cycle, the only information reported was the number of drinking water related Protected Areas (2302), which is similar to the number reported in the second cycle.

The reported monitoring activities for each Protected Area type were similar to that in the first cycle. Monitoring of Protected Areas related to Birds and economically significant species could not be explicitly reported in the second cycle but was reported under monitoring for the other Protected Area types.

15.3 Progress with Commission recommendations

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

- Recommendation: *Clarify any reasoning for exemptions and explain the measures that have been put in place for Drinking Water.*

  Assessment: The only information provided on this issue was that safeguard zones are in place and there are no plans to change the regulation as a result of this RBMP. Two unspecified measures were mentioned in relation to safeguard zones – strategies for the protection of drinking water areas and protection of groundwater areas.

  This recommendation has not been fulfilled.

[73] Finland subsequently clarified that some specific water objectives have been set to protect water dependent habitats and species, but work is still on-going to determine needs, and that specific water objectives set to protect water dependent habitats and species are met.

- Recommendation: *Approve additional more stringent standards in the RBMP's for water bodies that appear eutrophic but need to comply with Bathing and Habitats directives.*

  Assessment: No information was reported for Bathing Water related Protected Areas on this issue. For Habitats it was reported that "work is still on-going to determine the needs".

  This recommendation has been partially fulfilled.

Topic 16 Adaptation to drought and climate change

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

All Finnish RBDs recognised the existence of local or sub-basin drought spells as one of the effects of climate change. These appear to be of low concern as no Article 4(6) exemptions have yet been requested due to prolonged droughts. Even though there is no legal obligation to prepare Drought Management Plans, many Member States have prepared them in order to cope with droughts. None of the RBDs has developed a drought management plan. Such drought management plans or elements were not included in the first planning RBMPs either.

Climate change was considered in various ways in all RBDs and it was stated that the guidance on how to adapt to climate change (Common Implementation Strategy Guidance Document No. 24) was used. Specific climate change aspects were considered when selecting robust adaptation measures, checking the effectiveness of measures and assessing direct and indirect climate pressures. Climate change was also considered in flood risk and drought management when dealing with water scarcity. KTM24 - "Adaptation to climate change" has not been applied to tackle pressures in any RBD. However, there are national measures mapped against KTM24 in the RBMPs. No specific sub-plans addressing climate change were reported for Finland.

16.2 Main changes in implementation and compliance since the first cycle

While in the first cycle no specific measures related to climate change are mentioned, it is now indicated that specific climate change aspects have been considered when selecting robust adaptation measures.

16.3 Progress with Commission recommendations

There were no Commission recommendations based on the first RBMPs and Programme of Measures.