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Second River Basin Management Plans – Member State: Ireland

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Acronyms

and

definitions

EQS Directive	Environmental Quality Standards Directive
FD	Floods Directive
Km	Kilometre
km ²	Kilometre squared
KTM	Key Type of Measure
PoM	Programme of Measures
RBD	River Basin District
RBMP	River Basin Management Plan
WFD	Water Framework Directive
WISE	Water Information System for Europe
Annex 0	Member States reported structured information on the second RBMPs to WISE . 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.

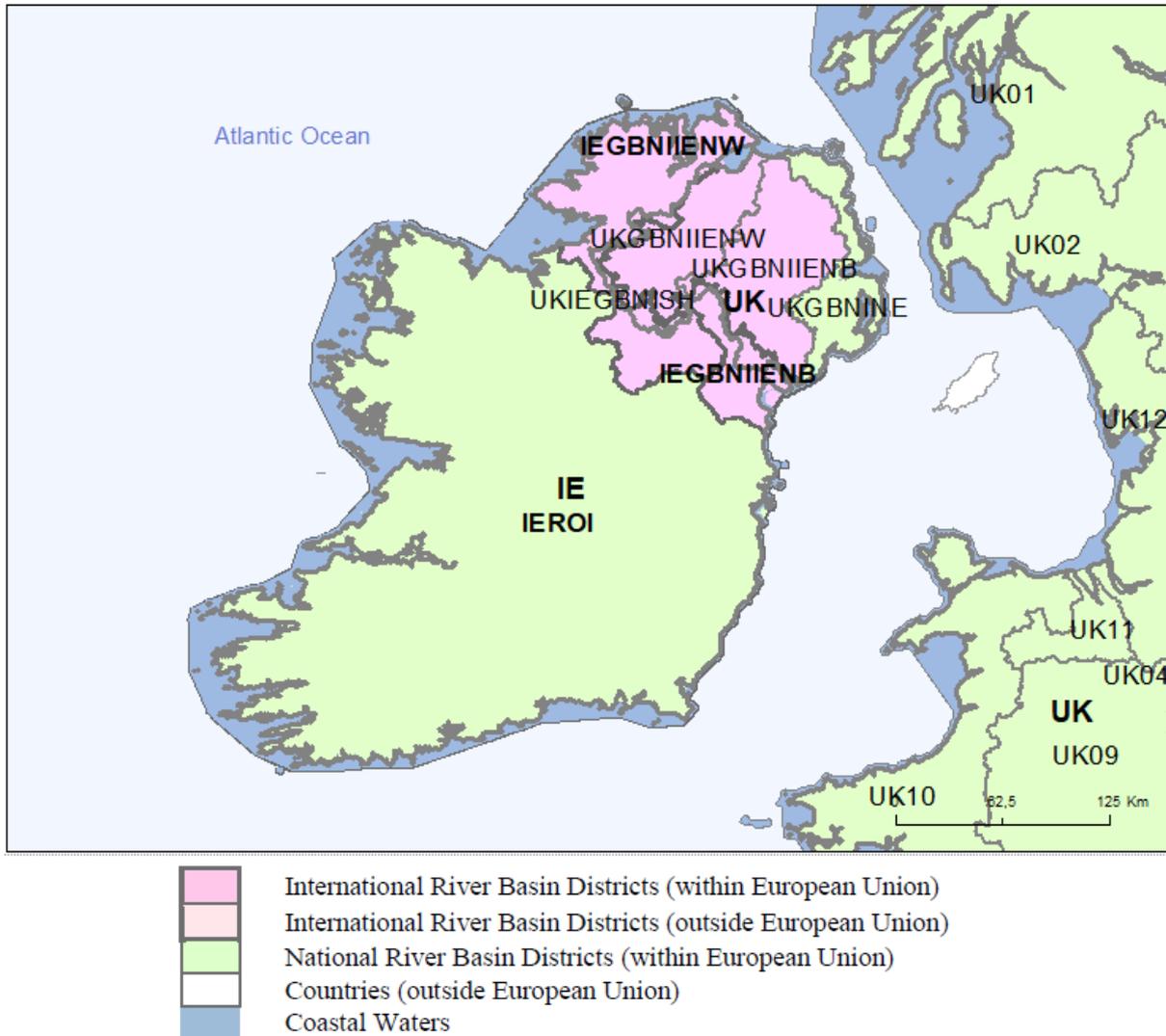
This Member State Assessment report was drafted on the basis of information that was reported by Member States through the Water Information System for Europe (WISE) electronic reporting.

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

General Information

The Republic of Ireland (hereafter Ireland) has a population of 4.90 million¹ and an area of 70,000 km².

Map A - Map of River Basin Districts



Source:

WISE, Eurostat (country borders)

Ireland has three RBDs, two of which (Neagh Bann and North Western) are international RBDs.

Information on areas in the national RBDs, including countries sharing parts of the entire RBD, is provided in Table A.

¹ Eurostat 2019.

Table A: Overview of Ireland's RBDs

RBD	Name	Short name ²	Size ³ (km ²)	Countries sharing RBD
IEGBNIIENB	Neagh Bann	Neagh Bann	14 673.98	UK
IEGBNIIENW	North Western	North Western	8 377.33	UK
IEROI	Republic of Ireland	Republic of Ireland	71 945.79	

Source: WISE electronic reports

The share of Ireland in the respective international RBDs is 63.9% (Neagh Bann) and 36.3% (North Western), as shown in Table B.

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

Name of the international river basin	National RBD	Countries sharing RBD	Coordination category	
			2	
			km ²	%
Neagh Bann	IEGBNIIENB	UK	14 673.98	63.9
North Western	IEGBNIIENW	UK	8 377.33	36.3

Source: WISE electronic reports

Category 1: International agreement, permanent cooperation body and international RBMP in place

Category 2: International agreement and permanent cooperation body in place

Category 3: International agreement in place

Category 4: No formal cooperation formalised.

² The short name for each RBD is used throughout this report.

³ Area includes coastal waters.

Status of second river basin management plan reporting

Individual RBMPs for the Republic of Ireland's three RBDs were reported on 28 August 2018. A national RBMP was reported on 18 September 2018.

Documents are available from the European Environment Agency (EEA) 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 Ireland's second RBMPs are as follows:

- **Governance and public consultation**

- Ireland has reformed its governance framework to improve its implementation of the WFD. This reform should allow for a more coordinated approach to implementing the WFD at both national and local level.
- In developing its second national RBMP, Ireland has carried out extensive public consultations. This has influenced several instruments and measures that have been incorporated into the plan.
- In the first cycle, Ireland designated three RBDs as international (Shannon, North Western and Neagh Bann), whereas it designated only two international RBDs in the second cycle (Neagh Bann and North Western). While RBMPs were developed for all seven RBDs during the first cycle, these RBDs have been consolidated into one national RBMP (Ireland) to ease administrative and reporting requirements. The second RBMP focuses on the national level, including the water bodies that are situated in the Irish part of the two international RBDs.
- Ireland did not adopt and publish the RBMPs in accordance with the timetable in the WFD.

- **Characterisation of the RBD**

- Ireland has made a significant effort to re-delineate and re-classify surface water and groundwater bodies as part of the change from seven RBDs to three RBDs. Overall, there has been a 24% decrease in the number of delineated surface water bodies compared to the first cycle. The number of river water bodies, which make up the significant majority of all delineated water bodies, has decreased by 30% compared to the first cycle. Other water bodies have seen slight increases of 1% (lakes), 2% (coastal waters), and 3% (transitional waters). While some detail is provided on the reasons for changing the delineation of certain water bodies, there is a lack of detailed information on the changes to the characterisation and delineation of water bodies between the first and second cycle.
- International RBDs in the first cycle were classified as category one, as RBMPs were in place for the North Western, Neagh Bann and Shannon international RBDs. However, no RBMPs are in place for the two international RBDs (North Western and Neagh Bann) during the second cycle – although Ireland's second RBMP covers water bodies situated in the Irish part of the international RBDs. These RBDs are therefore now under coordination category 2 ('cooperational agreement, cooperative body in place'). In addition, the designation of transboundary water bodies remains unclear, with Ireland reporting three water bodies in the 'national' Ireland RBD as transboundary (one river and three groundwater bodies).
- Diffuse pollution from agriculture affects 81% of groundwater bodies. In relation to surface water bodies, anthropogenic pressure represents the most significant pressure, affecting 23% of all surface water bodies. A comparison between the first cycle and the second cycle

shows that pressures affecting surface water bodies have decreased in relation to point source, but increased in relation to diffuse sources and hydromorphological pressures⁴.

- Nutrient pollution represents the highest significant impact across all surface water bodies (24% of which are affected) and groundwater bodies (11% of which are affected).
- Twenty-four different pressure types were reported in Ireland, and 23 different pressure types were identified for groundwater bodies. Six priority substances are identified as preventing surface water from achieving ‘good’ chemical status, while seven priority substances are preventing groundwater bodies from achieving this status.
- Indicator gaps have been reported across all three RBDs for: isoproturon, lead, mercury, nickel, cadmium and hexachlorobutadiene; point source pollution from urban wastewater, IED and non-IED plants; diffuse pollution from urban run-off, agriculture, forestry, and unconnected sewage discharges; abstraction or flow diversion – public water supply, physical alterations for flood protection and agriculture, unknown or obsolete dams, barriers and locks, introduced species and diseases, and other or anthropogenic pressures.
- In accordance with EU CIS Guidance Document No 28, an inventory of emissions has been reported for all three RBDs, but not all substances were included in this inventory. A total of 20 substances were included for each of the three RBDs.
- **Monitoring, assessment and classification of ecological status**
 - In the first cycle, Ireland was told that it needed to fully develop its monitoring programmes, since it had not included all quality elements and had not fully implemented coastal and estuarine monitoring programmes. Since then, the monitoring programme for WFD implementation in Ireland has undergone a major review. Data is now available on biological and physio-chemical quality elements, but not on hydromorphological conditions.
 - Ireland reported that 20 sites relating to river bodies were part of an international network. Both international RBDs (Neagh Bann and North Western) are reported as having monitoring programmes in place.
 - Biological quality elements that are used to classify surface water bodies in Ireland have not changed between the first and second cycle for rivers. Other categories of water bodies have seen the introduction of additional biological quality elements, including ‘other aquatic flora’ (lakes, coastal and transitional waters), phytobenthos (lakes), angiosperms (transitional waters) and benthic invertebrates (coastal and transitional waters). Hydromorphological quality elements are still not monitored, although plans are underway to ensure that such elements are monitored by the third cycle.

⁴ Ireland subsequently informed the Commission that significant pressures were incorrectly reported for unmonitored surface water bodies where status was unassigned and they were not in the category of ‘At Risk’ of failing their environmental objectives. For a fuller explanation see footnote **Error! Bookmark not defined.** below.

- River basin specific pollutants discharged in significant quantities in the river basin or sub-basin are monitored at each surveillance monitoring site at three-month intervals, in accordance with Annex V of the WFD.
- In terms of ecological status/potential, 15% of surface water bodies were classified as having a ‘high’ water status in the second cycle, and 31% were classified as ‘good’. This compares to 54% of surface waters achieving ‘good or better’ status in the first cycle.
- There is a high or good level of confidence in the classification of ecological status in 28% of surface water bodies, and for 14% of surface water bodies there is moderate confidence. For 25% of surface water bodies, the confidence rate is unknown.
- There has been an overall decrease in the number of water bodies with less than good status in Ireland. During the first cycle, 42% of all surface water bodies were categorised as being less than good, compared to only 30% during the second cycle – although 25% were classified as ‘unknown’.
- The same assessment methods and classification of biological quality elements are in place for all three RBDs in Ireland. For river bodies, methods (q-value and fish classification scheme 2) are in place to assess benthic invertebrates and fish in river bodies. Biological quality elements were not fully developed in the first river basin planning cycle, with biological quality elements missing for rivers (macrophytes, phytobenthos, fish), lakes (phytobenthos, benthic invertebrates, fish), transitional (phytoplankton, angiosperms, benthic invertebrates, fauna and fish), and coastal waters (benthic invertebrates).
- In Ireland, 66% of surface water body types are linked to common intercalibration types. Methods to assess biological quality elements have been developed since Ireland’s monitoring programme for the WFD started in 2006.
- Ireland did not report on hydromorphological conditions⁵.
- Ireland has reported on standards for 16 general physiochemical quality elements in rivers, lakes, coastal and transitional waters.
- Ireland reported on environmental quality standards for 15 different river basin specific pollutants; 13 of these 15 environmental quality standards are reported for all water body categories, while chromium 3+ is only reported for rivers and lakes. Moreover, environmental quality standards have only been established for water, not for sediment or biota. River basin specific pollutants were used to classify ecological status/potential for all water category types; of these pollutants, zinc, copper and chromium 3+ are reported as preventing good ecological status/potential.
- The ‘one out, all out’ principle has been used for all three RBDs in Ireland.
- **Monitoring, assessment and classification of chemical status in surface water bodies**

⁵ Ireland subsequently informed the Commission that hydromorphology was assessed but not reported due to an error in reporting. For a fuller explanation see footnote 38 below.

No data was reported to WISE on the coverage and frequency of monitoring related to Article 3.3 of the EQS Directive (version in force in 2009). Member States must monitor 14 priority substances that tend to accumulate in sediment and/or biota, to assess long-term trends⁶.

- Surveillance network sites are used to monitor chemical status in surface waters – rivers (6%), lakes (4%), transitional (6%) and coastal (3%).
- Mercury, hexachlorobenzene and hexachlorobutadiene are now among the substances being monitored in biota to assess chemical status.
- The percentage of surface water bodies in Ireland with good chemical status fell from 28% to 7% between the first and second cycle. However, it is suggested that 92% of surface waters will achieve good chemical status in 2015; there is a need to clarify the reasons for these significant changes.
- **Monitoring, assessment and classification of quantitative status of groundwater bodies**
 - While there is detailed data for the Ireland RBD and the Neagh Bann international RBD from monitoring groundwater bodies, limited data is available for the North Western international RBD. This is due to a limited number of groundwater abstractions and the limited risk of groundwater bodies within the North Western international RBD failing to meet their WFD environmental objectives.
 - The number of groundwater bodies assessed as achieving good quantitative status has remained high, with 99.8% achieving this status and only one failing to do so; 9% of groundwater bodies are monitored for quantitative status, which reflects the bodies most at risk from groundwater abstraction.
- **Monitoring, assessment and classification of chemical status of groundwater bodies**
 - The number of groundwater bodies achieving good chemical status rose from 85% in the first cycle to 91% in the second cycle. This now means that 99% of the area of groundwater bodies have a good chemical status.
 - It is difficult to compare operational and surveillance monitoring between the first and second RBMPs, as no data on monitoring is available in WISE for the North Western International RBD in the second cycle.
- **Designation of Heavily Modified and Artificial Water Bodies and definition of Good Ecological Potential**
 - There has been a slight increase in the number of water bodies that have been designated as heavily modified in the second RBMP (no water bodies are categorised as artificial).

⁶ Ireland subsequently informed the Commission that biota monitoring of some substances (mercury, hexachlorobutadiene, hexachlorocyclohexane) has been performed but data not included in the electronic reporting.

- For four of the river water bodies that were designated as heavily modified in Ireland's RBD, two were designated as heavily modified due to flood protection; the other two were designated on the basis of drinking water supply and nature protection and other ecological uses. For lakes, 19 water bodies were designated as heavily modified on the basis of hydropower (10) and drinking water supply (9). The main uses for which transitional water bodies were designated as heavily modified were navigation/ports (8), urban development (1) and 'other' uses (1). Only three coastal waters were identified as heavily modified as a result of 'other' uses (1) and navigational ports (2).
- The Department of Housing, Planning and Local Government aims to have a statutory control regime in place to manage activities affecting the physical condition of the water environment by the third RBMP. Preparatory work is underway by the Environmental Protection Agency, in cooperation with other bodies, to further develop systems to assess hydromorphological conditions. They aim to have a more comprehensive and objective means to measure distance from natural conditions and to decide on whether a water body is significantly modified.
- Ireland defines 'good ecological potential' in all three RBDs using the Prague Approach, which bases the definition on identifying mitigation measures. Good ecological potential was reported to have been defined in terms of biology, from which biological values were derived.
- Some methods for assessing biological quality elements in river, coastal and transitional waters are reported as being sensitive to hydrological and morphological changes in Ireland's three RBDs, but there is no mention of river continuity.
- Mitigation measures (fish ladders, habitat restoration, building spawning and breeding areas, setting of ecological flows, operational modifications for hydro-peaking, and restoration of modified bed structure) have been reported for all three RBDs.
- **Environmental objectives and exemptions**
 - Ireland adopted a prioritisation plan for the second RBMP. This aimed to deepen knowledge of how to characterise exemptions and to strategically address the number of exemptions in order to attain the WFD's environmental objectives.
 - A slight reduction in the number of exemptions under Article 4(4) has been achieved, from 1 690 in the first RBMP to 1 426 in the second RBMP. However, exemptions under Article 4(5) have increased from one in the first cycle to eight in the second cycle. Point source pollution from contaminated or abandoned sites has been identified as the main pressure source justifying the call for these exemptions.
- **Programme of Measures**
 - Ireland has adopted a wide range of measures to achieve the WFD's environmental objectives. This includes an investment of EUR 1.7 billion by Irish Water in over 250 wastewater treatment projects between 2017 and 2021. There are also plans in place to significantly cut leakage, to 37% by 2021.
 - Ireland has also introduced a series of measures to improve local and national institutions' ability to implement the WFD, including: a new agricultural sustainability support and advisory programme, consisting of 30 sustainability advisers, to promote best farming

practices; a dairy sustainability initiative designed to reach 18 000 dairy farmers; and 43 new specialist staff to carry out scientific assessments of water bodies and lead on local implementation measures.

- There has been an increase in the number of Key Type Measures (KTMs) and a concerted effort to align these measures with significant pressures. However, the timing and funding of these measures remains unclear.
- **Measures related to abstractions and water scarcity**
 - Only a few water bodies are deemed to be at risk from water abstraction, which is not considered to be a significant pressure in Ireland.
 - The quantitative status of groundwater bodies from the first to the second RBMP has remained largely unchanged, with only one groundwater identified as having poor quantitative status in the second RBMP.
- **Measures related to pollution from agriculture**
 - There is a clear link between agricultural pressures and agricultural measures. Agriculture constitutes a significant pressure in approximately 53% of the ‘at risk’ water bodies due to excess nutrients, chemicals (including pesticides), and sediment loss (due to poor land management). The significant pressures on water resources as a result of agriculture are given considerable attention within the second RBMP, as well as the development of a suite of measures to address these pressures.
 - Implementation of basic measures under Article 11 (3) (h) to control diffuse pollution from agriculture at source is ensured in all RBDs and the same rules apply across the whole RBD.
 - Ireland has in place a Nitrates Action Programme (2018-2021) with strengthened measures that focus on intercepting and breaking nutrient transport pathways and on preventing sediment and nutrient losses to waters; the programme is enforced through an integrated (water quality and agriculture) ‘whole territory approach’. In addition, Ireland has a derogation to the Nitrates Directive, which allows farmers to farm at higher stocking rates (from 170kg/ha livestock manure to 250kg/ha each year), subject to implementing stricter conditions to protect the environment.
 - Ireland has declared safeguard zones around drinking water protection areas, according to the Nitrates Directive, although there will be significant changes to them as a result of the second RBMP.
 - There are also clear opportunities for farmers to engage in the process through the development and implementation of the RBMP (see section 1). However, the technical feasibility, acceptance and funding of these measures is not easy to discern from the RBMP.
 - There is secure financing in place for the agricultural measures.
- **Measures related to pollution from sectors other than agriculture**
 - There has been an increase in the number of KTMs to address cross-cutting sectoral issues, as well as sectors other than agriculture. Measures have been introduced to improve the

hydromorphological conditions of water bodies, the flow regimes and ecological flows, water efficiency, urban pollution and climate change adaptation.

- Direct discharges to groundwater are prohibited by European Communities Environmental Objectives (Groundwater) Regulations of 2010, and Ireland has measures in place to phase out or reduce emissions of priority substances.
- **Measures related to hydromorphology**
 - All three of Ireland's RBDs have hydromorphological pressures, and Ireland is addressing these pressures through actions such as improving flow regime and sediment management, as well as research to improve the knowledge base. Plans are also in place to change the 'exempted-development threshold' for drainage wetlands from 20ha to 0.1ha.
 - Ecological flows have been derived for some relevant water bodies in all three of Ireland's RBDs, but work is underway to ensure that ecological flows are fully implemented.
 - Ireland reported indicators on the gap to be filled for hydromorphological pressures for 2015 and 2021 for all three RBDs.
- **Economic analysis and water pricing policies**
 - Under the Government's national water pricing policy, commercial users of water have, since 1998, been charged the full cost of providing water and wastewater services. Irish Water plans to establish a new non-domestic tariff framework for water and wastewater services, which will address the issues of having multiple tariff levels, categories, billing methods, billing arrangements and billing cycles.
 - While plans are underway to establish the non-domestic tariff framework and to introduce threshold limits for domestic uses, the current system does not fully align with the 'polluter pays' principle, nor does it go far in incentivising efficient water use.
- **Considerations specific to protected areas (identification, monitoring, objectives and measures)**
 - Ireland has designated protected areas under the relevant Directives for bathing waters, wastewater treatment, shellfish waters, habitats and species.
 - Monitoring sites are in place for all surface waters under the Urban Wastewater Treatment Directive 91/160/EEC and the Nitrates Directive 91/676/EEC. They are also in place for transitional and coastal waters under the Bathing Waters Directive 2006/7EC, and for rivers and groundwater bodies under the Habitats Directive 92/43/EEC.
- **Adaptation to drought and climate change**
 - Ireland has developed a national adaptation framework (NAF) pursuant to the Climate Action and Low Carbon Development Act 2015, which builds upon the 2012 National Climate Change Adaptation Framework, has been developed for Ireland pursuant to the Climate Action and Low Carbon Development Act 2015.
 - While climate change adaptation was considered in the first RBMP, there has been a full integration of climate change adaptation concerns and measures within the second RBMP.

Several aspects relating to climate change were considered within all three RBDs, including flood risk management, assessing direct and indirect climate pressures, checking the effectiveness of measures, preferential selection of robust adaptation measures, and the maximisation of cross-sectoral benefits.

- Ireland has not developed any Drought Management Plans, but intends to do so in the next cycle.

Recommendations

- Ireland needs to ensure that the preparation of the next cycle of RBMPs is carried out in accordance with the WFD timetable, to ensure the third RBMPs are adopted on time.
- Ireland should continue to support the effective operationalisation of its new governance structure in a way that maximises local community engagement in implementing the WFD. This new structure has improved coordination and ensured local engagement.
- Ireland should continue to increase the number of monitoring points to fill the remaining gaps, and should report any activities to monitor hydromorphological quality.
- Ireland should use all relevant quality elements to classify water bodies, in particular biological quality elements, physicochemical quality elements, RBSP and hydromorphological quality elements, where relevant. Confidence in the classification of ecological status should improve in order to address the relatively high percentage of surface water bodies where confidence levels are unknown.
- Monitoring programmes should be further developed to address spatial coverage and frequency in relation to Article 3.3 of the EQS Directive. Ireland should also report on trend assessment.
- Ireland should continue to participate in the intercalibration process with a view to intercalibrating all remaining biological quality elements.
- Ireland should justify and clarify the significant variations in the classification of ‘unknown’ surface water bodies and of ‘good’ chemical status levels in surface water bodies.
- Ireland should address the fact that a large proportion of groundwater bodies are not monitored for their quantitative status.
- Ireland should aim to significantly reduce the number of exemptions in relation to Article 4(4) and 4(5), and should also provide greater transparency and justification for their use.
- The previous recommendations on water pricing policies should be fully implemented. Ireland should ensure that reforms are in place to provide for a transparent and comprehensive framework that: captures the full cost of water services; incentivises efficient water use; and ensures that costs are fully recovered on the basis of the polluter pays principle.
- Ireland should continue to tackle nutrient pollution through such measures as the nitrates action programme and the ‘whole territory approach’, and assess and report on the expected effect of these measures on status. Greater clarity is also needed on the adequacy of the funding measures that are in place to address these agriculture-related pressures.
- A gap assessment to reduce the number of applications of pesticides should be completed and information provided in the RBMP.
- In the third RBMP, Ireland should state clearly to what extent, in terms of area covered and pollution risk mitigated, basic measures (minimum requirements to be complied with) or supplementary measures (designed to be implemented in addition to basic measures) will

help to achieve the WFD objectives. It should also identify sources of funding (e.g. CAP Pillar 1, RDP), as appropriate, to help implement these measures.

- Ireland should report on the cost effectiveness and prioritisation of measures.
- Ireland should pursue its efforts to align key type measures to significant pressures. It should secure funding for the KTMs and provide a timeline for implementing them.
- All river basin specific pollutants and chemical pollutants for surface waters identified as causing failure should be associated with KTMs.
- Ireland should derive and implement ecological flows in all relevant water bodies in all of the three RBDs.
- Ireland should address the fact that the chemical status is unknown for over 80% of surface water bodies with a protected area.

Topic 1 Governance and public participation

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

1.1.1 Administrative arrangements – river basin districts

In Ireland implementation of the WFD is mainly undertaken at the national level. Three RBDs have been identified in Ireland - two of which are international RBDs (Neagh Bann and North Western), with the remaining national RBD comprising the rest of the country. These two international RBDs are both shared with the United Kingdom (Northern Ireland). The national RBD covers the entire territory of Ireland, including those parts of the two international RBDs situated within Ireland.

1.1.2 Administrative arrangements – competent authorities

Ireland reported Competent Authorities across several administrative levels, including five national authorities (Department of Housing Planning Community and Local Government; Environmental Protection Agency; Local Authority Waters Programme; Marine Institute and Waterways Ireland), and 30 local authorities (ie., County Councils of Carlow, Cavan, Cork, Donegal, Dublin City, Dun Laoghaire-Rathdown, Fingal Galway, Galway City, Kildare, Kilkenny, Laois, Leitrim, Limerick, Longford, Louth, Mayo, Meath, Monaghan, Roscommon, Sligo, South Dublin, Tipperary, Waterford, Westmeath, Wexford and Wicklow).

At national level, the Department for Housing, Planning Community and Local Government is responsible for water policy issues, including preparation of RBMPs, public participation and economic analyses. The Environmental Protection Agency, which reports to the Minister of Communications, Climate Action and Environment, takes on responsibilities for the co-ordination of implementation, the monitoring and assessment of the status of surface water and groundwater, the enforcement of regulations, the preparation of the programme of measures, pressure and impact analysis and reporting to the European Commission. Three additional Competent Authorities take on responsibilities at that national level, namely the Local Authority Waters and Communities Office (co-ordination of implementation and public participation), the Marine Institute (enforcement of regulations, pressure and impact analysis, and reporting to the European Commission), and Waterways Ireland (monitoring surface water). At the local level, the aforementioned County & City Councils are responsible for monitoring surface water and the implementation of measures.

A national approach is generally followed in the implementation of the WFD, with some differences in the two international RBDs due to coordination with the United Kingdom. While each jurisdiction has full responsibility for ensuring implementation of all aspects of the WFD in their territory, co-ordination in relation to shared water bodies includes, co-arrangements established by Ministers in both jurisdictions, the establishment of a North/South Water Framework Directive Co-ordination Group under the auspices of the North/South Working Group on Water Quality, the establishment of various technical working groups with joint representation from technical experts within state bodies, and cross-representation on respective national and RBD level groups.

1.1.3 River Basin Management plans – structure (sub-plans, Strategic Environmental Assessment)

No sub-plans were reported for the Republic of Ireland.

A Strategic Environmental Assessment (SEA) screening in relation to the RBMP was undertaken by the Department of Housing Planning Community and Local Government in 2007, and it was determined that an SEA would be required. The SEA, which proposed mitigation measures, was subsequently applied to the RBMP, and influenced the final version.

The RBMP is structured around thirteen main sections, which sets the second RBMP in context and describes the Irish RBD; explains the process in developing the RBMP; reviews measures implemented and outcomes from the first cycle; assesses the current state of the water environment; characterises risks to water bodies including significant environmental pressures; sets out environmental objectives and priorities for the second cycle; describes the measures to be taken to improve water bodies, including in relation to diffuse and point-source pollution, pressures from urban waste-water, forestry, peatlands, invasive and alien species, abstraction, water and land-use planning, flood management, climate adaptation, and hazardous chemicals; highlights specific measures for protected areas and high-status waters; provides an economic analysis of water use; lays out an implementation strategy for the RBMP, as well as communication and public and stakeholder engagement; sets out plans for water quality monitoring; and highlights expected outcomes of the second RBMP.

1.1.4 Public consultation

The Ministry for Housing, Planning and Local Government published the draft RBMP for Ireland on 28th February 2017. Consultation was undertaken for the requisite six-month period. Various media were used to provide the public with an opportunity to provide comments, observations and submissions on the draft RBMP, including dissemination through newspapers, TV, radio, the publication of printed and online material, and social networking outlets. In total, 938 submissions were received directly by the Ministry for Housing, Planning and Local Government via email, post and a short online survey. Additionally, the Water Forum (An Fóram Uisce)⁷ offered a platform for many stakeholders to discuss and debate the draft RBMP, which in turn informed the content of the document that was submitted to the Ministry as part of the process. Local public consultation on the draft RBMP focussed on local water-quality interests and issues, and was organised by the Local Authority Waters and Communities Office, and involved approximately 124 public information meetings, as well as online submissions and telephone conversions. In total, the Local Authority Waters and Communities Office gathered together more than 1,000 submissions from their public consultation.

Through the aforementioned mechanisms a range of stakeholder groups were actively involved in the public consultation on the draft RBMP for Ireland, including industry, consumer groups, agriculture/ farmers, NGOs, nature protection, fisheries/ aquaculture, local and regional authorities, navigation and energy (including hydropower).

⁷ <https://thewaterforum.ie>.

Within the second RBMP, it has been claimed that public consultation has influenced a number of themes, including the state response to improved water management, pressures on water bodies and water quality, the physical condition of surface waters and the value of water bodies. Policy measures related to these themes have resulted in enhanced collaborative mechanisms, including the development of the Water Forum (An Fóram Uisce), the development of a new Community Development Fund, and the Local Authority Waters and Communities Office's, 'Blue Dot Catchment Programme'.

Ireland has reported that public consultation has also influenced several investments, including a €73 million per year initiative by Irish Water⁸ to reduce leakage, €1.7 billion on 255 urban waste-water projects, and the expansion of the grant scheme to assist with the costs of septic tank remediation in high-status water areas and areas of protection. Additional policy measures influenced by the public consultation are claimed to include the introduction of 43 local authority staff carrying out investigative assessments on water bodies; 30 new Sustainability Advisors providing advice and support to farmers in the 190 Areas for Action and across the dairy sector; the realignment of forestry-related regulations, policies and requirements with national water policy; a commitment by Inland Fisheries to assess barriers to fish movement in water bodies; the publication of legislation to develop a register of abstractions and control systems; and the improvement of hydromorphological assessment methods.

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

No joint consultations between the second RBMP for Ireland and Flood Risk Management Plans were carried out.

No joint consultation between the second RBMP for the Republic of Ireland and the Marine Strategy Framework Directive was carried out⁹.

1.1.6 International coordination and co-operation

International RBDs in the first cycle were classified as category one as RBMPs were in place for the North Western, Neagh Bann and Shannon international RBDs. However, no RBMPs are in place for the two international RBDs (North Western and Neagh Bann) during the 2nd cycle. These RBDs are therefore now under co-ordination category 2, namely 'co-operational agreement, cooperative body in place'. The two international RBDs (Neagh Bann and North Western) are co-ordinated based on arrangements between the relevant Ministers in both jurisdictions,¹⁰ as well as the establishment of the North-South Water Framework Directive Co-ordination Group, under the auspices of the North-South Working Group on Water

⁸ *Irish Water* is the national water utility for Ireland which was established pursuant to the Water Services Act of 2013. It is responsible for the management of national water and wastewater assets, the maintenance of the water and wastewater system, investment and planning, managing capital projects, and customer care and billing.

⁹ Ireland subsequently informed the Commission that section 6.5 of Ireland's Flood Risk Management Plan sets out the coordination between the FD and the WFD, but the consultations on the plans were not co-ordinated due to difference in timing.

¹⁰ For the UK the relevant Minister is the Minister for Agriculture, Environment and Rural Affairs, Northern Ireland and for Ireland the relevant Minister is the Minister of Housing, Planning and Local Government.

Quality. Co-ordination also takes place through additional technical working groups with joint representation, and cross-representation within national and RBD level groups.

Ireland reported that there was no international co-ordination on public participation.

1.2 Main changes in implementation and compliance since the first cycle

In the first cycle, Ireland designated RBDs; three of which were international with the UK (Shannon, North Western and Neagh Bann). Only 2.5 km² of the Shannon international RBD is located in the UK. This part of the territory is now included in the North Western international RBD, which means that only two international RBDs have now been designated by Ireland. A consolidation of RBDs has also taken place at the national level, with the Eastern, South Eastern, South Western, Western and Shannon RBDs now forming part of one national RBD (Republic of Ireland).

There have been changes made to the surface/ delineating of RBDs reported. The Neagh Bann international RBD has changed from 8121 km² to 8377 km², and the area of the North Western international RBD has decreased from 14,793 km² to 14,673 km².

During the first cycle, responsibility for implementation of the RBD was split between national and local authorities, with activities in each RBD co-ordinated by a designated local authority. For the second cycle a new governance structure has been introduced, with the Department for Housing, Planning, Community and Local Government taking responsibility for water policy issues, and the Environmental Protection Agency taking on new responsibilities¹¹. Local authorities, under the leadership of the newly formed Local Authorities Water and Communities Office, are now responsible for carrying out and enforcing measures, as well as ensuring for effective public participation, including consultation on the draft RBMP. A number of additional structures have been introduced to support this new governance structure, including the Water Policy Advisory Committee (provides high-level policy direction, and monitors implementation of the RBMP), the National Coordination and Management Committee (oversees work programmes, addresses obstacles to implementation, and advises on future policy needs), the National Technical Implementation Group (ensures co-ordinated actions at the national level, addresses operational barriers, and reports on the effectiveness of measures and actions taken), and five regional local authority co-ordinating structures.

During the first cycle, Ireland categorised all its international RBDs (Neagh Bann, North Western and Shannon) as category one, whereas in the absence of any international river basin management plan being in place, the international RBDs are now in category two.

¹¹ In July 2014, The Department of Environment, Community & Local Government issued the European Union (Water Policy) Regulations 2014, which gave effect to a new, three tier governance framework for Ireland.

1.3 Progress with Commission recommendations

The Commission recommendations based on the first RBMPs and PoM requested action on the following:

- Recommendation: *Transparency on this whole process within a clear governance structure will encourage public participation in both the development and delivery of necessary measures to deliver sustainable water management.*

Assessment: Changes have been made to the governance arrangements for implementation of the WFD, which have the aim of enhancing public participation both in the development and implementation of the WFD. No RBMPs have been submitted at the individual RBD level – only for the Ireland RBD. The governance structure in place for the international RBDs requires clarification. The 2nd RBMP covers all areas within Ireland, including waterbodies of the two international RBDs that are situated in Ireland. In summary, there has been significant progress on this recommendation but there is room for improvement.

Topic 2 Characterisation of the River Basin District

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

2.1.1 Delineation of water bodies

In Ireland there has been an overall decrease of 24% in the number of delineated surface water bodies compared to the first cycle.

For river water bodies, which make up the significant majority of all delineated water bodies, the number of water bodies has decreased by 30% compared to the first cycle. Other water bodies have seen a slight increase of 1% (lakes), 2% (coastal waters), and 3% (transitional waters).

In the first cycle, river water bodies were delineated based on their physical characteristics. However, it became apparent during the first cycle that the link between water bodies and WFD status was not optimal as long stretches of channel were being inappropriately assigned bad or poor status based on the one out all out rule.¹² Additionally, stretches of channel that had the same status along their length were treated as a single river water body unit. This was rectified during the second cycle, and as a consequence the second cycle river water body network has a stronger relationship to WFD status classification. Also, for the first cycle, small tributaries were omitted, whereas in the second cycle streams that appear on the 1:50,000 discovery series have been included.¹³

¹² Environmental Protection Agency, *River Water Body Typology Classification Methodology*, February 2018, http://cdr.eionet.europa.eu/ie/eu/wfd2016/documents/national/envwtneaw/IE_River_Typology_Classification_Methodology.pdf, at 2.

¹³ Ibid.

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

Year	RBD	Lakes		Rivers		Transitional		Coastal	
		Number of water bodies	Total Area (km ²) of water bodies	Number of water bodies	Total Length (km) of water bodies	Number of water bodies	Total Area (km ²) of water bodies	Number of water bodies	Total Area (km ²) of water bodies
2016	IEGBNIIENB	18.0	6.4	95.0	2331.0	9.0	38.9	4.0	271.9
2016	IEGBNIIENW	237.0	231.9	395.0	11900.1	22.0	131.5	24.0	2362.6
2016	IEROI	557.0	961.8	2702.0	61390.6	164.0	685.6	83.0	10775.0
Total		812.0	1200.1	3192.0	75621.7	195.0	856.1	111.0	13409.5
2010	GBNIIENB	17	37.603	90	558.754	8	51.41	2	102.169
2010	GBNIIENW	226	545.778	682	2476.503	20	128.529	22	2064.27
2010	IEEA	26	65.649	365	1874.359	13	26.642	8	359.515
2010	IEGBNISH	114	510.122	899	5035.836	20	260.385	11	1224.528
2010	IESE	12	41.812	672	3820.691	21	105.904	9	1024.075
2010	IESW	90	281.836	891	3545.414	42	190.336	27	3601.888
2010	IEWE	322	1145.065	966	3725.97	65	269.961	30	4596.536
Total		807.0	2627.9	4565.0	21037.5	189.0	1033.2	109.0	12973.0

Source: WISE electronic reports

Table 2.2 shows the differences in size distribution of surface water bodies in Ireland between the second and first RBMPs. The minimum, maximum and average lengths of rivers increased from the first to the second reporting cycle, with a change in the overall average river length from 4.87 km in the first reporting cycle to 25.79 km in the second reporting cycle. For lakes, the minimum, maximum and average area decreased from the first to the second reporting cycle, with the average going from 3.12 km² to 1.02 km².

Table 2.3 provides a summary of how water bodies have evolved between the two cycles for surface water and groundwater. For surface water, river water bodies have shown the biggest change with a significant number of deletions.

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

Year	RBD	Lake Area (km ²)			River length (km)			Transitional (km ²)			Coastal (km ²)		
		Min	Max	Average	Min	Max	Average	Min	Max	Average	Min	Max	Average
2010	GBNIIENB	0.10	7.59	2.21	0.23	25.49	6.21	0.12	33.35	6.43	38.45	63.72	51.08
2010	GBNIIENW	0.04	22.06	2.41	0.03	35.04	3.63	0.14	59.36	6.43	0.05	735.51	93.83
2010	IEEA	0.13	19.54	2.52	0.12	32.28	5.14	0.18	4.81	2.05	2.34	115.04	44.94
2010	IEGBNISH	0.03	116.50	4.51	0.03	34.90	5.60	0.10	123.07	13.02	0.02	379.34	111.32
2010	IESE	0.12	9.58	3.48	0.04	33.39	5.69	0.35	28.21	5.04	0.11	797.29	113.79
2010	IESW	0.06	19.52	3.13	0.03	42.73	3.98	0.01	50.87	4.53	0.01	1540.30	133.40
2010	IEWE	0.03	115.68	3.56	0.10	33.12	3.86	0.01	17.25	4.15	2.34	1754.10	153.22
2016	IEGBNIIENB	0.01	3.56	0.36	3.12	131.41	24.54	0.00	33.33	4.32	38.43	128.28	67.98
2016	IEGBNIIENW	0.00	57.78	0.98	2.30	133.82	30.13	0.01	59.50	5.98	0.05	740.76	98.44
2016	IEROI	0.00	116.50	1.73	0.61	154.74	22.72	0.00	123.05	4.18	0.01	1753.90	129.82

Source: WISE electronic reports

Table 2.3 Type of change in delineation of groundwater and surface water bodies in Ireland between the second and first cycles

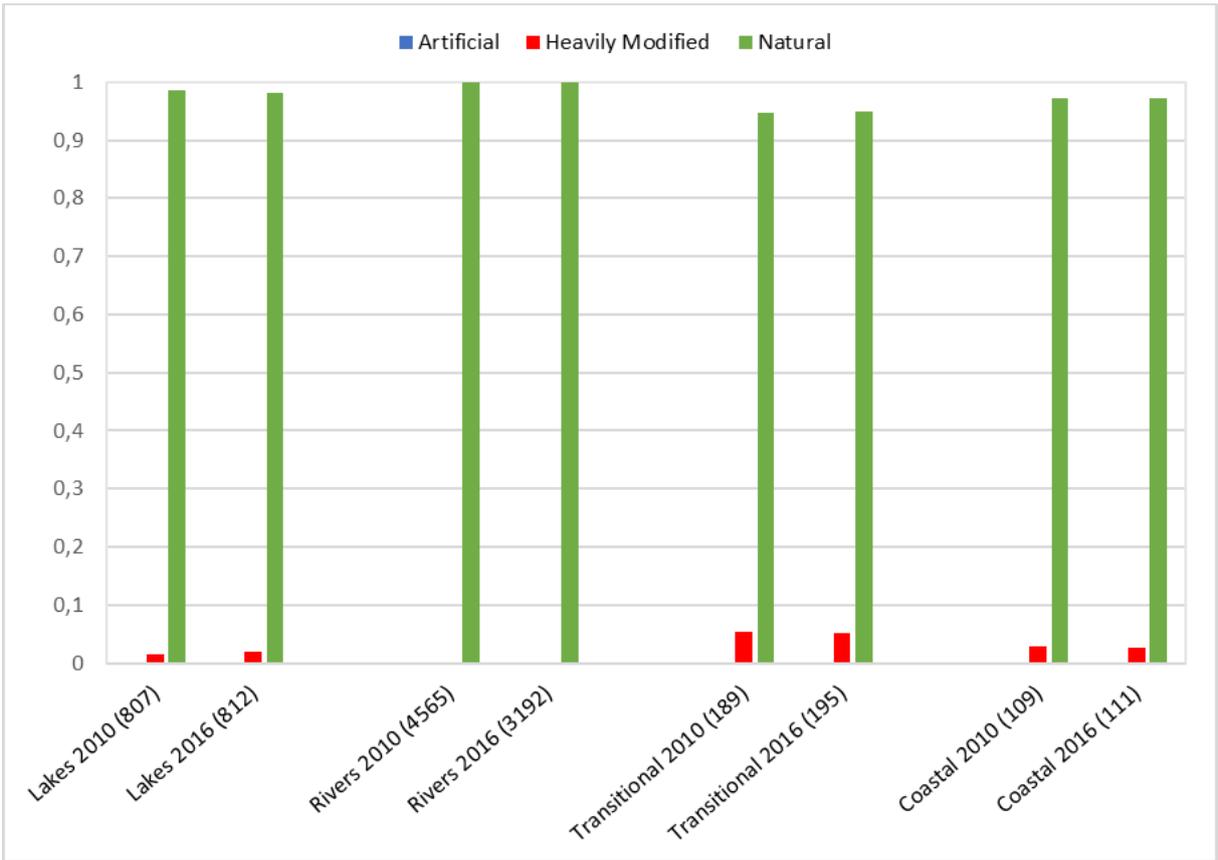
Type of water body change for the second cycle	Lakes	Rivers	Transitional	Coastal	Groundwater
Aggregation	0	0	0	0	0
Change	0	0	0	0	371
Aggregation and Splitting	0	0	0	0	0
Code	0	0	0	0	35
Extended Area	0	0	0	0	0
Reduced Area	0	0	44	78	0
Creation	27	3192	7	4	107
Deletion	26	4564	1	2	350
No Change	779	0	144	29	0
Splitting	6	0	0	0	0
Total water bodies before deletion	838	7756	196	113	863
Delineated for second cycle (after deletion from first cycle)	812	3192	195	111	513

Source: WISE electronic reports

2.1.2 Designation of heavily modified and artificial water bodies

Changes to the designation of heavily modified and artificial water bodies in Ireland are minimal between the first and second cycles. There has been a slight increase in the delineation of heavily modified lakes (1.5% to 2%), whereas the delineation of rivers, transitional and coastal waters have decreased marginally (between 0.1% and 0.2%).¹⁴

Figure 2.1 Proportion of surface water bodies in Ireland 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 reports

2.1.3 Delineation of groundwater bodies

In the first cycle groundwater bodies were delineated primarily based on their physical characteristics and where associated pressures or receptors were to be separately managed, for example, for point sources or wetlands. A full assessment of pressures on groundwater bodies led to changes in the delineation of groundwater bodies for the second cycle, so that not only the physical characteristics but also their likely WFD status was taken into account when

¹⁴ Ireland subsequently informed the Commission that the number of heavily modified rivers in the 1st and 2nd cycles was the same, ie., four, and that canals (14 artificial waterbodies) were included in the RBMP (Table 4.1) but not in the reporting database. They will be included in the reporting database for the 3rd RBMP.

delineating groundwater bodies. This led to a 32% decrease in the number of delineated groundwater bodies from the first cycle to the second cycle. There was a decrease in both international RBDs of 36 % (Neagh Bann) and 15 % (North Western) respectively and the number of groundwater bodies in the Ireland RBD decreased by 22%.

Table 2.4 Number and area of delineated groundwater bodies in Ireland for the second and first cycles

Year	RBD	Number	Area (km ²)		
			Minimum	Maximum	Average
2010	GBNIIENB	28	0.03	1324.84	104.68
2010	GBNIIENW	72	0.07	1431.46	118.73
2010	IEEA	75	0.02	949.09	83.08
2010	IEGBNISH	242	0.03	1302.49	72.71
2010	IESE	151	0.02	1357.81	84.92
2010	IESW	84	0.23	1867.03	133.75
2010	IEWE	104	0.17	1353.71	112.66
2010	Total	756			
2016	IEGBNIIENB	18	1.03	1073.25	122.12
2016	IEGBNIIENW	61	0.42	1467.98	143.89
2016	IEROI	434	0.12	1886.26	139.67
2016	Total	513			

Source: WISE electronic reports

2.1.4 Identification of transboundary water bodies

Ireland reported a total of 99 transboundary waters including coastal, transitional, river and lake water bodies. Rivers make the majority of the transboundary water bodies identified, with 22 in the Neagh Bann RBD, 34 in the North Western RBD, and 1 in the Republic of Ireland RBD. 31 transboundary groundwater bodies are identified within the Neagh Bann RBD, a further 3 are identified within the Republic of Ireland RBD. Both the Neagh Bann and the North Western RBDs each contain 2 coastal waters and 1 transitional water body.

2.1.5 Typology of surface water bodies

The number of different surface water body types has not changed markedly between the first and second reporting cycles. There are 13 river types in both the first and second cycle. Lake types have increased slightly from 13 to 16; transitional waters have remained the same at two; and coastal waters have also remained the same with 4 types. Ireland adopts a system B typology for river types (based primarily on geology and river slope), and lake types (based on altitude, latitude/ longitude, mean depth, geology, size and conductivity)¹⁵.

Member States were asked to report ‘not applicable’ in WISE if there is no corresponding intercalibration type for national types. Overall in Ireland, 9 % of national types did not have corresponding intercalibration types. The majority of these were unclassified types related to lakes (557), with the remaining 26 concerning rivers.

¹⁵ EPA, River Water Body Typology Classification Methodology, p. 2, https://cdr.eionet.europa.eu/ie/eu/wfd2016/documents/national/envwtneaw/IE_River_Typology_Classification_Methodology.pdf; and Working Group on Characterisation and Risk Assessment, Summary Note of Irish Lake Typology to be applied in Ireland’s River Basin Districts, https://cdr.eionet.europa.eu/ie/eu/wfd2016/documents/national/envwtneaw/IE_Lake_Typology_Summary_Guidance.pdf.

With Ireland's revision of RBDs in 2014, two international RBDs shared with Northern Ireland (UK) have been retained. As most of the geographical area of both international RBDs is within the territory of Ireland, little co-ordination has taken place in terms of approaches to characterisation¹⁶. An early co-ordinated assessment of cross-border lakes was conducted¹⁷.

Table 2.5 Number of surface water body types at RBD level in Ireland for the first and second cycles and changes observed.

RBD	Rivers		Lakes		Transitional		Coastal	
	2010	2016	2010	2016	2010	2016	2010	2016
GBNIIENB	9		4		2		1	
GBNIIENW	13		12		2		4	
IEEA	10		10		2		3	
IEGBNISH	13		13		2		4	
IESE	12		1		2		3	
IESW	12		8		2		4	
IEWE	13		13		2		4	
IEGBNIIENB		13		7		2		2
IEGBNIIENW		13		15		2		4
IEROI		12		16		2		4
Total	13	13	13	16	2	2	4	4

Source: WISE electronic reports

2.1.6 Establishment of reference conditions for surface water bodies

In Ireland, no water category type has established reference conditions for all biological, hydromorphological or physicochemical quality elements. Reference conditions have been reported for some biological quality elements in 92 % of river bodies, 92 % of lake bodies, and 100% of both coastal and transitional water bodies. For hydromorphological quality and physicochemical quality elements no reference conditions have been reported. Some physicochemical quality reference conditions have been reported for 100% of coastal transitional waters, but none for hydromorphological quality elements¹⁸.

Table 2.6. Percentage of surface water body types in Ireland with reference conditions established for all, some and none of the biological, hydromorphological and physicochemical quality elements.

Water category	Water types reference conditions established	Biological quality elements	Hydromorphological quality elements	Physicochemical quality elements
Rivers	All			
	Some	92%		

¹⁶ Environmental Protection Agency, 'International River Basin District Rivers Typology Assessment', July 2018,

https://cdr.eionet.europa.eu/ie/eu/wfd2016/documents/national/envwtneaw/IRBD_Typology_Coordination.pdf.

¹⁷ http://cdr.eionet.europa.eu/ie/eu/wfd2016/documents/national/envwtneaw/Harmonisation_of_2010-2012_Status_of_Cross_Border_Lakes.pdf

¹⁸ Ireland subsequently informed the Commission that reference conditions for physio-chemical quality elements in rivers and lakes and some reference conditions for hydromorphology elements are in place.

Water category	Water types reference conditions established	Biological quality elements	Hydromorphological quality elements	Physicochemical quality elements
	None	8%	100%	100%
Lakes	All			
	Some	92%		
	None	8%	100%	100%
Transitional	All			
	Some	100%		100%
	None		100%	
Coastal	All			
	Some	100%		100%
	None		100%	

Source: WISE electronic reports

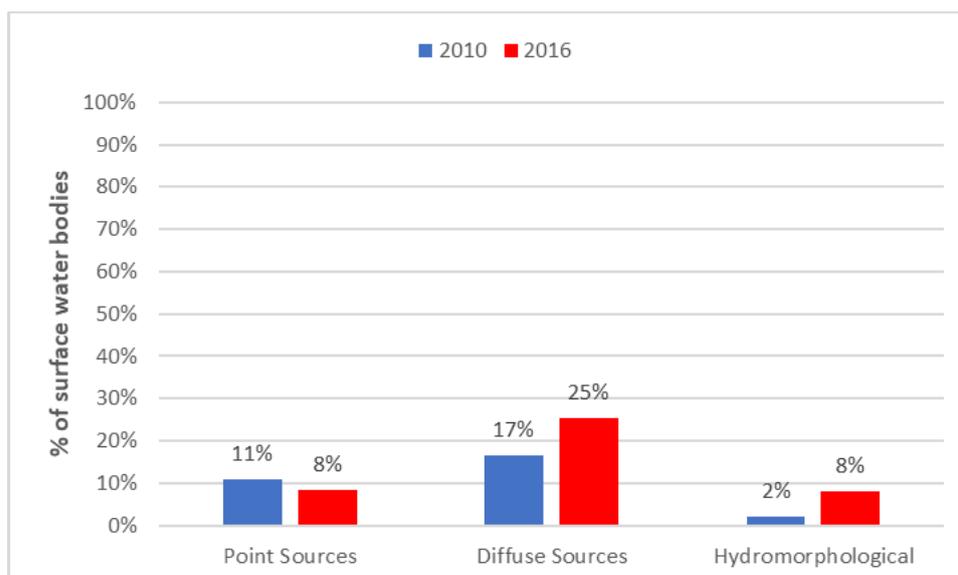
2.1.7 Characteristics of groundwater bodies

In the second reporting cycle, Ireland has reported data on the geological formation of their aquifer types in all three RBDs. In the Neagh Bann international RBD, seven out of 18 groundwater bodies are layered; five of 60 groundwater bodies are layered in the North Western international RBD; and for the Republic of Ireland RBD, 54 out of 434 groundwater bodies are layered. All groundwater bodies were linked to surface water bodies; whereas only 9% of groundwater bodies were linked to terrestrial ecosystems.

2.1.8 Significant pressures on water bodies

In the second RBMP, the significant pressures reported most often were diffuse agricultural (17% of surface water bodies and 81% of groundwater bodies). Significant pressures on water bodies between the first and second cycles have varied slightly, with increases in pressures evident for both diffuse (8%) and hydromorphological sources (6%); whereas there has been a slight decrease in point sources (-3%).

Figure 2.2 Comparison of pressures on surface water bodies in Ireland in the first and second cycles. Pressures are presented at the aggregated level. NB - there were 4310 identified surface water bodies for the second cycle and 5124 for the first cycle



Source: WISE

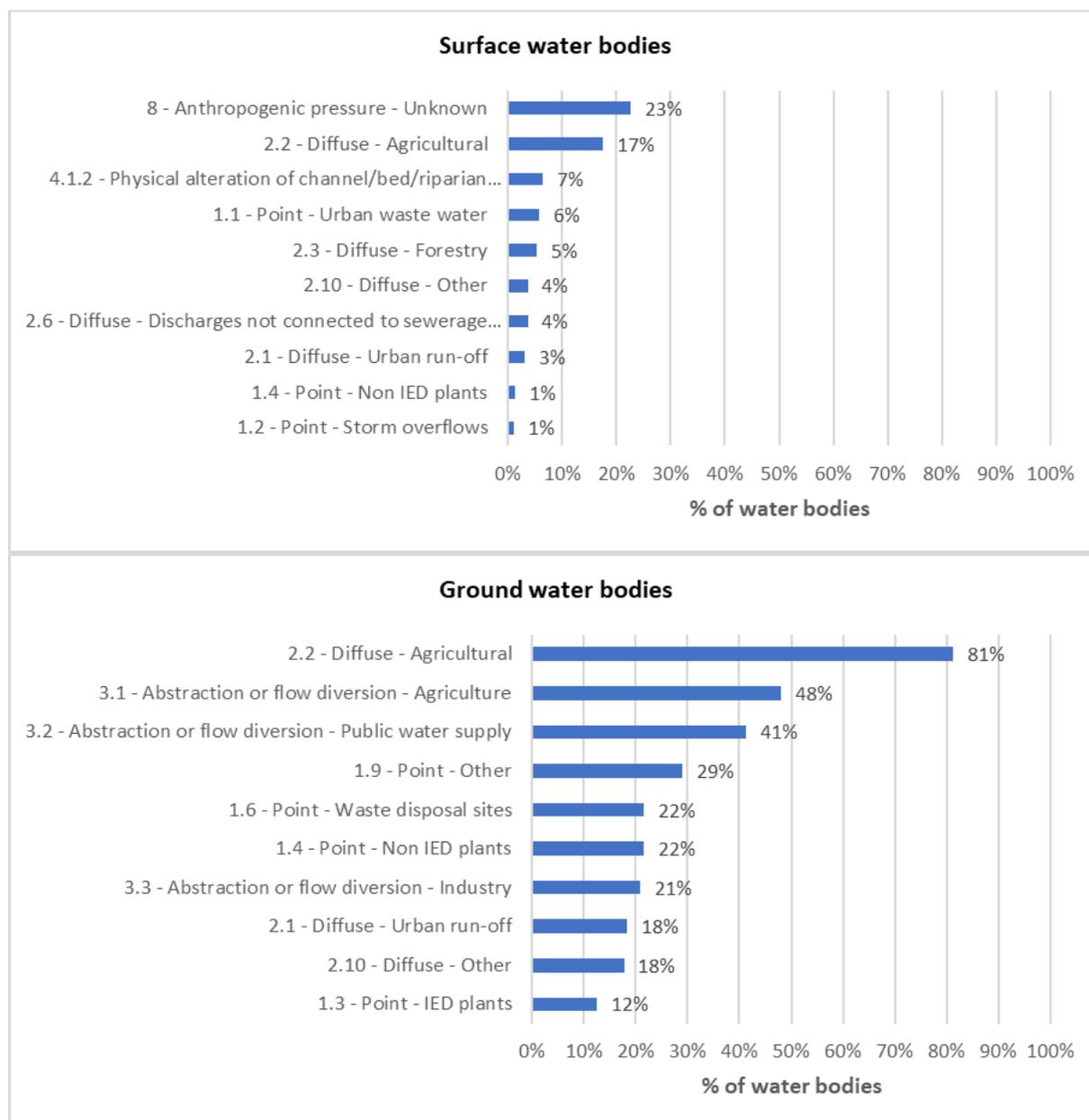
electronic reports

In terms of surface water bodies in Ireland, the reported pressure with the greatest percentage of affected water bodies was anthropogenic pressure (23%), followed by diffuse agriculture (17%)¹⁹.

For groundwater bodies, diffuse agriculture represents the most significant pressure by far (81%), with abstraction or flow diversion for agriculture being the second most significant pressure (48%). Abstraction or flow diversion for public water supply, was only slightly lower (41%) for groundwater bodies.

¹⁹ Ireland subsequently informed the Commission that significant pressures were incorrectly reported for unmonitored surface waterbodies where status was unassigned and which did not have a risk category of 'At Risk' for failing their environmental objectives. This was where most of the category "Anthropogenic pressure – unknown" were reported, and they should not have been included as significant pressures, but rather reported there only where a waterbody was not meeting objectives or was At Risk of not meeting objectives. The numbers presented in the 2nd RBMP reflect the correct number of significant pressures for waterbodies that were At Risk of failing to meet their environmental objectives. The significant pressures impacting on the 1,460 water bodies that were At Risk of not meeting their objectives include, agriculture (53%), hydromorphology (24%), urban waste-water (20%), forestry (16%), domestic waste-water (11%), urban runoff (9%), peat (8%), extractive industry (7%) and mines and quarries (6%).

Figure 2.3 The 10 most significant pressures on surface water bodies and groundwater bodies in Ireland for the second cycle²⁰



Source: WISE electronic reports

2.1.9 Definition and assessment of significant pressures on surface and groundwater

²⁰ Ireland subsequently clarified that these graphs are incorrect due to an error in reporting significant pressures to WISE and that the correct breakdown of significant pressure is detailed in the RBMP.

Significant pressures on surface and groundwater bodies were assessed using a combination of methods. Data analysis and modelling, were combined with evidence, expertise and local information from a range of public bodies²¹.

The European Communities Environmental Objectives (Groundwater) Regulations of 2010 established a new regime for the assessment and protection of groundwater in line with both the WFD and the GWD²². The Regulations require the Environmental Protection Agency to undertake an assessment of pollution trends, including the identification of significant and sustained upward trends in the concentration of pollutants in groundwater bodies or groundwater bodies identified as being at risk of failing to achieve the objectives of the WFD. The Environmental Protection Agency is also responsible for identifying the starting point for trend reversal, which is expressed as a percentage of the relevant groundwater quality standard or TV.²³

2.1.10 Significant impacts on water bodies

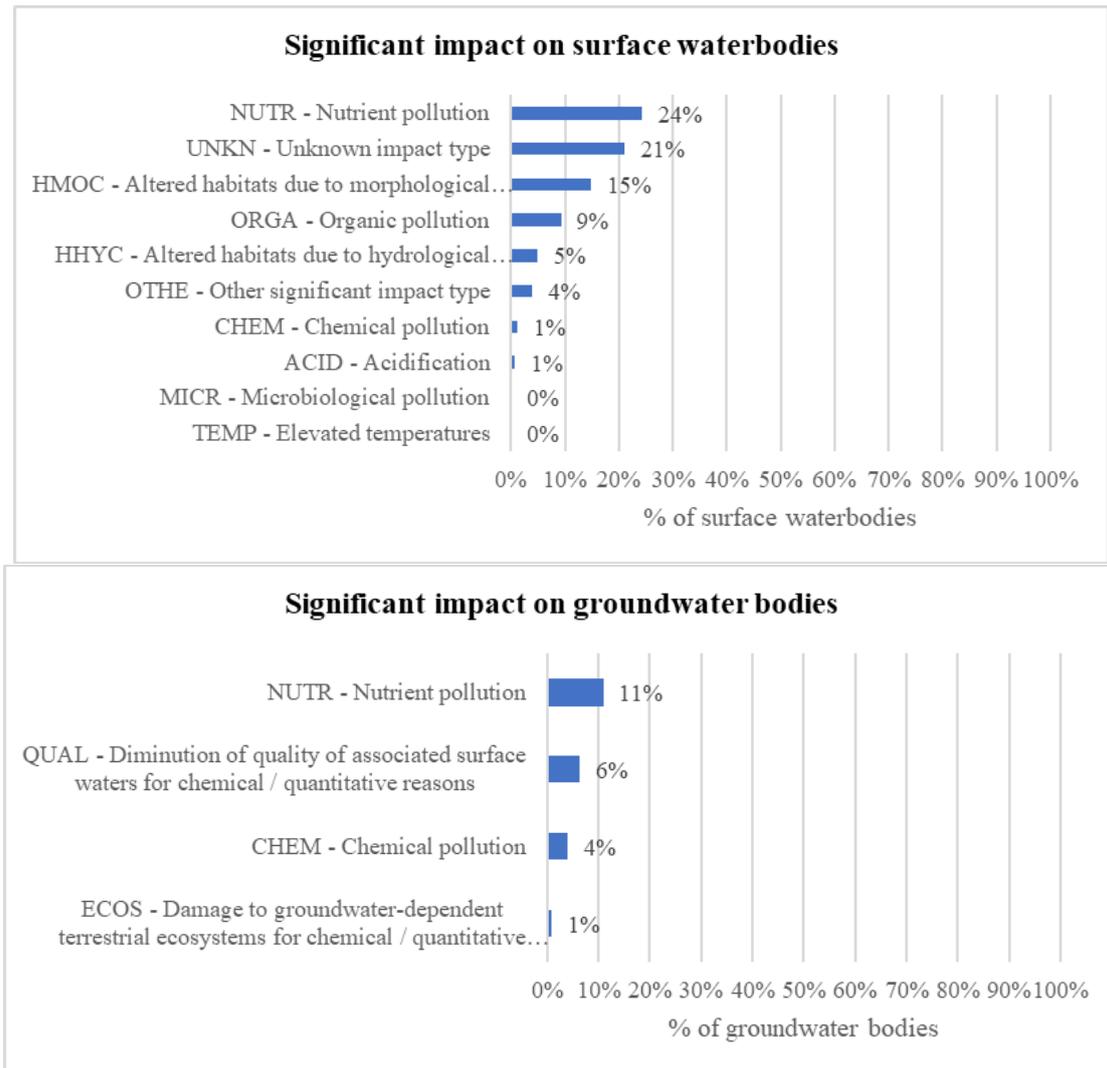
Nutrient pollution (24% of surface water bodies), represents the highest significant impact across all surface water bodies. The highest significant impact across all groundwater bodies was also identified as nutrient pollution (11%). While no direct comparison is available, diffuse source pollution (including from nutrients), was identified a significant pressure in 57% of surface water bodies during the first reporting cycle.

²¹ EPA Catchments Unit, 'Identification of Significant Pressures and Impacts: Methods and Tools' May 2018, https://cdr.eionet.europa.eu/ie/eu/wfd2016/documents/national/envwtneaw/RBMP_Cycle2_Significant_Pressure_s.pdf.

²² S.I 9 of 2010.

²³ Ibid. In developing the methodology, Ireland has relied upon the following: EC, 'Guidance on Groundwater Status and Trends Assessment', CIS Guidance Document no. 18 (2009); UKTAG, 'Groundwater Chemical Classification for the purposes of the Water Framework Directive and the Groundwater Daughter Directive' (2008), http://www.wfduk.org/tag_guidance/Article%20_11/POMEnvStds/gw_chemical; UKTAG, 'Groundwater Quantitative Classification for the purposes of the Water Framework Directive', (2008), http://www.wfduk.org/tag_guidance/Article%20_11/POMEnvStds/gw_quantitative; and UKTAG, 'Groundwater Trend Assessment', (2009), http://www.wfduk.org/tag_guidance/Article_05/Folder.2004-02-16.5332/gw_trend.

Figure 2.4 Significant impacts on surface water and groundwater bodies in Ireland for the second cycle. Percentages of numbers of water bodies²⁴



Source: WISE electronic reports

2.1.11 Groundwater bodies at risk of not meeting good status

In Ireland, 15% of groundwater bodies were reported to be at risk of failing to meet good qualitative status. Additionally, 37% of groundwater bodies have been classified as ‘under review’, which means that either measures are in place but water quality improvements have not yet been realised, or more commonly, that there is currently inadequate information to determine whether or not the water body is at risk.

Twenty substances are identified as causing risk to groundwater bodies, the majority of which are only identified as causing risk to a small number (1-5) of water bodies. However, phosphate and ammonium are the two substances that have been identified as causing risk

²⁴ Ireland subsequently informed the Commission that ‘Unknown impact type’ in the surface water graph is incorrect due to a reporting error (see footnote 14 above).

across a significant number of water bodies (15 and 33 respectively). In terms of water quantity, only one groundwater dependent terrestrial ecosystem has been identified as being at risk.

2.1.12 Quantification and apportionment of pressures

Twenty-four different pressure types were reported in Ireland, all of which are found in the three RBDs for surface water bodies, and 23 different pressure types were identified for groundwater bodies, all of which are found in the three RBDs. For surface water, six priority substances are identified as causing failure to good chemical status across all three RBDs, and for groundwater bodies the number of priority substances is seven. Significant pressures identified in the Programme of Measures for the second RBMP are related to agriculture, domestic wastewater systems, urban wastewater and urban runoff, forestry, extractive industry, invasive species, physical modification and abstractions/ diversions.

2.1.13 Quantification of gap to be filled for pressures causing failure of status objectives

For surface water, 18 individual chemical substances were reported to have measures planned. For groundwater, 21 individual chemical substances were reported to have measures planned. Additional pressures across all RBDs include point source pollution from urban wastewater, IED and non-IED plants; diffuse pollution from urban run-off, agriculture, forestry, and unconnected sewage discharges; abstraction or flow diversion – public water supply, physical alterations for flood protection and agriculture, unknown or obsolete dams, barriers and locks, introduced species and diseases, and other or anthropogenic pressures. In Ireland, there are a total of six priority substances that are causing failure of chemical status of surface water bodies, and seven substances for groundwater.

Indicator gaps have been reported across all three RBDs for isoproturon, lead, mercury, nickel, cadmium and hexachlorobutadiene; as well as point source pollution from urban wastewater, IED and non-IED plants; diffuse pollution from urban run-off, agriculture, forestry, and unconnected sewage discharges; abstraction or flow diversion – public water supply. Indicator gaps have also been reported for other pressures including physical alterations for flood protection and agriculture, unknown or obsolete dams, barriers and locks, as well as for introduced species and diseases, and other or anthropogenic pressures.

2.1.14 Inventories of emissions, discharges and losses of chemical substances

Article 5 of the Environmental Quality Standards Directive (EQS Directive²⁵) 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 for each RBD, or part thereof, lying within their territory. This inventory should allow Member States to further target measures to tackle pollution from priority substances. It should also inform the review of the monitoring networks and allow the assessment of progress made in reducing (or

²⁵ 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/legalcontent/EN/TXT/?uri=CELEX:02008L0105-20130913>

suppressing) emissions, discharges and losses for priority substances.

An inventory of emissions has been reported for all three RBDs, but not all substances were included in these inventories.

For each of the three RBDs, a total of 20 substances are included in an inventory (tetrachloroethylene, mercury, dichloromethane, hexachlorocyclohexane, atrazine, DEHP, trichloroethylene, hexachlorobenzene, DDT, isoproturon, dichloroethane, simazine, benzene, naphthalene, cadmium, nickel, hexachlorobutadiene, anthracene, lead and diuron).

The inventory has been developed in accordance with EU CIS Guidance Document n°28²⁶. Initially, an assessment of data available for monitored substances at the national level based on WFD water quality monitoring requirements was undertaken to identify relevant substances where any EQS was breached or was likely to be breached. The reference period chosen for the preparation of inventories of discharges to waters was 2010, as this was a transitional year for WFD organic monitoring suites. The development of the inventory of emissions is based on the model by Fuchs *et al.*, which identifies, for each of the key sources, the mechanisms and those emission factors available from research or from expert opinion that enable mass loadings to be evaluated on a national basis.²⁷ The model is based on a two-step approach. The first step ‘Assessment of Relevance’ considers point source data, based on information derived from the electronic Pollution Release and Transfer Register, results of PS/ PHS screening and WFD monitoring programmes and results from Wastewater Treatment Plant effluent characterisation studies. A list of relevant/ less relevant substances based on existing screening data and likelihood of presence is then produced. Step two involves a riverine load approach based on data on point sources, such as location, type and quantity of discharge, and the availability of emissions factors for PS/PHS. Results from the second step include the approximation of total lumped diffuse emissions, verification data for pathway and source-oriented approaches, and the listing of identified information gaps and measures required²⁸.

2.2 Main changes in implementation and compliance since the first cycle

Overall in Ireland, there has been a 24% decrease in the number of delineated surface water bodies compared to the first cycle, which can largely be attributed to a decrease in river waters bodies (30% decrease). Groundwater bodies have also decreased from the first cycle to the second cycle by 32%.

²⁶ CIS Guidance N° 28 - Preparation of Priority Substances Emissions Inventory

http://ec.europa.eu/environment/water/water-framework/facts_figures/guidance_docs_en.htm

²⁷ Fuchs, *et al.*, ‘The Emission Inventory Water: A Planning Support System for Reducing Pollution Emissions in the Surface Waters of Flanders’, in Stan Geertman and John Stillwell, eds., *Planning Support Systems Best Practice and New Methods* (Springer 2009).

²⁸ See Environmental Protection Agency, ‘An Inventory of Emissions to Waters in Ireland’, 2013, https://cdr.eionet.europa.eu/ie/eu/wfd2016/documents/national/envwtneaw/EPA_Inventory_of_Emissions_Report_Final_2014.pdf.

At the national level, there has been a slight increase (0.5%) in the delineation of heavily modified lakes; whereas rivers, transitional and coastal waters have all experienced a slight decrease (between 0.1 and 0.2 %).

There has been an overall decrease in the number of surface water types reported in the second cycle compared to the first cycle. River types have decreased from 82 in the first cycle to 38 in the second cycle; lakes have decreased from 61 to 38; transitional waters have decreased from 14 to six; and coastal waters have decreased from 23 to ten.

The first cycle identified 26 heavily modified water bodies, whereas 33 heavily modified water bodies were identified in the second cycle. In the first cycle five water bodies were identified as heavily modified in the North Western international RBD compared to six in the second cycle; and for the Neagh Bann international RBD, no water body was identified as heavily modified in the first cycle compared to one in the second cycle.

In the first cycle, diffuse pollution constituted 17% of the significant pressures on surface water bodies in Ireland, and in the second cycle this has increased to 25%. Diffuse pollution from agriculture remains the most significant pressure on all water bodies. Out of the 10 most significant pressures in the second cycle, diffuse pollution from agriculture on groundwater bodies affects 81% of all groundwater bodies, and 17% of all surface water bodies. In relation to point source pollution, there has been a slight overall decrease from point source affecting 11% of surface water bodies in the first cycle to 8% in the second cycle. The most significant pressures from point source pollution were identified as urban wastewater, which affects 6% of all surface water bodies, and in the case of groundwater, both waste disposal and non-LED plants, which both affect 22% of all groundwater bodies.²⁹

Direct comparison of water bodies at the RBD level is problematic given changes to the number and delineation of RBDs and water bodies.

2.3 Progress with the Commission recommendations

The Commission recommendations based on the first RBMPs and PoM requested action on the following:

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

Assessment: The characterisation of RBDs has changed significantly from the first cycle to the second cycle. Most significantly, the Eastern, South Eastern, South Western, Western and

²⁹ Ireland subsequently clarified that the significant pressure percentages for groundwater are incorrect and appear to be based on the subset of the 126 (of the 513) groundwater bodies with significant pressures identified, rather than the full set of groundwater bodies reported on. For agriculture, there were significant pressures identified for 60 groundwater bodies (11% of the overall number of groundwater bodies). For waste disposal and Industrial Emissions sites (IED), there were 33 groundwater bodies (6% of the overall number of groundwater bodies) with significant pressures.

Shannon RBDs have mostly been merged into one ‘national’ RBD. This single administrative area for the Ireland is designed to enhance co-ordination in the implementation of the WFD. There has also been a change in the number of international RBDs, from three (Neagh Bann, North Eastern and North Western) in the first cycle to two in the second cycle (Neagh Bann and North Western). Parts of the Shannon River RBD, have been subsumed into the North Western international RBD, and the Republic of Ireland RBD. However, the designation of transboundary water bodies remains unclear, with Ireland reporting three water bodies of the ‘national’ Republic of Ireland RBD as transboundary (one river and three groundwater bodies). Changes in the water body designation means that the second cycle river water body network now has a stronger relationship to WFD status classification. In relation to groundwater bodies, a full assessment of pressures led to changes in the delineation of groundwater bodies for the second cycle, so that not only the physical characteristics but also their likely WFD status was taken into account when delineating groundwater bodies. This recommendation has been partially fulfilled.

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

3.1 Assessment of implementation and compliance with the WFD requirements in 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.

Monitoring programmes are reported for all three RBDs and include all the expected categories and purposes. There is one single monitoring programme for both surface waters and groundwaters.

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

Table 3.1 compares the number of monitoring sites used for surveillance and operational purposes between the first and second RBMPs, and Table 3.2 gives the number of sites used for different purposes for the second RBMPs. Figure 3.1 shows the proportion of water bodies subject to surveillance and operational monitoring.

Following a technical review of the national WFD monitoring programme, which in Ireland falls under the overall responsibility of the Environmental Protection Agency, there has been a change in reporting monitoring sites. In the first cycle, Ireland only reported water bodies as a single site (typically the centroid location of a water body) whereas in the second cycle individual monitoring sites within water bodies were reported.

Table 3.1 Number of sites used for surveillance and operational monitoring in Ireland for the second and first RBMPs. Note that for reasons of comparability with data reported in the first RBMPs, data for the second RBMPs does not take into account whether sites are used for ecological and/or chemical monitoring³⁰

	Rivers		Lakes		Transitional		Coastal	
	Surv.	Op	Surv.	Op	Surv.	Op	Surv.	Op
Second RBMPs								
IEGBNIIENB	10	172	26	70	0	22	0	8
IEGBNIIENW	0	0	0	0	0	0	0	0
IEROI	155	2744	717	788	120	313	82	169

³⁰ Ireland subsequently informed the Commission that because of differences in reporting (as noted above) it is not possible to compare changes in monitoring between the two cycles and so table 3.1 and table 3.2 are not comparing the same thing.

	Rivers		Lakes		Transitional		Coastal	
	Surv.	Op	Surv.	Op	Surv.	Op	Surv.	Op
Total	165	2916	743	858	120	335	82	177
<i>Total number of monitoring site used for surveillance and/or operational monitoring</i>	3081		1601		455		259	
First RBMPs								
IEGBNISH	46	603	17	48	5	7	0	2
IEEA	15	243	6	16	3	6	1	4
GBNIIENW	20	265	18	52	2	4	2	4
GBNIIENB	4	59	1	5	0	2	0	1
IESE	33	519	0	5	6	25	1	4
IESW	31	388	6	22	3	19	3	6
IEWE	31	422	25	62	6	12	3	5
Total	180	2499	73	210	25	75	10	26
<i>Total number of monitoring site used for surveillance and/or operational monitoring</i>	2679		283		100		36	

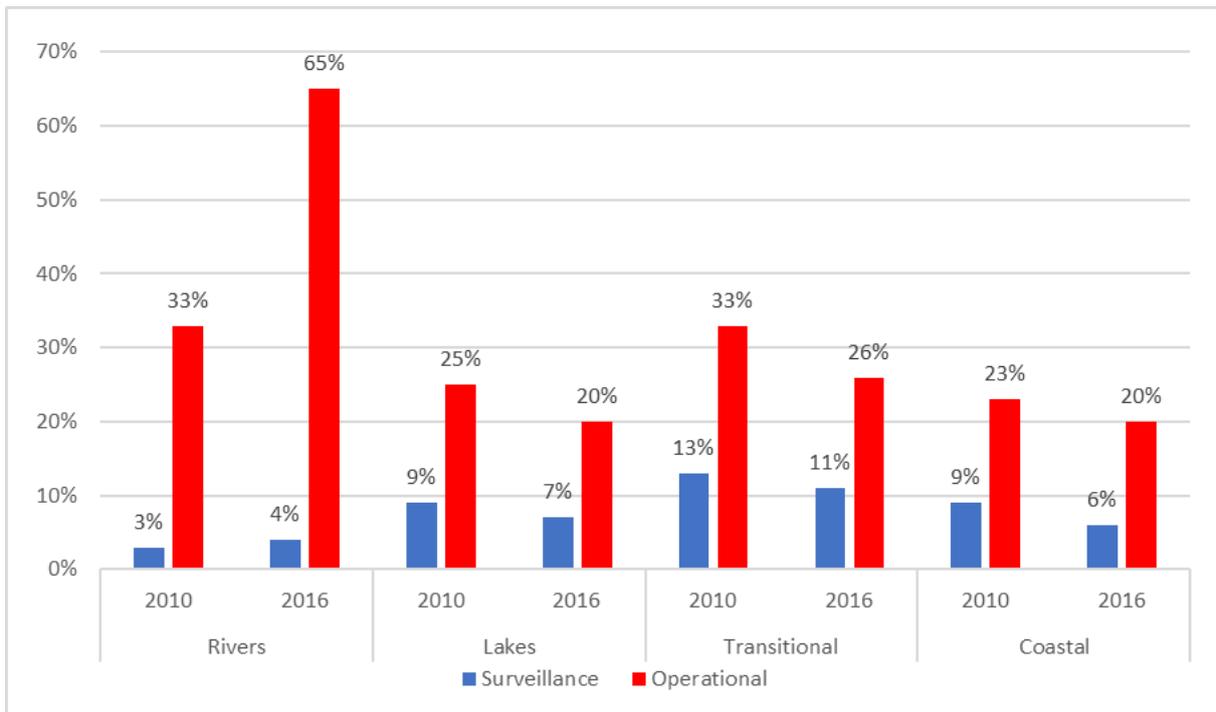
Source: WISE Electronic reports

Table 3.2 Number of monitoring sites in relevant water categories used for different purposes for the second RBMP in Ireland.

Monitoring Purpose	Lakes	Rivers	Transitional	Coastal
BWD - Recreational or bathing water - WFD Annex IV.1.iii	6	0	0	0
CHE - Chemical status	56	174	29	9
DRI - Groundwater abstraction site for human consumption	81	9	0	0
DWD - Drinking water - WFD Annex IV.1.i	82	10	0	0
ECO - Ecological status	1330	2796	381	270
HAB - Protection of habitats or species depending on water - WFD Annex IV.1.v	0	62	0	0
INV - Investigative monitoring	7	0	0	0
MSF - Marine Strategy Framework Directive monitoring network	0	0	0	270
OPE - Operational monitoring	823	2830	324	173
REF - Reference network monitoring site	23	0	4	4
RIV - International network of a river convention (including bilateral agreements)	0	20	0	0
SOE - EIONET State of Environment monitoring	675	159	98	75
SUR - Surveillance monitoring	730	160	120	82
UWW - Nutrient sensitive area under the Urban Waste Water Treatment Directive - WFD Annex IV.1.iv	0	11	0	0

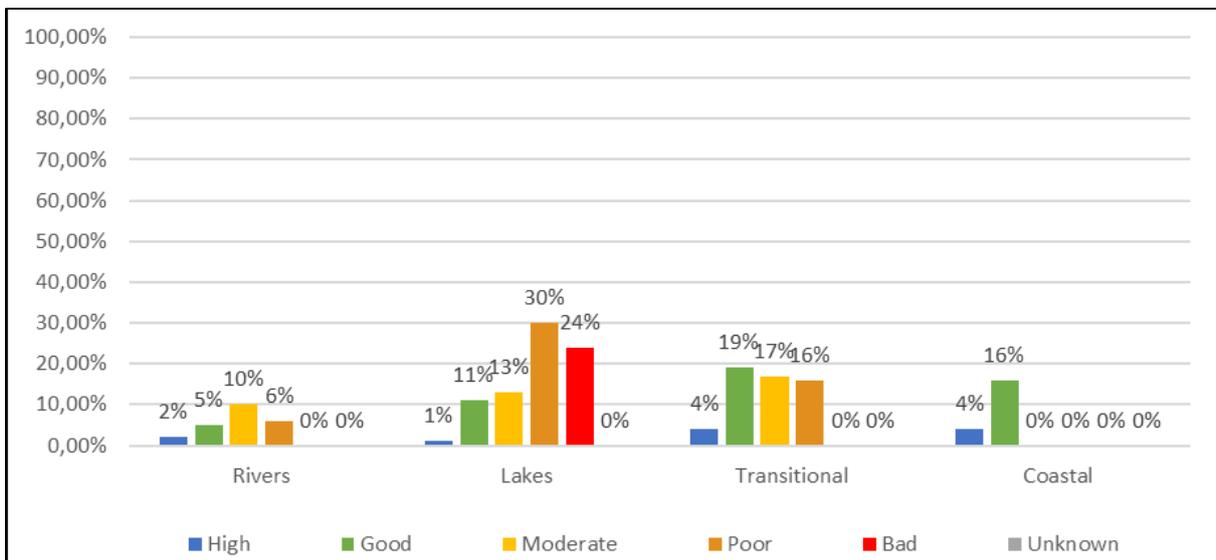
Source: WISE Electronic reports

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



Source: WISE electronic reports

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



Source: WISE electronic reports

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

https://tableau.discomap.eea.europa.eu/t/Wateronline/views/WISE_SOW_QualityElement_Status_Compare/SWB_QualityElement_Group?iframeSizedToWindow=true&:embed=y&:display_count=no&:showAppBanner=false&:showVizHome=no

International surface water body monitoring

The Republic of Ireland reported that 20 sites relating to river bodies were part of an international network. Both international RBDs (Neagh Bann and North Western) are reported as having monitoring programmes in place.

Quality elements monitored (excluding River Basin Specific Pollutants)

Table 3.3 provides an overview of the quality elements monitored for the second cycle in Ireland (excluding River Basin Specific Pollutants). Biological quality elements that are used in the classification of surface water bodies in Ireland have not changed between the first and second cycle for rivers. Other water bodies categories have seen the introduction of additional biological quality elements, including ‘other aquatic flora’ (lakes, coastal and transitional waters), phytobenthos (lakes), angiosperms, (transitional waters) benthic invertebrates (coastal and transitional waters)³¹

Table 3.3 Quality elements monitored for the second RBMPs in Ireland (excluding River Basin Specific Pollutants). Note; quality element may be used for surveillance and/or operational monitoring³²

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

³¹ Ireland subsequently clarified that greater number of biological elements are monitored than indicated in the Table 3.3

³² Ireland subsequently clarified that acidification status is monitored in rivers and lakes; nitrogen conditions are monitored across all surface water categories but only assessed for river and coastal waters; phosphorus conditions are monitored across all surface water categories but only assessed for rivers, lakes and transitional waters.

	Transparency conditions	Thermal conditions	Oxygenation conditions	Acidification status	Nitrogen conditions	Phosphorus conditions	Silicate	Other determinant for nutrient conditions
Rivers		No	Yes	Yes	Yes	Yes	Yes	
Lakes	No	No	Yes	No	Yes	Yes	Yes	
Transitional	No	No	Yes	No	No	Yes		
Coastal	No	No	Yes	No	No	No		Yes

Source: WISE Electronic reports

Annex V of the Water Framework provides guidance on the frequency of monitoring of the different quality elements. Surveillance monitoring should be carried out for each monitoring site for a period of one year during the 6-year period covered by a RBMP. For phytoplankton, this should be done twice during the monitoring year and for the other biological quality elements once during the year. Operational monitoring should take place at intervals not exceeding once every six months for phytoplankton and once every three years during the 6-year cycle for the other biological quality elements. Greater intervals may be justified on the basis of technical knowledge and expert judgement.

Phytoplankton were monitored at least at the minimum recommended frequency for lakes but not for rivers, transitional and coastal waters. Fish are monitored in rivers only. Angiosperms and other aquatic flora are not monitored to the required frequency in any of the water body types in Ireland. In relation to general physiochemical quality elements, the only element that is monitored to the requisite frequency across all water bodies is oxygenation conditions. Nitrogen conditions are monitored across river and lakes as is silicate. Phosphorous conditions is monitored to the requisite frequency across all water bodies except coastal waters. No hydromorphological quality elements are monitored.³³

River Basin Specific Pollutants and matrices monitored

Table 3.4 shows the number of sites used to monitor River Basin Specific Pollutants in Ireland. The total number of sites used is 269. Fifteen pollutants are monitored in all three RBDs for rivers and lakes, and 13 for coastal and transitional waters. These pollutants are all monitored in water.

³³ Ireland subsequently clarified that 1) phytoplankton are monitored in transitional and coastal waters at the recommended frequency 2) fish are also monitored in lakes and transitional waters and not just rivers 3) angiosperms are monitored in transitional and coastal waters (seagrass) and other aquatic flora (saltmarsh) are monitored in transitional waters at the recommended frequency. 4) nitrogen and phosphorus are monitored across all surface water categories 5) hydromorphological quality elements are monitored in each surface water category although not reported due to a reporting error by Ireland.

Table 3.4 Number of sites used to monitor River Basin Specific Pollutants reported in the second RBMPs and non-priority specific pollutants and/or other national pollutants reported in the first RBMPs in Ireland. Note the data from both cycles 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 RBMPs.

RBMPs		Lakes	Rivers	Transitional	Coastal
first	Sites used to monitor non-priority specific pollutants and/or other national pollutants				
second	Sites used to monitor River Basin Specific Pollutants	9	57	180	30

Source: WISE Electronic reports

Annex V of the WFD provides guidance on the frequency of monitoring of the different quality elements: once every three months is recommended for “other pollutants” which are taken here to equate to river basin specific pollutants. Surveillance monitoring should be carried out for each monitoring site for a period of one year during the period covered by a river basin management plan i.e. six years. For river basin specific pollutants this should be done four times for the surveillance year; and for operational monitoring four times a year for each year of the cycle.

River basin specific pollutants discharged in significant quantities in the river basin or sub-basin are monitored at each surveillance monitoring site for at least three month intervals in accordance with Annex V of the WFD.³⁴ In the operational programme, the quality elements indicative of the pressure(s) to which the water body or bodies are subject are monitored, including all priority substances and other pollutants discharge in significant quantities in the river basin or sub-basin.³⁵

Use of monitoring results for classification

Only monitoring results were used in Ireland for classification. For river water bodies the quality elements used for classification include benthic invertebrates, fish, oxygenation conditions, acidification status, nitrogen conditions, phosphorus conditions and river basin specific pollutants. In lake water bodies the following quality elements are used for classification: phytoplankton, other aquatic flora, macrophytes, phytobenthos, fish, thermal conditions, oxygenation conditions, acidification status, nitrogen conditions phosphorus conditions and river basin specific pollutants. In coastal and transitional water bodies the following quality elements are used for classification, phytoplankton, fish, benthic

³⁴ Environmental Protection Agency, ‘Ireland – Overview of the Water Framework Directive Monitoring Programme (2013-2018), p. 8.

https://cdr.eionet.europa.eu/ie/eu/wfd2016/documents/national/envwtneaw/Edited_WFD_NationalMonitoringProgramme_2013-2018_PW_05042018.pdf

³⁵ Environmental Protection Agency, ‘Ireland – Overview of the Water Framework Directive Monitoring Programme (2013-2018),

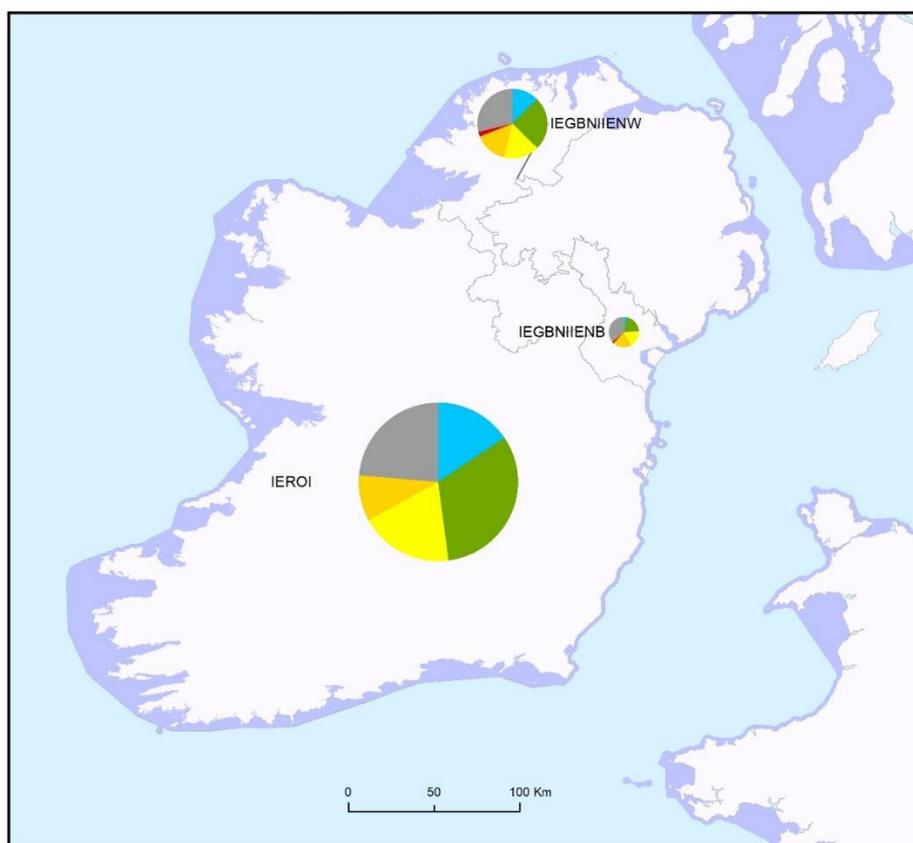
https://cdr.eionet.europa.eu/ie/eu/wfd2016/documents/national/envwtneaw/Edited_WFD_NationalMonitoringProgramme_2013-2018_PW_05042018.pdf

invertebrates, oxygenation conditions, phosphorus conditions, phytoplankton, other aquatic flora, macroalgae and angiosperms, and river basin specific pollutants.

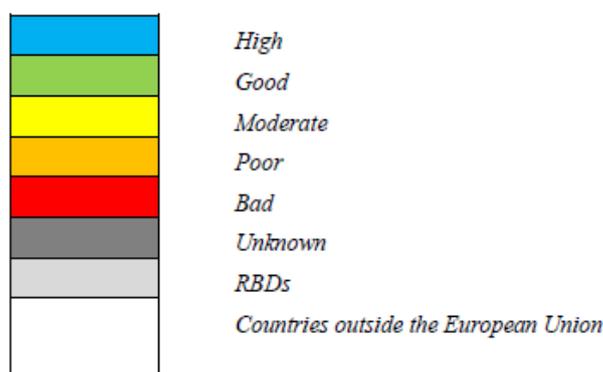
3.1.2 Ecological Status/potential of surface water

Overall water status and ecological status

Map 3.1 Ecological status or potential surface water bodies in Ireland



*Note: Standard colours based on WFD Annex V, Article 1(4)(2)(i)
Source: WISE, Eurostat (country borders)*



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

https://tableau.discomap.eea.europa.eu/t/Wateronline/views/WISE_SOW_QualityElement_Status_Compare/SWB_QualityElement_Group?iframeSizedToWindow=true&:embed=y&:display_count=no&:showAppBanner=false&:showVizHome=no

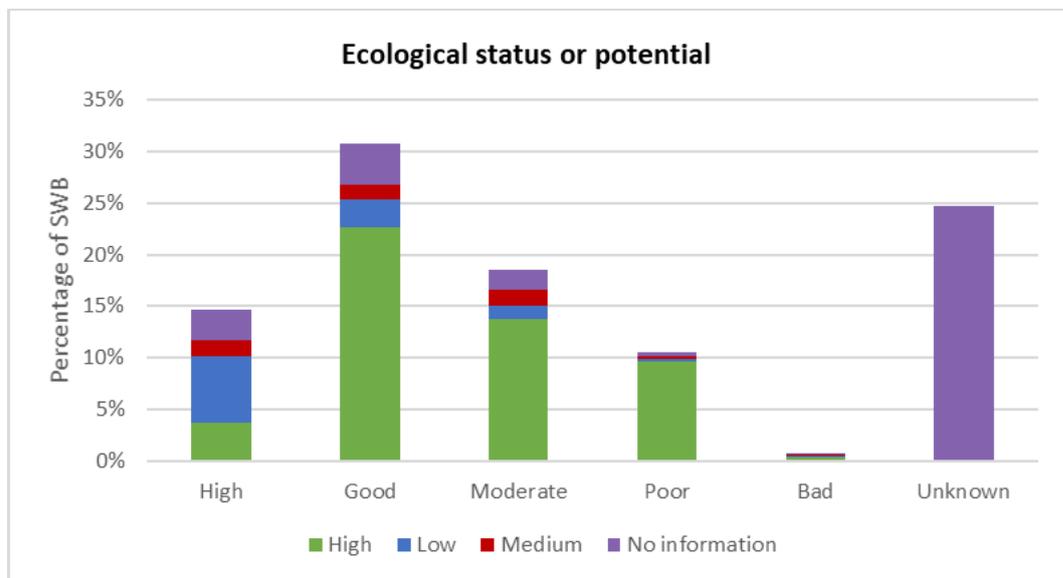
The ecological status/ potential of surface water bodies in Ireland in the second RBMP is illustrated in Map 3.1. 15% of surface water bodies were classified as of high-water status in the second cycle, and 31% were classified as of good status. This compares to 54% of surface waters achieving ‘good or better’ status in the first cycle. There has therefore been a decrease of 8% in the number of surface water bodies achieving good or high water status.

Confidence in ecological status assessment

While the one-out, all-out classification is used across all surface waters, the rivers, lakes, transitional and coastal waters use different suites of physio-chemical, biological and hydromorphological assessment tools. Each category combines these elements in different ways to assign final ecological status. The same general principles for assigning overall confidence in class apply across all categories, namely i) confidence in class is based on the element driving status; and ii) if more than one element is driving status, the lowest confidence is applied to the final status. There are four categories for reporting confidence: (0) No information; (1) low confidence; (2) medium confidence; and (3) high confidence.

There is a high or good level of confidence in the classification of ecological status in 28% of surface water bodies, and for 14% of surface water bodies there is moderate confidence. The confidence rate for 25% of surface water bodies is unknown.

Figure 3.3 Confidence in the classification of ecological status or potential of surface water bodies in Ireland



Sources:

WISE electronic reports

Ecological status change

There has been an overall decrease in the number of water bodies in less than good status in Ireland. During the first cycle, 42% of all surface water bodies were categorised as below good water status; whereas during the second cycle, only 30% were categorised below good water status – although 25% were classified as ‘unknown’.

Elevated nutrient concentrations (phosphorus and nitrogen) are the most prevalent water quality problem in Ireland RBDs. Phosphorus loads are the main driver of ecological impact in rivers and lakes. Following decades of declining phosphorus concentrations, steady increases have been observed since 2014. Siltation can also be a problem in some rivers. In transitional and coastal waters nitrogen is a key factor in ecological status, although nutrient inputs into the marine environment have decreased substantially since 1990. However, this rate of reduction has slowed in recent years, and in some cases has increased. Due to the ‘blue

dots' programme, led by the Environmental Protection Agency, bad status is being addressed in Ireland's most seriously polluted waters³⁶.

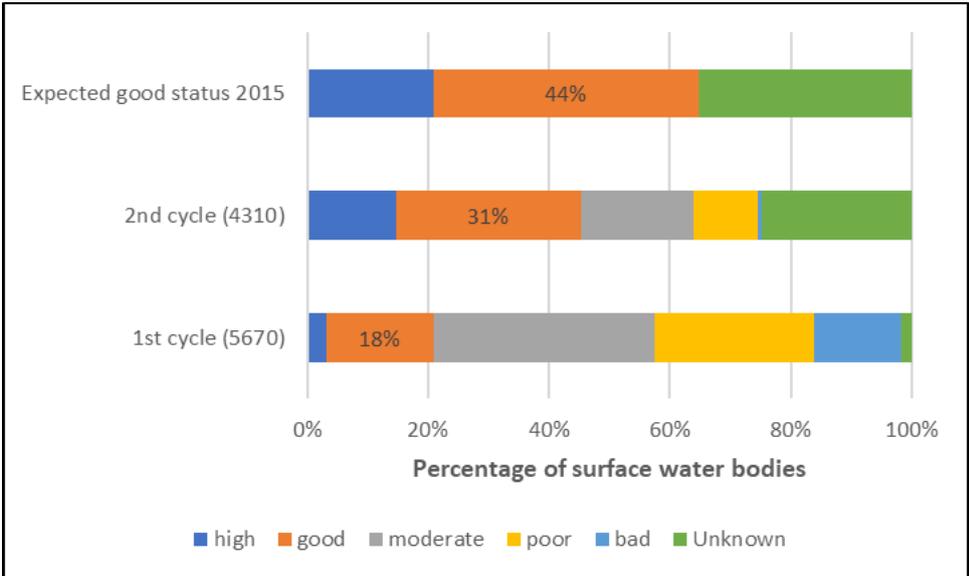


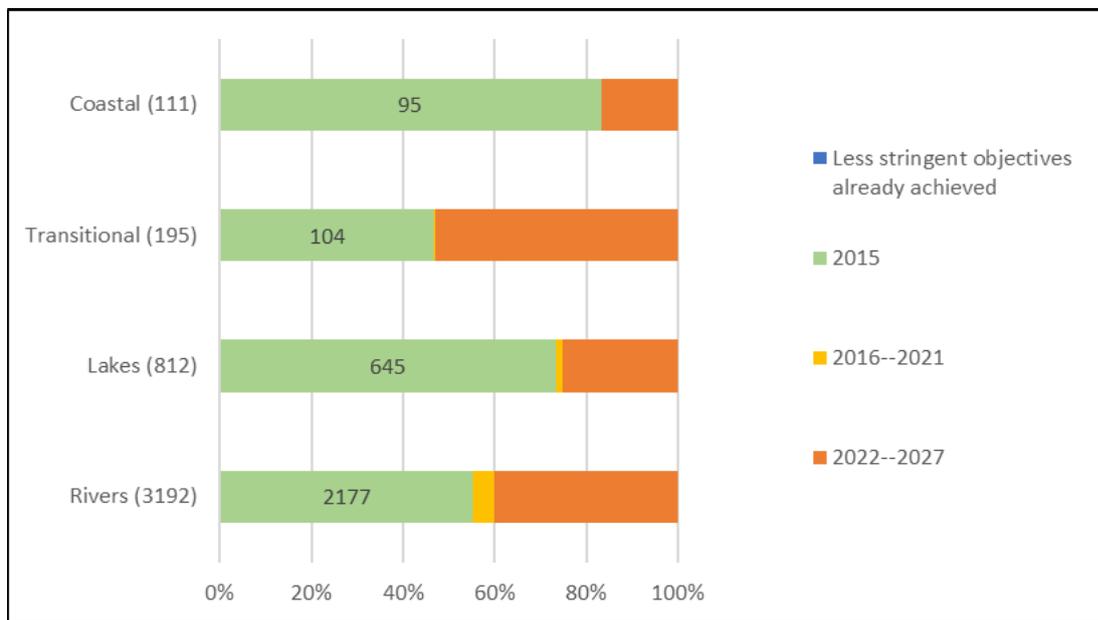
Figure 3.4

Ecological status or potential of surface water bodies in Ireland 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 that the period of the assessment of status for the second RBMPs was 2009 to 2015. The year of the assessment of status for the first RBMPs is not known

Source: WISE electronic reports

³⁶ <https://www.catchments.ie/the-blue-dot-catchments-programme/>.

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



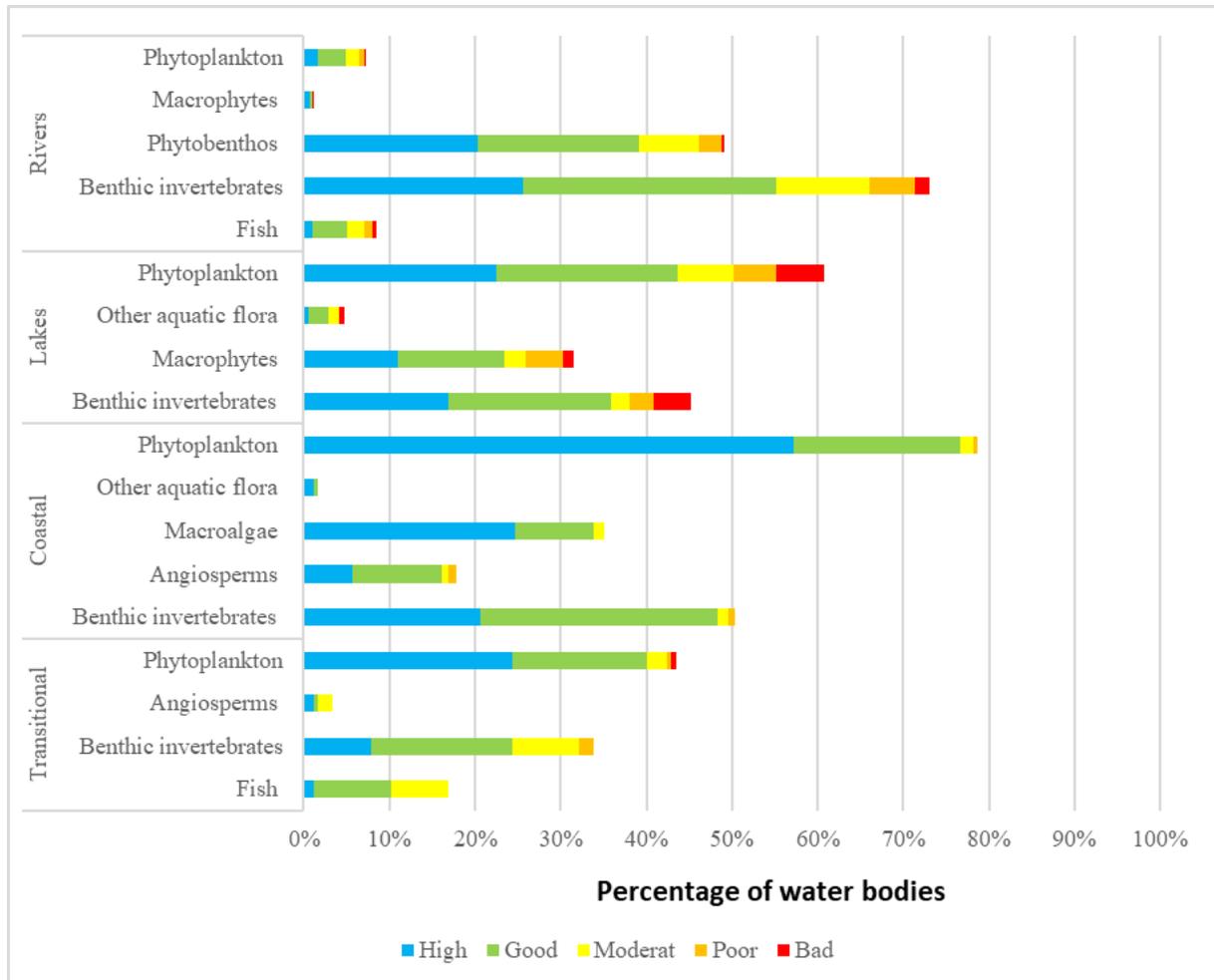
Source:

WISE electronic reports

Classification of ecological status in terms of each classified quality element

Figure 3.6 shows the biological quality elements used in the classification of surface water bodies in Ireland. Phytoplankton, Benthic invertebrates and Fish are used to classify ecological status across all water body types. Macrophytes are only used for rivers and lakes, Phytobenthos are only used for river water bodies, and angiosperms are used for both transitional and coastal waters. Biological quality elements that are used in the classification of river water bodies in Ireland have not changed between the first and second cycle for rivers. Other water bodies, i.e. lakes, coastal and transitional waters, have seen the introduction of additional biological quality elements, including ‘other aquatic flora’ (lakes, coastal and transitional waters), phytobenthos (lakes), angiosperms, (transitional waters) benthic invertebrates (coastal and transitional waters). Only monitoring was used in the classification.

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

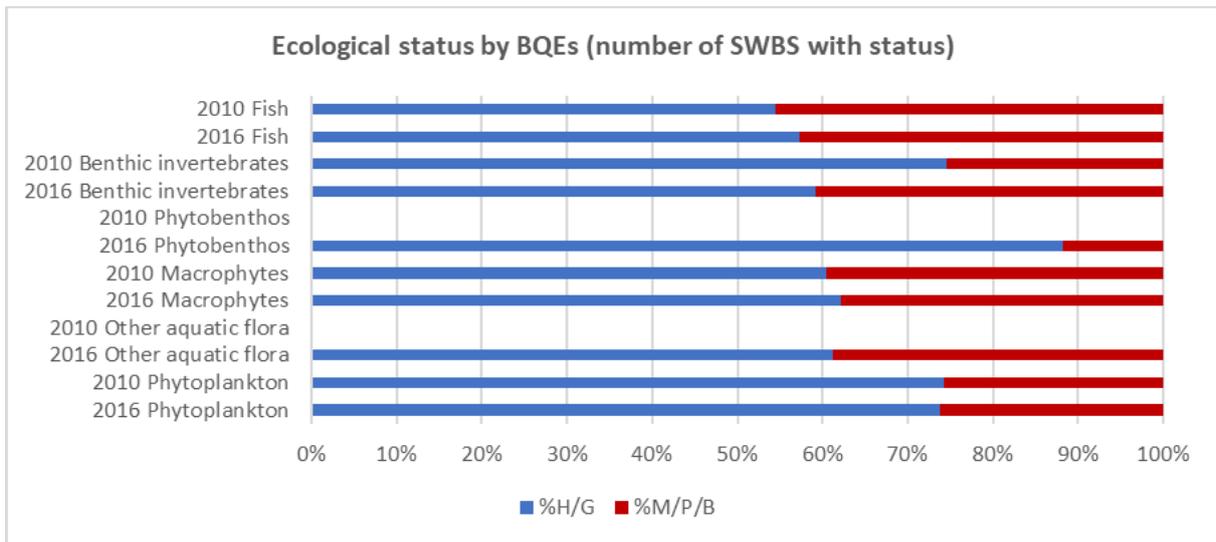


Source: WISE electronic reports

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

https://tableau.discomap.eea.europa.eu/t/Wateronline/views/WISE_SOW_QualityElement_Status_Compare/SWB_QualityElement_Group?iframeSizedToWindow=true&:embed=y&:display_count=no&:showAppBanner=false&:showVizHome=no

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



Source: WISE electronic report

The comparison of the ecological status/ potential of the biological quality elements used in the classification of surface water bodies in Ireland, as shown in Figure 3.7, should be treated with caution as there are differences between the numbers of surface water bodies classified for individual elements and differences in methodologies from the first to the second RBMPs’.

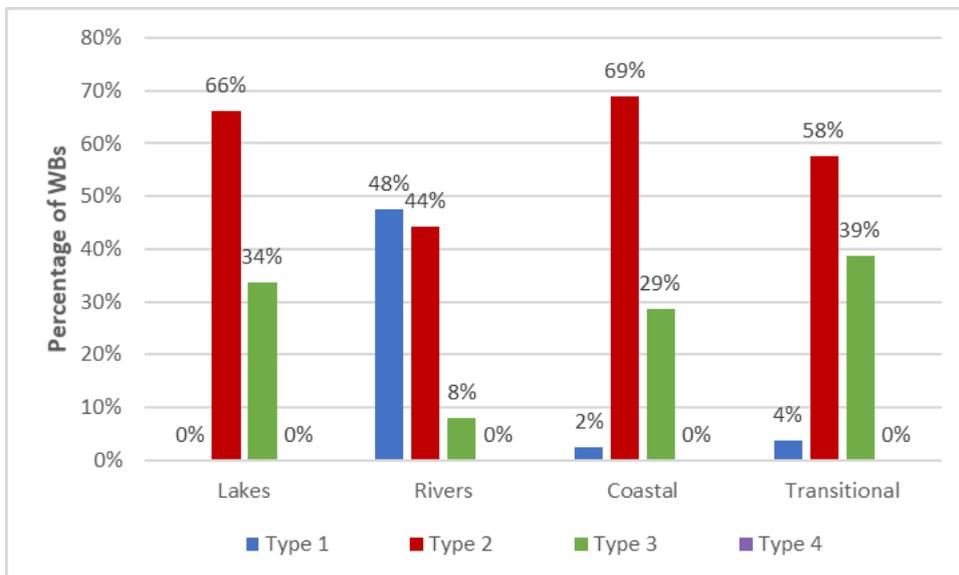
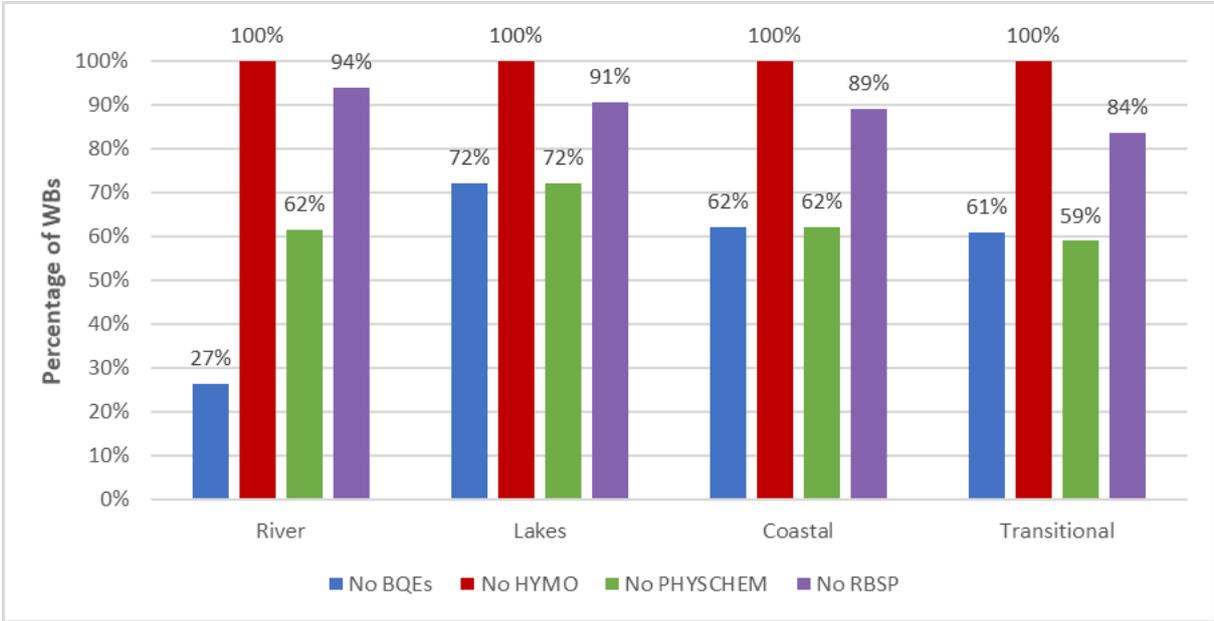


Figure 3.8 The classification of the ecological status or potential of surface waters in Ireland using 1, 2, 3 or 4 types of quality element.

Source: WISE electronic report

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



Source: WISE electronic report

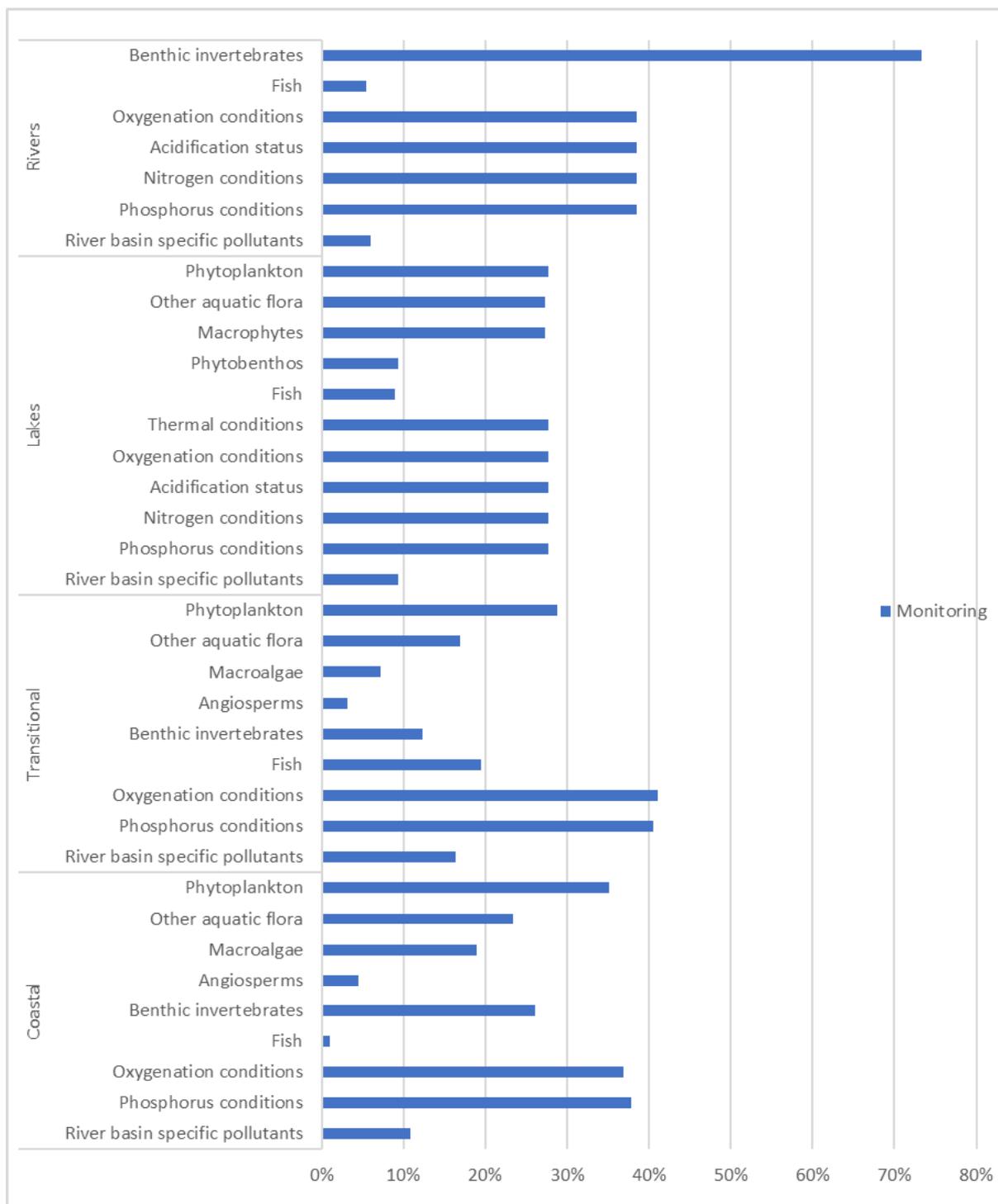


Figure 3.10 Basis of the classification of ecological status/potential in Ireland. The percentages are in terms of all waterbodies in each category.

Source: WISE electronic report

Assessment methods and classification of biological quality elements

The same assessment methods and classification of biological quality elements are in place for all three RBDs in Ireland. For river bodies, assessment methods (q-value and fish classification scheme 2) are in place to assess benthic invertebrates and fish in river bodies. For lake bodies, three assessment methods are adopted (lake phytoplankton index for

phytoplankton; free macrophyte index for macrophytes; and fish in lakes classification tool 2 for fish). There are six assessment methods in place for transitional waters (phytoplankton composition and abundance for phytoplankton; opportunistic macroalgae multimetric system for macroalgae; intertidal seagrass abundance and species composition for angiosperms; infaunal quality index for benthic invertebrates; and both transitional fish classification index and estuarine fish multi-metric index for fish). For coastal waters, there are five assessment methods (phytoplankton composition and abundance for phytoplankton; opportunistic macroalgae and rocky shore reduced species list multimetric systems for macroalgae; intertidal seagrass abundance and species composition for angiosperms; and infaunal quality index for benthic invertebrates). Biological quality elements were not fully developed in the first river basin planning cycle, with biological quality elements missing for rivers (macrophytes, phytobenthos, fish), lakes (phytobenthos, benthic invertebrates, fish), transitional (phytoplankton, angiosperms, benthic invertebrates, fauna and fish), and coastal waters (benthic invertebrates).

Intercalibration of biological quality element methods

In Ireland, 66% of surface water body types are linked to common intercalibration types. Methods for the assessment of biological quality elements have been developed since the commencement of Ireland's monitoring programme for the WFD, which commenced in 2006. In rivers and lakes, nearly all methods currently used have been intercalibrated. Several biological quality elements in transitional and coastal waters, such as benthic invertebrates in transitional waters, have yet to be fully intercalibrated³⁷.

Assessment of hydromorphological quality elements

Hydromorphological conditions were reported not to be monitored nor assessed in any of the categories of water bodies.³⁸

Classification methods for physicochemical quality elements

Standards have been reported for 16 general physicochemical quality elements in rivers, lakes, coastal and transitional waters in Ireland. Temperature, acidification and ammonium are assessed in rivers and lakes in all three RBDs. Nitrate is assessed in river water bodies only in all three RBDs. Total phosphorous is assessed for lakes and dissolved inorganic nitrogen is assessed for coastal waters. 56% of standards are consistent with the good-moderate status boundary of the relevant sensitive biological quality elements.

³⁷ See, Environmental Protection Agency (Ireland), *Overview of the Water Framework Directive Monitoring Programme (2013=2018)*,

https://cdr.eionet.europa.eu/ie/eu/wfd2016/documents/national/envwtneaw/Edited_WFD_NationalMonitoringProgramme_2013-2018_PW_05042018.pdf. Ireland subsequently informed the Commission that all biological quality elements in transitional and coastal waters, including phytoplankton, benthic invertebrates, macroalgae, angiosperms and fish (transitional waters only) are now intercalibrated and have been included in the last Commission Decision on intercalibration (Commission Decision (EU) 2018/229

³⁸ Ireland subsequently informed the Commission that this was due to a reporting error. Ireland currently monitors hydromorphological quality elements in rivers using the River Hydromorphological Assessment Technique, in lakes using Lake MiMAS and in transitional and coastal waters using the Hydromorphological Quality Index.

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

In January 2018, the Environmental Protection Agency established a National Aquatic Environmental Chemistry Group (NAECG), to develop and maintain national expertise on hazardous chemicals in the aquatic environment. Chaired by the Environmental Protection Agency, the group is comprised of experts in the monitoring, assessment and management of hazardous chemicals from national agencies, including the Department for Housing, Planning and Local Government, the Marine Institute, Irish Water, the Health and Safety Authority, the Department of Agriculture, Food and the Marine, the Geological Survey of Ireland, local authorities and the DCCAE. Amongst other responsibilities, the NAECG recommends approaches to the setting of environmental quality standards for specific pollutants in Ireland.

Environmental quality standards were reported for 15 different River Basin Specific Pollutants in Ireland. 13 out of the 15 environmental quality standards are reported for all water body categories, while chromium 3+ is only reported for rivers and lakes. Environmental quality standards have only been established for water, not for sediment or biota.

The majority of these substances were reported for all water body types, with two substances (glyphosate and chromium 3+) reported only for rivers and lakes. For all three RBDs, the analytical methods used meet the minimum performance criteria laid down in Article 4.1 of the Quality Assurance/Quality control Directive (2009/90/EC)³⁹, except for the case of diazinon.

In Ireland, River Basin Specific Pollutants were used in the classification of ecological status/potential across all water category types. Of these River Basin Specific Pollutants, zinc, copper and chromium 3+ are reported as causing failure of good ecological status/potential.

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

The one-out, all out principle has been used for all three RBDs in the Republic of Ireland.

3.2 Main changes in implementation and compliance since first the RBMPs

Following a technical review of the national WFD monitoring programme, which in Ireland falls under the overall responsibility of the Environmental Protection Agency, there has been a change in reporting monitoring sites. In the first cycle, Ireland only reported water bodies as a single site (typically the centroid location of a water body) whereas in the second cycle individual monitoring sites within water bodies were reported.

Biological quality elements that are used in the classification of surface water bodies in Ireland have not changed between the first and second cycle for rivers. Other water bodies have seen the introduction of additional biological quality elements, including 'other aquatic flora' (lakes, coastal and transitional waters), phytobenthos (lakes), angiosperms, (transitional waters) benthic invertebrates (coastal and transitional waters). For physiochemical elements,

³⁹ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:201:0036:0038:EN:PDF>

oxygenation, nitrogen and phosphorous conditions are the main elements monitored across water bodies. No hydromorphological elements are monitored. No data on River Basin Specific Pollutants was provided for the first cycle. For the second cycle the number of sites used to monitor River Basin Specific Pollutants in Ireland is 269. Fifteen pollutants are monitored in all three RBDs for rivers and lakes, and 13 for coastal and transitional waters. These pollutants are all monitored in water.

Information on the assessment of confidence was limited during the first cycle. For rivers confidence was incorporated into the status assessment. For lakes, the assessment of confidence depended on the driving elements, and was largely done through expert judgement. For transitional and coastal waters no information was supplied on the methods used to assess confidence, except to say that confidence was generally not high enough to classify below moderate. In the second cycle confidence has been classified for all surface water bodies, with high or good levels in 28% of bodies, moderate confidence for 14% and 25% are unknown.

In terms of rivers, operational monitoring covers 65% of all river bodies (a 32% increase), and surveillance monitoring covers 4% of river bodies (a 1% increase from the first cycle). The number of lakes covered by surveillance monitoring has dropped slightly (from 9% to 7% coverage); and similarly, for operational monitoring there has been a 5% reduction in lake bodies covered (25% to 20%). There has also been a reduction in number of transitional waters covered by surveillance monitoring (13% to 11%) and operational monitoring (33% to 26%). Finally, coastal water has also experienced a reduction in the number of water bodies covered by monitoring sites – surveillance site coverage has decreased from 9% to 6%, and operational site coverage from 23% to 20%.

The ecological status/ potential of surface water bodies in Ireland in the second RBMP is illustrated in Map 3.1. 15% of surface water bodies were classified as of high-water status in the second cycle, and 31% were classified as of good status. This compares to 54% of surface waters achieving ‘good or better’ status in the first cycle. There has therefore been a decrease of 8% in the number of surface water bodies achieving good or high water status. However, there has also been an increase in the number of water bodies with unknown water status (from 2% in the first cycle to 25% in the second cycle). It should also be kept in mind that changes in both the monitoring methods and delineation of water bodies between the first and second cycles call for caution when seeking to compare across cycles.

3.3 Progress with Commission recommendations

The Commission recommendations based on the first RBMPs and PoM requested action on the following:

- Recommendation: *Ireland should provide more transparent and complete reports on issues such as monitoring networks and ecological status assessment, both in the RBMPs and to WISE.*

Assessment methods for classification of ecological status were not fully developed for all biological and physico-chemical quality elements in all water categories for the first RBMP and only interim status has been reported. Although it is recognised that much development has taken place since the submission of the RBMPs, also following

the intercalibration process at the EU level, Ireland is recommended to ensure this process is completed for the second cycle.

The monitoring programmes need to be fully developed, since not all the required quality elements are included in the monitoring programmed for lakes and coastal waters. Coastal and estuarine monitoring programmes have not yet been fully implemented.

The identification of river basin specific pollutants needs to be more transparent, with clear information on how pollutants were selected, how and where they were monitored, where there are exceedances and how such exceedances have been taken into account in the assessment of ecological status. It is important that there is an ambitious approach to combatting chemical pollution and that adequate measures are put in place.

Assessment: Ireland's review of its monitoring programme has led to significant changes between the first and second cycles, and a development of that programme, in particular, in relation to the number of monitoring sites and the assessment of biological and physico-chemical quality elements. This has led to more detailed reports on monitoring networks and ecological status assessment in WISE, however, some data, such as groundwater monitoring data, is missing. In addition, only certain physiochemical elements, oxygenation, nitrogen and phosphorous conditions are monitored, and only for certain water bodies. No hydromorphological elements are monitored. Data on River Basin Specific Pollutants is now included, which marks an improvement from the first cycle.

In terms of classification, while some water bodies, ie., lakes, costal and transitional waters have seen the introduction of additional biological quality elements, including 'other aquatic flora' (lakes, coastal and transitional waters), phytobenthos (lakes), angiosperms, (transitional waters) benthic invertebrates (coastal and transitional waters); the biological quality elements that are used in the classification of river water bodies in Ireland have not changed between the first and second cycle for rivers.

Details of the monitoring programme, including information on the monitoring of river basin specific pollutants, is provided for in the Environmental Protection Agency's, 'Overview of the WFD Monitoring Programme (2013-2018).

This recommendation has been partially fulfilled.

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

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

4.1.1 Monitoring of chemical status in surface waters

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

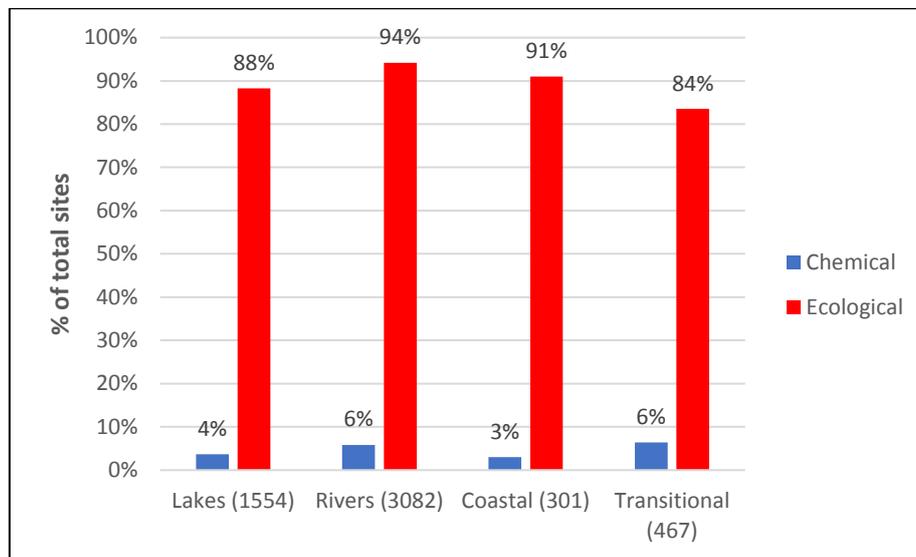
Member States have to implement surveillance and operational monitoring programmes in accordance with the requirements of the WFD and of the EQS Directive, for the assessment of ecological status/potential and chemical status.

Surveillance monitoring programmes should allow Member States to supplement and validate the impact assessment procedure, 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 PoM.

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

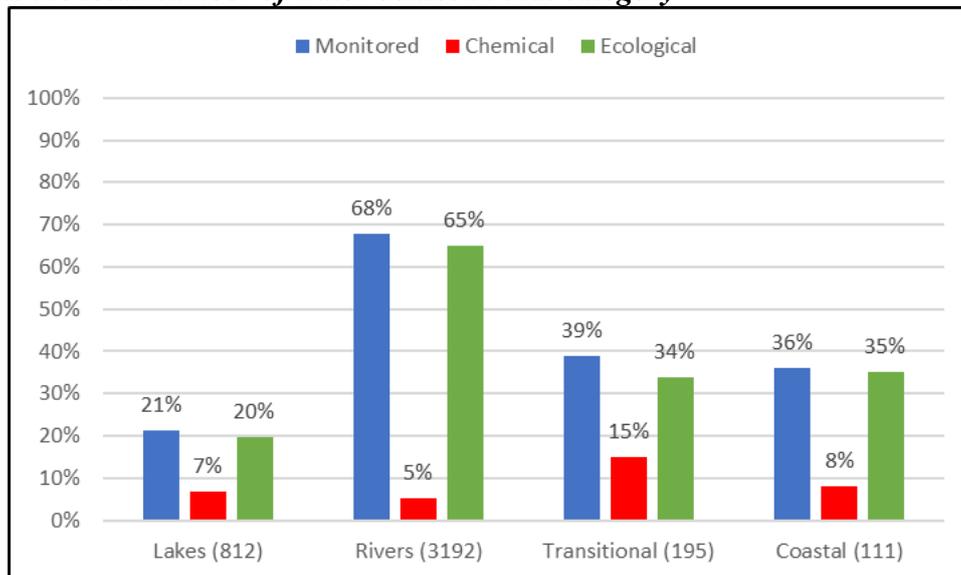
More specifically, figure 4.1 summarises the proportion of sites used for monitoring of chemical status in surface waters for the second RBMP. This figure shows that only a small percentage of sites are used to monitor chemical status in surface waters – rivers (6%), lakes (4%), transitional (6%) and coastal (3%). A similar proportion of water bodies are monitored for chemical status across rivers (5%), lakes (7%), transitional (15%) and coastal (8%) (see figure 4.2).

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



Source: WISE electronic reports

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



Source: WISE electronic reports

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 number 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. The WFD requires that, for the monitoring of Priority Substances in water, the frequency of surveillance monitoring should be at least monthly for one year during the RBMP cycle and for operational monitoring it should occur monthly every year of the RBMP. 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.

Spatial coverage

The percentage of water bodies monitored in the Republic of Ireland RBD is 7.4%, while in the Neagh Bann international RBD the percentage is 5.6%. No data is available for the North Western international RBD. A total of 23 priority substances were monitored across all water body types in the Republic of Ireland RBD, and across rivers, lakes and transitional waters in the Neagh Bann international RBD.

Mercury, hexachlorobenzene and hexachlorobutadiene are monitored in biota in the Republic of Ireland RBD (lake, coastal and transitional waters), and the international Neagh Bann RBD (lake and transitional waters only).

Frequencies

In terms of surveillance monitoring, 27 Priority Substances were monitored at frequencies of 12 times per year for each year of the RBMP, i.e. over a 6 year period; and operational monitoring took place for 17 Priority Substances at the same frequencies and for the same period.

The monitoring frequency for mercury, hexachlorobenzene and hexachlorobutadiene in biota for status assessment is also at a rate of 12 times per year for each year of the RBMP for both the Ireland RBD and the international Neagh Bann RBD.

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 substances⁴⁰ that tend to accumulate in sediment and/or biota, for the purpose of

⁴⁰ Anthracene, brominated diphenylether, cadmium, C10-13 chloroalkanes, DEHP, fluoranthene, hexachlorobenzene, hexabutadiene, hexachlorocyclohexane, lead, mercury, pentachlorobenzene, PAH, Tributyltin.

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

The 2009 European Communities Environmental Objectives (Surface Waters) Regulations set out an obligation for the Environmental Protection Agency to monitor and carry out long-term trend analysis of the concentrations of all 14 Priority Substances in sediment and/or biota, ‘at representative locations deemed appropriate by the Agency’.⁴¹

For rivers, the assessment of long-term trends is conducted at a sub-set of 30 monitoring points, which includes 10 high-status sites of different types aimed particularly at providing early warning of long-term anthropologically influenced trends and of natural variation over time. In terms of lake bodies, all 76 bodies are monitored for long-term trends. For coastal and transitional waters 12 water bodies of high status (4 transitional and 8 coastal), and 26 water bodies of lower status (22 transitional and 4 coastal) are monitored for the purposes of long-term trend assessment.⁴²

Frequencies

Pursuant to the 2009 European Communities Environmental Objectives (Surface Waters) Regulations the monitoring of the 14 priority substances for the purposes of long-term trend assessment is carried out at three yearly intervals across all water body types (rivers, lakes, coastal and transitional waters).⁴³

Monitoring of Priority Substances that are discharged in each RBD

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

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

⁴¹ SI No 272, 2009, <http://www.irishstatutebook.ie/eli/2009/si/272/made/en/print>.

⁴² See ‘Environmental Protection Agency, ‘Ireland Overview of the Water Framework Directive Monitoring Programme (2013-2018), April 2018 https://cdr.eionet.europa.eu/ie/eu/wfd2016/documents/national/envwtneaw/Edited_WFD_NationalMonitoringProgramme_2013-2018_PW_05042018.pdf

⁴³ Ibid.

Across all three RBDs in Ireland 20 Priority Substances were both discharged and listed in inventories of which 17 are monitored. Three Priority Substances are therefore discharged in all three RBDs but not monitored.

Performance of analytical methods used

In Ireland, for 23 priority substances across all three RBDs the analytical methods used meet the minimum performance criteria laid down in Article 4.1 of the technical specifications for chemical analysis and monitoring of water status Directive⁴⁴ (2009/90/EC), and the analytical methods used meet the minimum requirements set out in Article 4.3 of the aforementioned Directive in the case of six priority substances across all three RBDs in Ireland. Within all three RBDs, analytical methods were reported not to meet either Article 4(1) or Article 4(2) for 15 priority substances.

4.1.2 Chemical Status of surface water bodies

Member States are required to report the year on which the assessment of chemical status is based. This may be the year that the surface water body was monitored. In case of grouping this may be the year in which monitoring took place in the surface water bodies within a group that are used to extrapolate results to non-monitored surface water bodies within the same group. The most recent assessment year for all three RBDs in Ireland was 2015.

The chemical status of the majority of water bodies in Ireland is unknown – lakes (91 %), rivers (93 %), coastal (89 %) and transitional waters (84 %). This represents an increase in the number of surface water bodies classified as unknown from 71 % in the first RBMP to 92 % in the second RBMP. This increase is largely attributable to an increase in the percentage of unknown classifications for rivers – from 65 % in the first RBMP to 93 % in the second RBMP.

There has been a large increase in the proportion of surface water bodies classified as unknown from the first (1%) to the second cycle (92%). ‘Expected status in 2015’ is then reported as having no surface water bodies in the ‘unknown’ category.

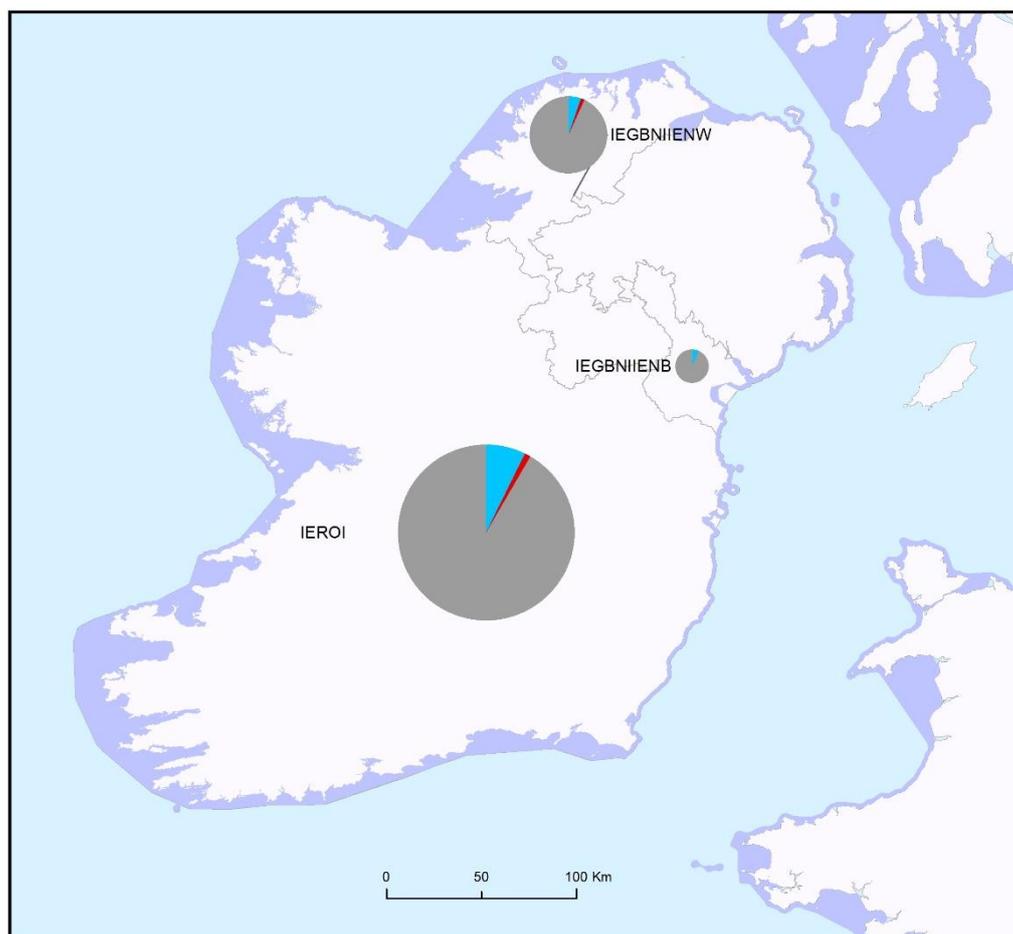
Similarly, there is significant variation in the levels of surface water bodies assessed as of good chemical status from the first cycle (28%), to the second cycle – where there is a decrease to 7% of surface water bodies; and then finally to the ‘expected status in 2015’ where 92% of surface water bodies were expected to reach good chemical status.

These significant variations in both the classification of ‘unknown’ surface water bodies, and the classification of good chemical status levels require to be both justified and clarified.

⁴⁴ 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>

Map 4.1 Chemical status of surface water bodies in Ireland 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)

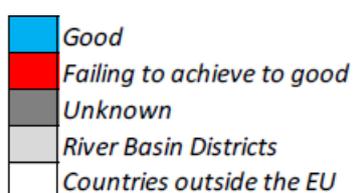


Table 4.1 Chemical status of surface water bodies in Ireland for the second and first RBMP. Note: the number in parenthesis next to the water category is the number of water bodies. Note: Chemical status assessment is based on the standards laid down in EQS Directive 2008/105/EC (version in force on 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.

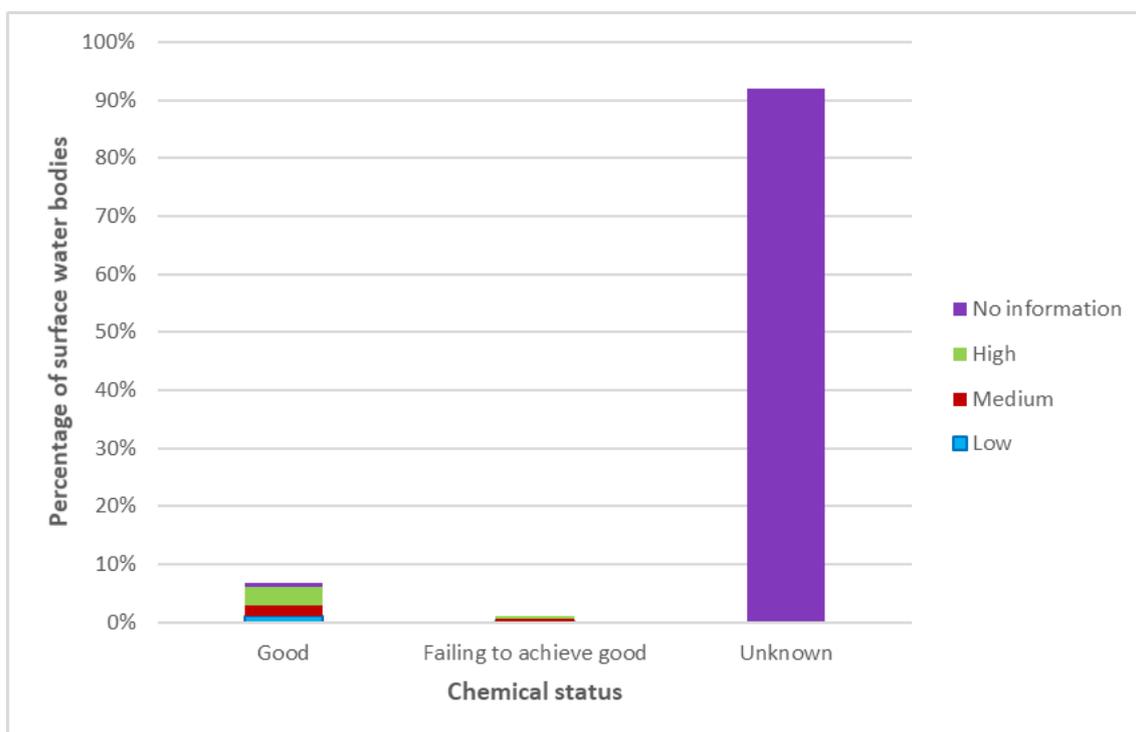
Category	Good		Failing to achieve good		Unknown	
	Number	%	Number	%	Number	%
Second RBMP						
Lakes (812)	58	7.1%	18	2.2%	736	90.6%

Category	Good		Failing to achieve good		Unknown	
	Number	%	Number	%	Number	%
Rivers (3192)	196	6.1%	31	1.0%	2965	92.9%
Coastal (111)	12	10.8%	0	0.0%	99	89.2%
Transitional (195)	31	15.9%	1	0.5%	163	83.6%
Total	297	6.9%	50	1.2%	3963	91.9%
First RBMP						
Lakes (807)	23	2.9%	0	0.0%	784	97.1%
Rivers (4565)	1558	34.1%	32	0.7%	2975	65.2%
Coastal (109)	9	8.3%	3	2.8%	97	89.0%
Transitional (189)	13	6.9%	6	3.2%	170	89.9%
Total	1603	28.3%	41	0.7%	4026	71.0%

Source: WISE Electronic reports

As noted above, for the majority of surface bodies no information is reported to be available for the classification of chemical status of surface water bodies in Ireland.

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



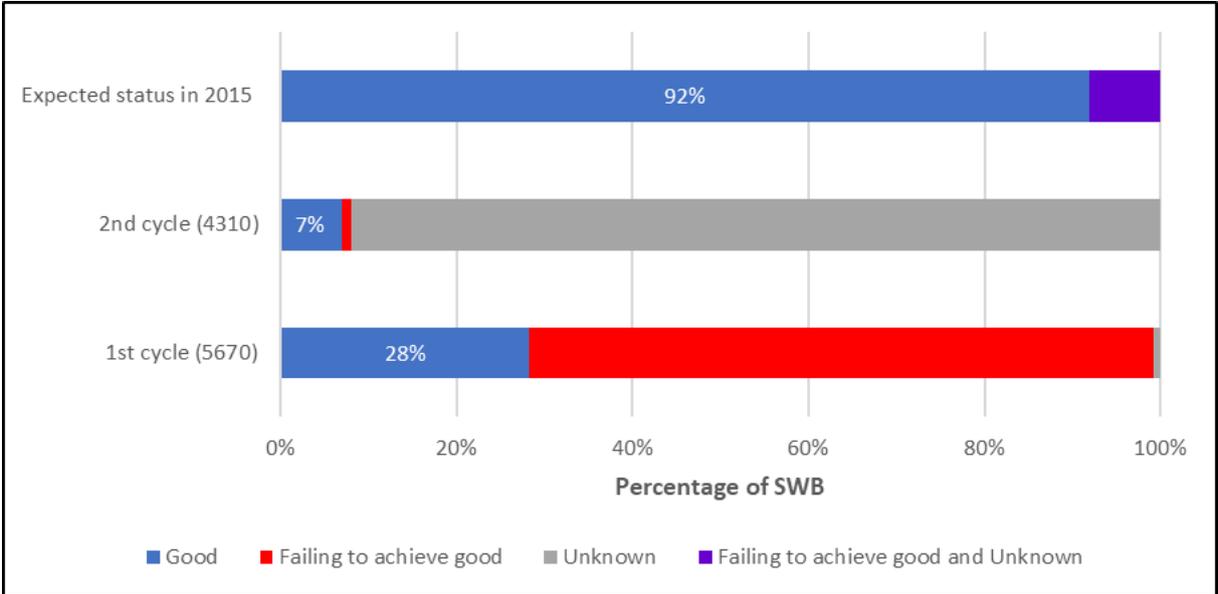
Source: WISE electronic reports

Classification of chemical status is intended to be assessed according to the ‘one-out-all-out’ principle, according to which the failure of one Priority Substance Environmental Quality Standard in a water body results in failure to achieve good status classification for that water body. Explicit reference to the application of the ‘one-out-all-out’ principle with respect to chemical status was made in Ireland.

Figure 4.4 compares the chemical status of surface water bodies in Ireland for the first and second RBMP (based on the most recent assessment status), and the chemical status that was expected by 2015. There was a large increase in the proportion of surface water bodies classified as unknown from the first to the second cycle; and a significant increase in good status from the second cycle to what was expected in 2015 (7% to 92%). Only a small percentage (8%) of surface water bodies were therefore expected to be classified as ‘unknown’ or ‘failing to achieve good chemical status’ in 2015⁴⁵.

. Failures of Hg in biota were not reported as exceedances electronically but reported as a supporting document.

Figure 4.4 Chemical status of surface water bodies in Ireland 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 2015.

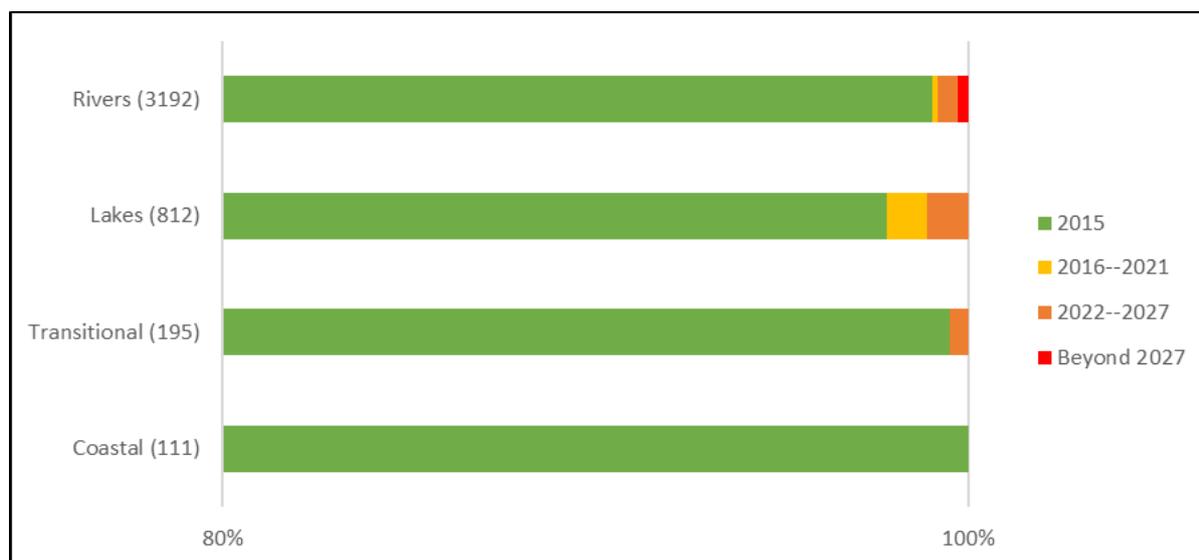


Source: WISE electronic reports

Member States were asked to report the expected date for the achievement of good chemical status. The information for Ireland is shown in Figure 4.5. This figure shows that at least 98% of all water bodies were expected to be at good chemical status by the end of 2015; and only 1% of rivers and coastal waters, and 2% of lakes were expected to fail to achieve good chemical status by the end of 2015.

⁴⁵ Ireland subsequently informed the Commission that ‘unknown’ was reported if not monitored

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



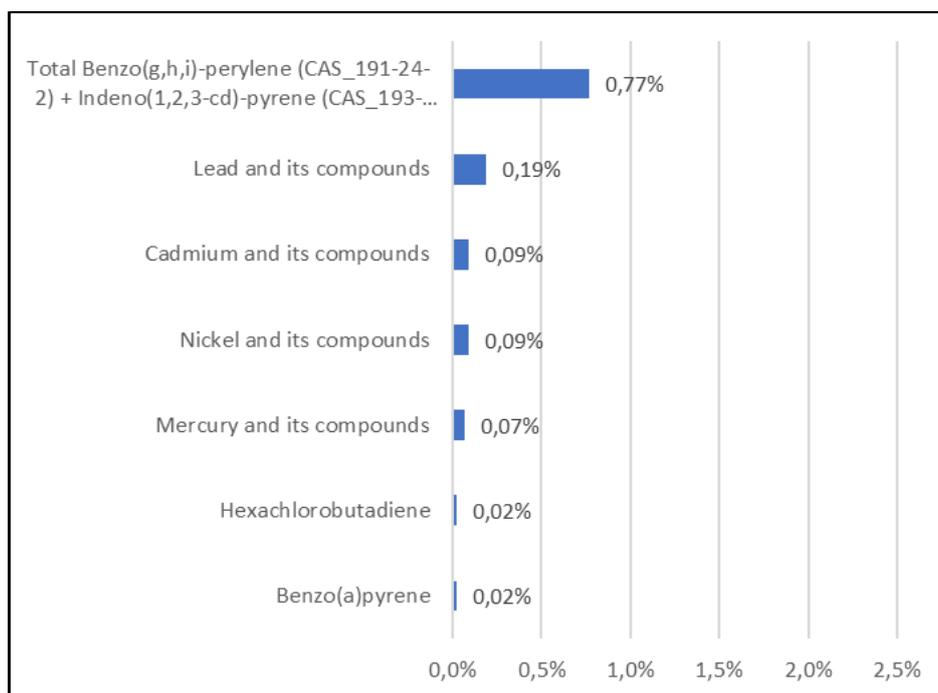
Source: WISE electronic reports

Priority Substances causing the failure of good chemical status

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

Figure 4.6 provides information on the top seven priority substances causing the greatest proportion of water bodies to fail good chemical status, with the largest contributor being total *Benzo(g,h,i)-perylene* (CAS_191-24-2) and *Indeno(1,2,3-cd)-pyrene* (CAS_193-39-5).

Figure 4.6 The top Priority Substances causing failure to achieve good chemical status in surface water bodies in Ireland



Source: WISE electronic reports

Ubiquitous persistent, bioaccumulative and toxic Priority Substances

According to article 8(a) of the EQS Directive⁴⁶, eight priority substances and groups of priority substances are behaving like ubiquitous, persistent, bioaccumulative and toxic substances⁴⁷. 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 influence of ubiquitous persistent, bioaccumulative and toxic Priority Substances on the assessment of chemical status in Ireland is limited. Overall 1% of surface water bodies with ubiquitous, persistent, bioaccumulative and toxic substances fail to achieve good chemical status⁴⁸.

In Ireland 27 Priority Substances are used in the assessment of chemical status within all three RBDs.

⁴⁶ Amended by Directive 2013/39/EU

⁴⁷ Brominated diphenylether, Mercury and its compounds, Polyaromatic hydrocarbons (PAH), Tributyltin, PFOS, dioxins, hexabromocyclodecane and heptachlor

⁴⁸ Ireland subsequently informed that Hg in biota had almost universal exceedances, and that even though not electronically reported, failure of Hg in biota was documented in a supporting document in WISE.

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

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

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

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.

According to data submitted to WISE, mixing zones have not been designated in Ireland.

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.

According to WISE, no natural background concentrations for metals and their compounds, or the bioavailability of metals, were taken into consideration for the three RBDs in Ireland.⁴⁹

4.2 Main changes in implementation and compliance since the first cycle

In Ireland, only a small percentage of sites are used to monitor chemical status in surface waters – 6% (rivers), 4% (lakes), 3% (coastal), and 6% (transitional). A similar proportion of water bodies are monitored for chemical status across rivers (5%), lakes (7%), coastal (8%) and transitional (15%) waters. No data are provided on the first RBMP on the number of sites used to monitor the chemical status of surface water.

⁴⁹ Ireland subsequently informed the Commission that bioavailability was not used for surface waters (rivers and lakes) in 2010-2015, as a necessary parameter (DOC) was not routinely analysed at these sites until midway through the cycle.

The percentage of surface water bodies in Ireland with good chemical status between the first and second RBMP has experienced a reduction from 28% to 7%, although it was expected that 92% of surface water bodies would achieve good status by 2015. As noted in the second RBMP, this figure excludes widespread pollutants, such as *mercury* and *PAHs*. Other substances that have exceeded standards include metals (cadmium, lead and nickel), two pesticides (*atrazine* and *simazine*) and the plasticiser *Di(2ethylhexyl)-phthalate* (DEHP).

4.3 Progress with Commission recommendation

The Commission recommendations based on the first RBMPs and PoM requested action on the following:

- Recommendation: *Mercury, hexachlorobenzene and hexachlorobutadiene should be among the substances monitored in biota (for comparison with the biota standards in the EQSD) to assess chemical status, unless water EQS providing an equivalent level of protection have been derived.*

Assessment: Ireland reports that *hexachlorobenzene, mercury and hexachlorobutadiene* are monitored in biota for status. This recommendation has therefore been 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

There are total of 513 groundwater bodies in Ireland (Table 2.3). In the first RBMP a total of 756 groundwater bodies were reported. The number of groundwater bodies in the second RBMP has therefore decreased by 32% due to a review of the characterisation undertaken following the first cycle. Conversely, there has been a slight increase in the total groundwater body area from the first RBMP (71,064 km²), to the second RBMP (71, 593 km²).

In the second cycle, 45 groundwater bodies are subject to monitoring for quantitative status, which means that 91% of groundwater bodies are not monitored. In the Republic of Ireland RBD, 10% of groundwater bodies are monitored for quantitative status, and 11% of the groundwater bodies are monitored for quantitative in the Neagh Bann international RBD. No data are available in WISE for the North Western international RBD. For the Republic of Ireland RBD and the Neagh Bann international RBD, there are a total of 39 groundwater monitoring sites for quantitative status. This compares to 186 groundwater monitoring sites for quantitative status during the first cycle – 15 of these sites were located in the North Western international RBD⁵⁰.

All 513 groundwater bodies are identified as Drinking Water Protected Areas.

⁵⁰ Ireland subsequently informed that 59 groundwater level monitoring sites for quantitative status were reported during the 2nd cycle. Four of these were reported in the North Western International RBD. Additionally, Ireland is also monitoring approximately 70 additional locations where groundwater levels and quality are assessed nationally. Ten of these were reported in the North Western International RBD. All of them were submitted in WISE. Ireland also undertook quantitative flow and water level monitoring at approximately 20 groundwater springs, which assisted with Irish water quality assessments and has not been used for quantitative classification. Therefore, these were not reported as quantitative monitoring in the electronic WISE submission.

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

BRD	Total Groundwater bodies directly monitored	Monitoring Purpose												
		AGR - Groundwater abstraction site for irrigation	CHE - Chemical status	DRI - Groundwater abstraction site for human consumption	DWD - Drinking water - WFD Annex IV.1.i	HAB - Protection of habitats or species depending on water - WFD Annex IV.1.v	IND - Groundwater abstraction site for industrial supply	INV - Investigative monitoring	NID - Nutrient sensitive area under the Nitrates Directive - WFD Annex IV.1.v	OPE - Operational monitoring	QUA - Quantitative status	SOE - EIONET State of Environment monitoring	SUR - Surveillance monitoring	TRE - Chemical trend assessment
IEGBNIIENB	7	0	7							2	2	7	7	7
IEGBNIIENW		0												
IEROI	125	0	114	1						59	37	111	114	114

Source: WISE Electronic reports

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

BRD	No. of groundwater bodies with quantitative monitoring	Total No. groundwater bodies	% of total groundwater bodies monitored for quantitative status
IEGBNIIENB	2	18	11.1
IEGBNIIENW		61	0.0
IEROI	43	434	9.9

Source: WISE Electronic reports

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

BRD	Total Groundwater monitoring sites	Monitoring Purpose												
		AGR - Groundwater abstraction site for irrigation	CHE - Chemical status	DRI - Groundwater abstraction site for human consumption	DWD - Drinking water - WFD Annex IV.1.i	HAB - Protection of habitats or species depending on water - WFD Annex IV.1.v	IND - Groundwater abstraction site for industrial supply	INV - Investigative monitoring	NID - Nutrient sensitive area under the Nitrates Directive - WFD Annex IV.1.v	OPE - Operational monitoring	QUA - Quantitative status	SOE - EIONET State of Environment monitoring	SUR - Surveillance monitoring	TRE - Chemical trend assessment
IEGBNII ENB	13		8							2	5	8	8	8
IEGBNII ENW														
IEROI	296		245	1						104	60	189	245	235

Source: WISE Electronic reports

5.1.2 Assessment and classification of quantitative status for groundwater

Pursuant the European Communities Environmental Objectives (Groundwater) Regulations,⁵¹ the Environmental Protection Agency has responsibility for establishing a series of conditions and related tests, based on WFD and GWD criteria, that must be satisfied in order for groundwater bodies to achieve good (chemical and quantitative) groundwater status. There are four quantitative tests (saline and other intrusions, surface water, groundwater dependent ecosystems and water balance). Worst-case classifications for chemical and quantitative status test are reported as the overall groundwater body status.

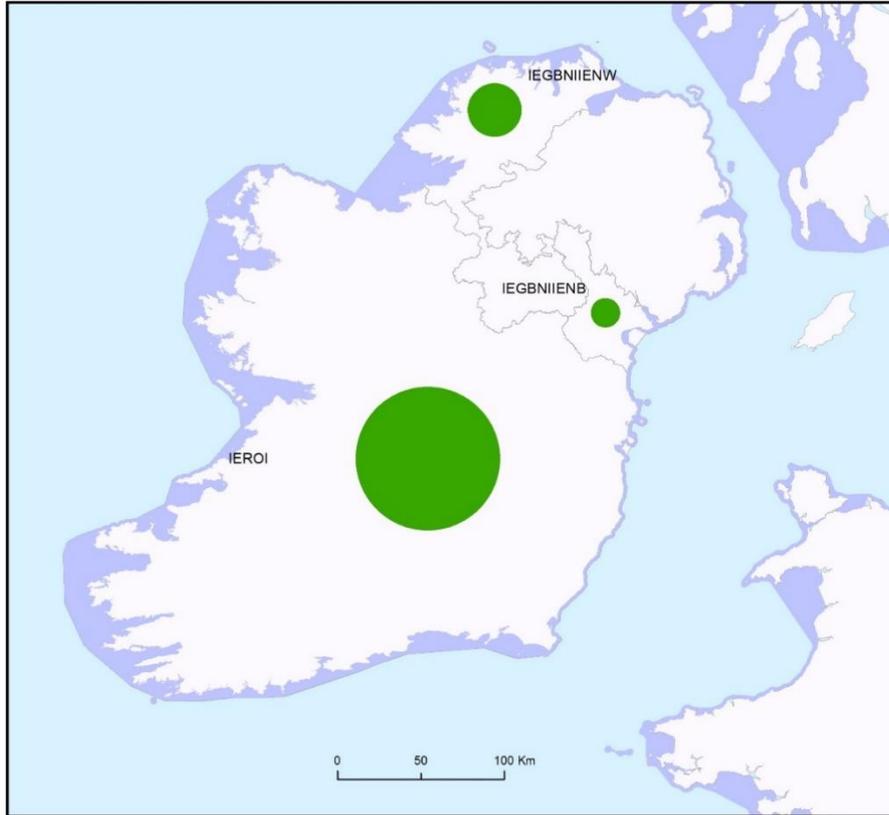
Map 5.1 displays the most recent assessment of quantitative status of groundwater bodies. It shows that 99.8% of groundwater bodies are in good quantitative status. Figure 5.2 illustrates the confidence in status classification in the second RBMP and demonstrates that confidence is high or good for 100% of groundwater bodies.⁵² The quantitative status of groundwater bodies in the second RBMP aligns closely with the first RBMP where it was reported that 99.5% of groundwater bodies were of good quantitative status, and only four groundwater bodies were assessed to be in poor status in Ireland. Only one groundwater body is identified as of poor quantitative status in the second RBMP. The reason for this groundwater body failing good status is due to groundwater dependent terrestrial ecosystems (see section 5.1.3).

The WFD requires regulation of abstractions that are likely to have a significant effect on water status. In Ireland, the Environmental Protection Agency has undertaken a quantitative assessment of abstraction amounts and compared them to groundwater levels. The assessment suggests that the levels of risk due to abstraction levels is low. Out of a total of the 513 groundwater bodies in Ireland, 41 (8 %) were identified for further review to determine whether they pose a risk to environmental objectives.

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

⁵¹ SI No 9, 2010, <http://www.irishstatutebook.ie/eli/2010/si/9/made/en/print>.

⁵² Confidence is classified as high where there is extensive monitoring and/or good supporting evidence of groundwater contribution, see http://www.epa.ie/wfdstatus/groundwater/GW_Groundwater_Chemical_Quantitative_Status_Methology_TV_s_and_Trends_June_10_Final_Dec10.pdf.

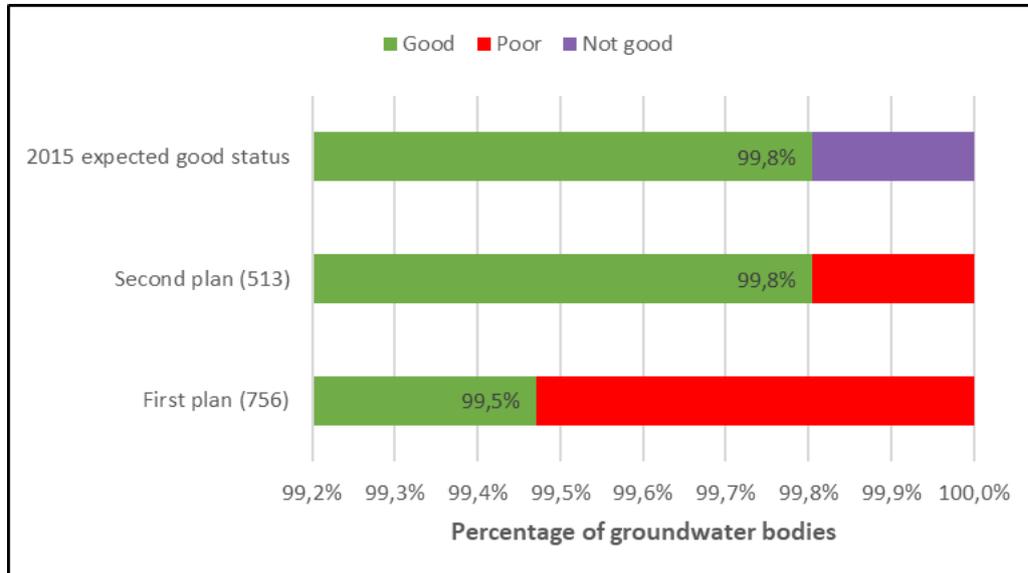


*Note: Standard colours based on WFD Annex V, Article 2 (2) (4)
Source: WISE, Eurostat (country borders)*

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

In Ireland, all 513 groundwater bodies are reported to be associated with surface waters. Groundwater dependent territorial ecosystems were reported in all RBDs. Only one groundwater body in Ireland RBD has been identified as related to a risk.

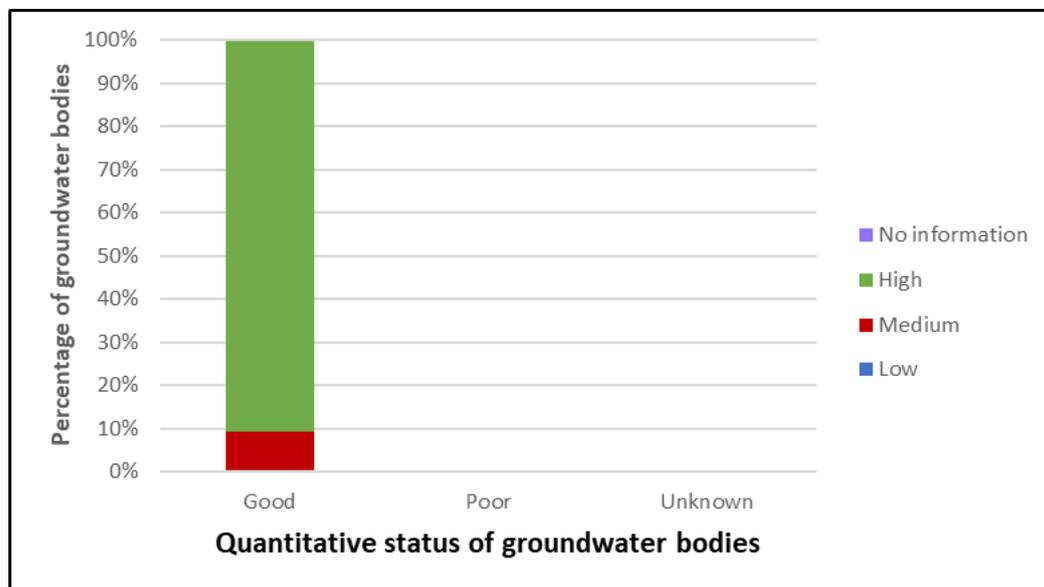
Figure 5.1 Quantitative status of groundwater bodies in Ireland for the second RBMPs, for the first RBMPs and expected in 2015. The number in the parenthesis is the number of groundwater bodies for both cycles. Note the period of the assessment of status for the second RBMPs was 2009 – 2015. The year of the assessment of status for first RBMPs is not known



Source: WISE

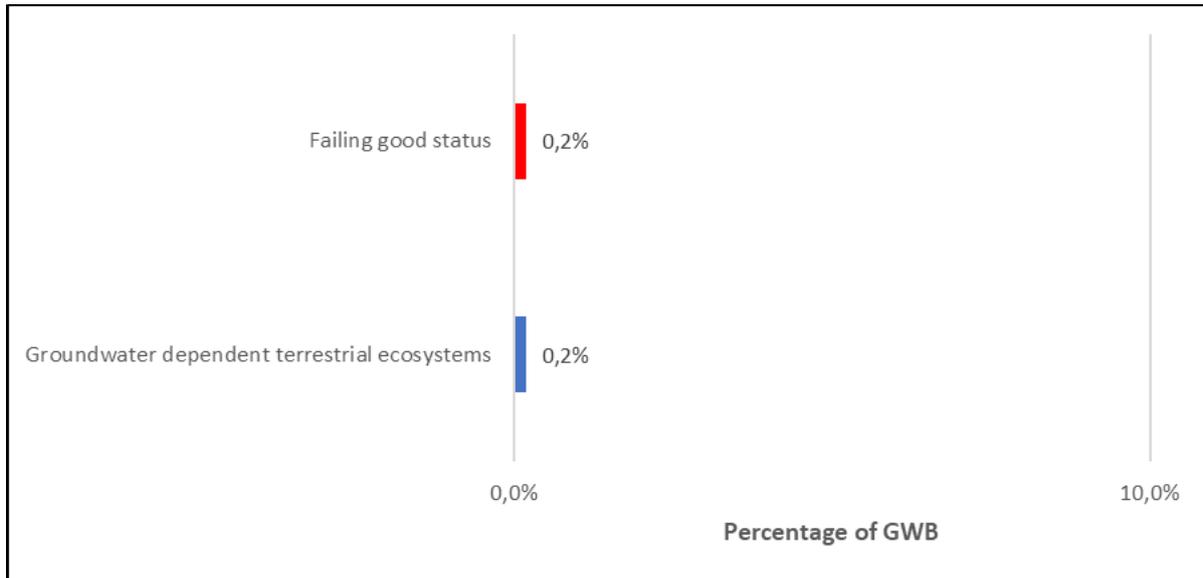
electronic reports

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



Source: WISE electronic reports

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



Source: WISE electronic reports

Notes:

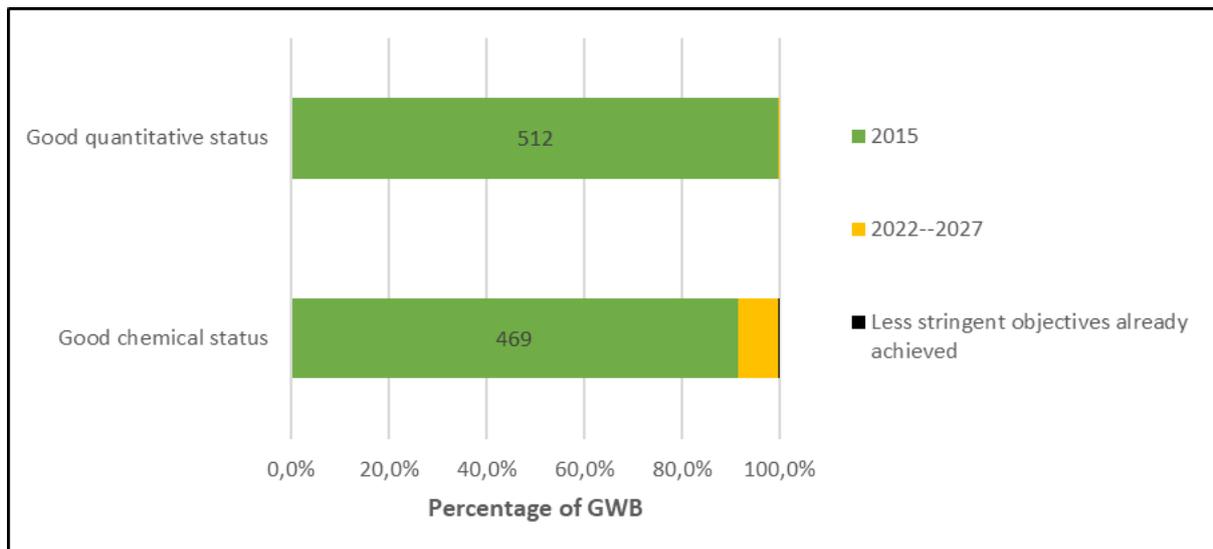
‘Water balance’ = long-term annual average rate of abstraction exceeds the available groundwater resource which may result in a decrease of groundwater levels.

‘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 Ireland. 513 groundwater bodies delineated for the second RBMP.



Source: WISE electronic reports

5.2 Main changes in implementation and compliance since the first cycle

There has been a decrease of 32% in the number of groundwater bodies from the first RBMP (756) to the second RBMP (513). However, the total groundwater body area between the two cycles has increased from 71,064km² to 71,593km².

In the absence of data in WISE for the North Western international RBD for the second cycle, it is difficult to accurately assess the changes in terms of groundwater monitoring sites from the first to the second cycle. However, it would appear that there has been a significant fall in the number of groundwater monitoring sites for quantitative status from the first to the second cycle, and only a small percentage (9%) of groundwater bodies are monitored for quantitative status.

The number of groundwater bodies assessed as achieving good quantitative status has remained high between the first and the second cycles. In the first cycle 99.5% of groundwater bodies achieved good quantitative status, and in the second cycle this has slightly increased to 99.8%. Conversely, only one groundwater body is assessed as failing good status in the second cycle, compared to 4 groundwater bodies in the first cycle.

5.3 Progress with Commission recommendations

There were no recommendations from the first RBMPs for this topic.

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

In Ireland there is a total of 513 groundwater bodies identified in the second RBMP. A total of 121 groundwater bodies have been reported as being subject to surveillance monitoring, and 61 are subject to operational monitoring. However, no data is available on the monitoring purposes of groundwater bodies for the North Western International RBD. Overall, there has been a reduction in the number of groundwater bodies between the first and second cycle from 756 to 513.

None of the groundwater bodies in Ireland are classified as being ‘At Risk’ of failing good chemical status.

The national groundwater quality monitoring networks has undergone significant development between the first and second cycles, with new sites added to the network. Approximately 5% of groundwater water quality sites have also been lost due to the decommissioning of water supply. The monitoring of pesticides and organics have moved from operational monitoring during the first cycle to surveillance monitoring during the second cycle due to the low level of detections of groundwater bodies ‘at risk’ of failing WFD objectives from these pressures. Chemical monitoring sites have been installed in six poorly productive typology settings rather than ten settings, as indicated in the first cycle, and an additional karst typology setting has been added.⁵³

In the second cycle, 253 surveillance monitoring sites were reported across two of the three RBDs in Ireland (Republic of Ireland RBD and Neagh Bann international RBD). No data was available in WISE for the North Western international RBD. This represents a slight reduction (8%) from the first cycle where it was reported that 274 surveillance monitoring sites were in place across all 7 RBDs. In the first cycle 17 sites were reported to be in place for the North Western International RBD.

In the second cycle, 106 operational monitoring sites were reported to be in place within the Ireland RBD and the Neagh Bann international RBD. No data was available in WISE regarding the North Western international RBD. 112 operational monitoring sites were reported during the first cycle. For the first cycle, one of those operational sites was reported to be in the North Western international RBD. In general, there has therefore been a reduction in operational monitoring sites between the first and second cycle.

⁵³ See ‘Environmental Protection Agency, ‘Ireland Overview of the Water Framework Directive Monitoring Programme (2013-2018), April 2018, https://cdr.eionet.europa.eu/ie/eu/wfd2016/documents/national/envwtneaw/Edited_WFD_NationalMonitoringProgramme_2013-2018_PW_05042018.pdf.

A standard suite of water quality determinants are analysed at each monitoring location with the surveillance and operational monitoring networks in Ireland, including oxygen content, pH, conductivity, nitrate, ammonium, major ions and certain minor ions and metals.⁵⁴

6.1.2 Assessment and classification of chemical status in groundwater

As noted in section 5.12, the European Communities Environmental Objectives (Groundwater) Regulations 2010, sets out the requirements for the assessment of both groundwater quantitative and chemical status. Pursuant to the regulations, the Environmental Protection Agency has the responsibility for establishing a list of Threshold Values for pollutants in groundwater, which are used as triggers to help determine whether the conditions for good chemical status are being met. A series of conduction related tests, based on WFD and GWD criteria, must be satisfied in order for groundwater bodies to achieve good chemical (and quantitative) groundwater status. The five chemical tests concern saline or other intrusions, surface water, groundwater dependant terrestrial ecosystems, drinking water protected areas and a general quality assessment. Each test is applied independently, and the results combined to give an overall assessment of groundwater body chemical status.

During the second cycle, 512 groundwater bodies have been reported to be of good chemical and 469 groundwater bodies have been reported to be of good quantitative status. 44 groundwater bodies are reported to be of poor chemical status. The total area of groundwater bodies of poor status in Ireland is 667 km².

As illustrated in figure 6.2 confidence in the classification of good chemical status in groundwater ranges from medium to high, and confidence in the classification of poor chemical status is high in all cases.

The 44 groundwater bodies (8.6%) that are of poor chemical status are generally small and the significant pressures typically relate to large historic contamination from point sources, including mines, landfills and industry.⁵⁵

Across all three RBDs in Ireland it was reported that method three (proportion of the total volume of the groundwater body represented by monitoring sites exceeding a groundwater quality standard or threshold value compared to the total volume of the whole) was used.

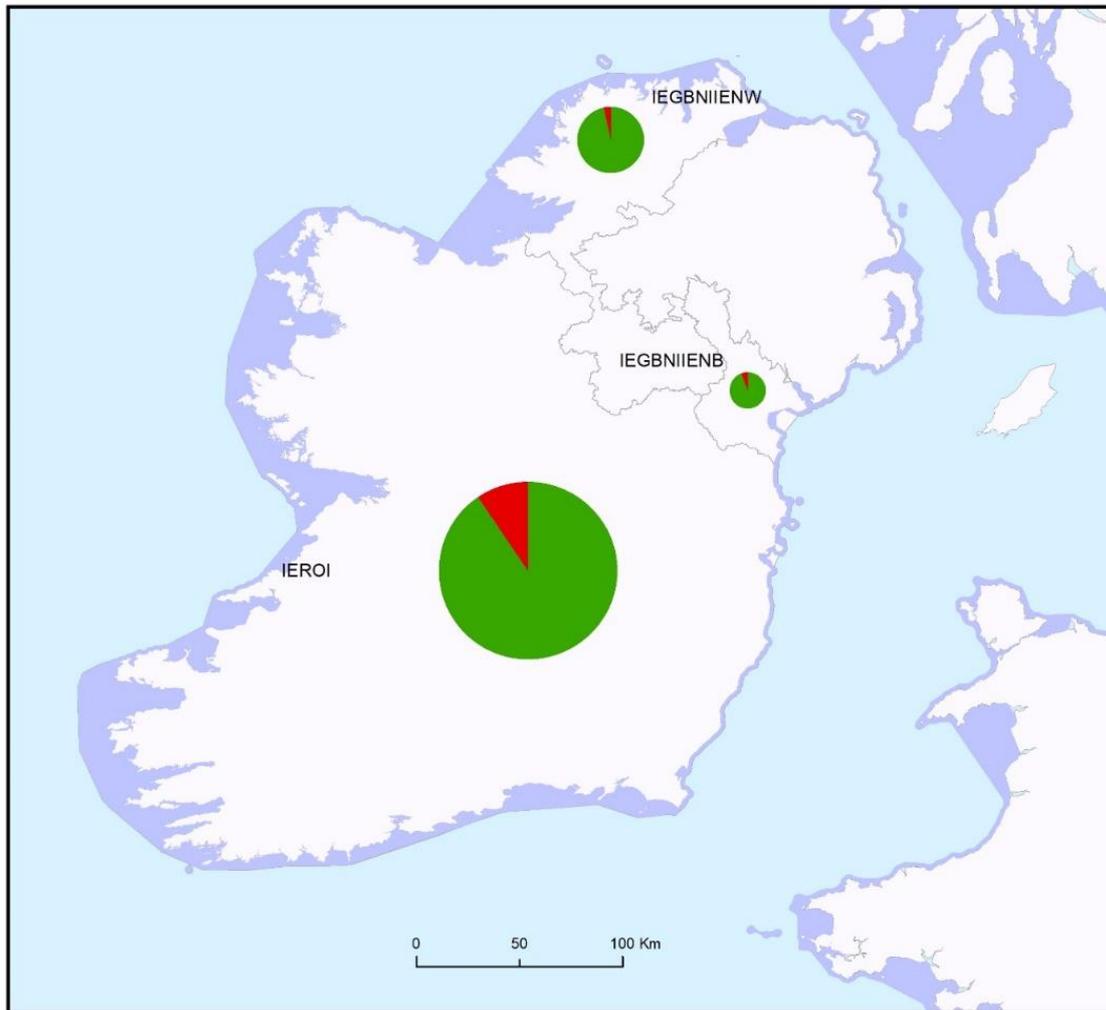
For Ireland threshold values were established for ammonium in the two international RBDs (Neagh Bann and North Western). In the Republic of Ireland RBD, 17 substances have been considered, including seven of the substances contained in Annex II of the Groundwater Directive (Tetrachloroethylene, Ammonium, Lead, Mercury, Arsenic, Phosphorus and Trichloroethylene).

In all three of the RBDs in Ireland background levels have been considered in the status assessment but not in the threshold value establishment.

⁵⁴ Environmental Protection Agency, 'Groundwater quality monitoring', <http://www.epa.ie/water/wm/groundwater/quality>.

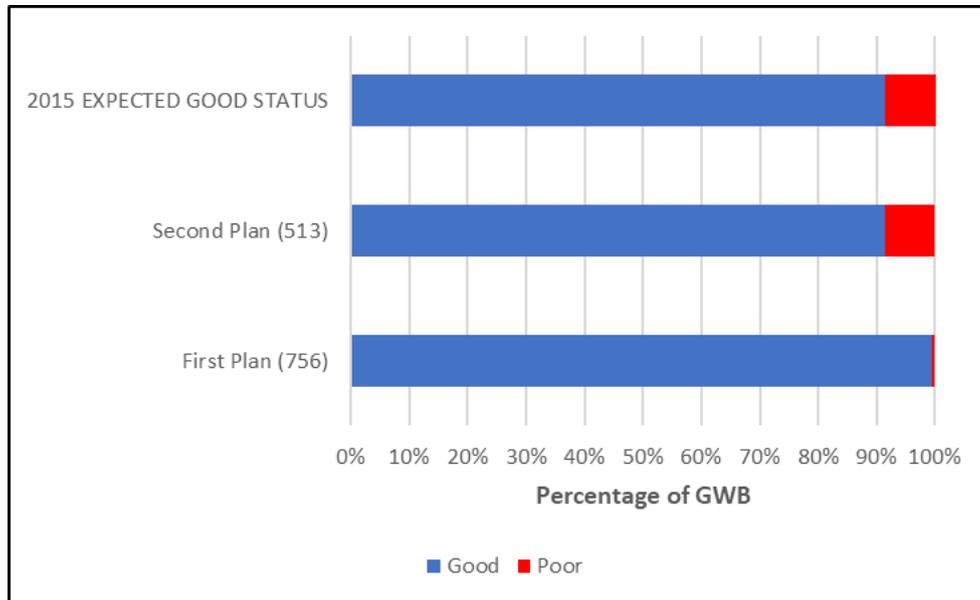
⁵⁵ Environmental Protection Agency, 'EPA Water Quality in Ireland 2010 – 2015', http://cdr.eionet.europa.eu/ie/eu/wfd2016/documents/national/envwtnbha/Water Quality in Ireland 2010-2015_Report.pdf.

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



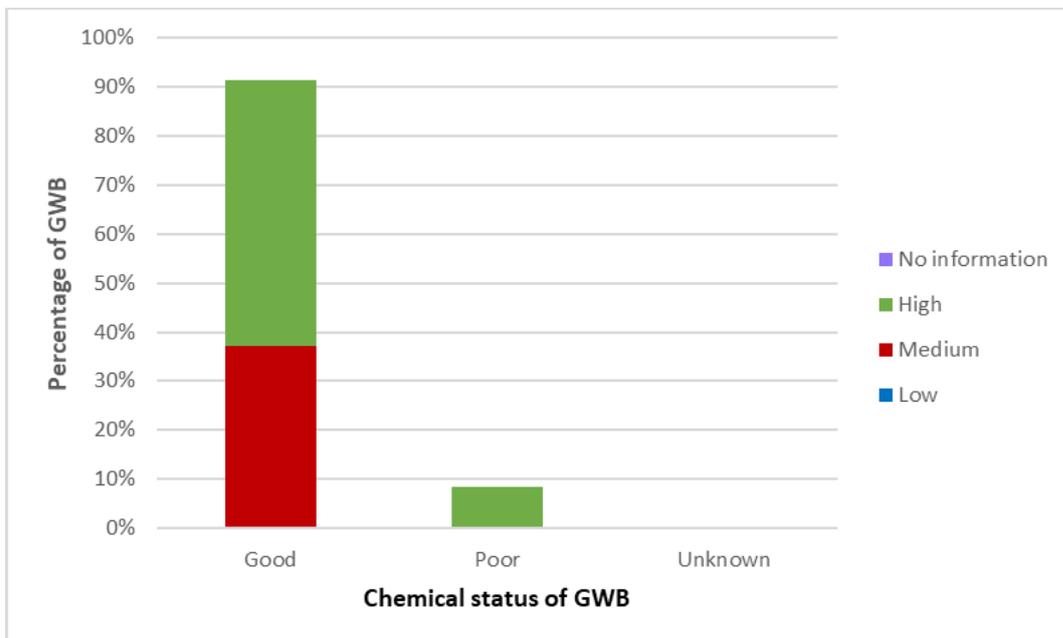
*Note: Standard colours based on WFD Annex V, Article 2.4.5.
Source: WISE, Eurostat (country borders)*

Figure 6.1 Chemical status of groundwater bodies in Ireland for the second RBMPs, for the first RBMPs 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 plan was 2009 to 2015. The year of the assessment of status for the first RBMPs is not known



Source: WISE electronic reports

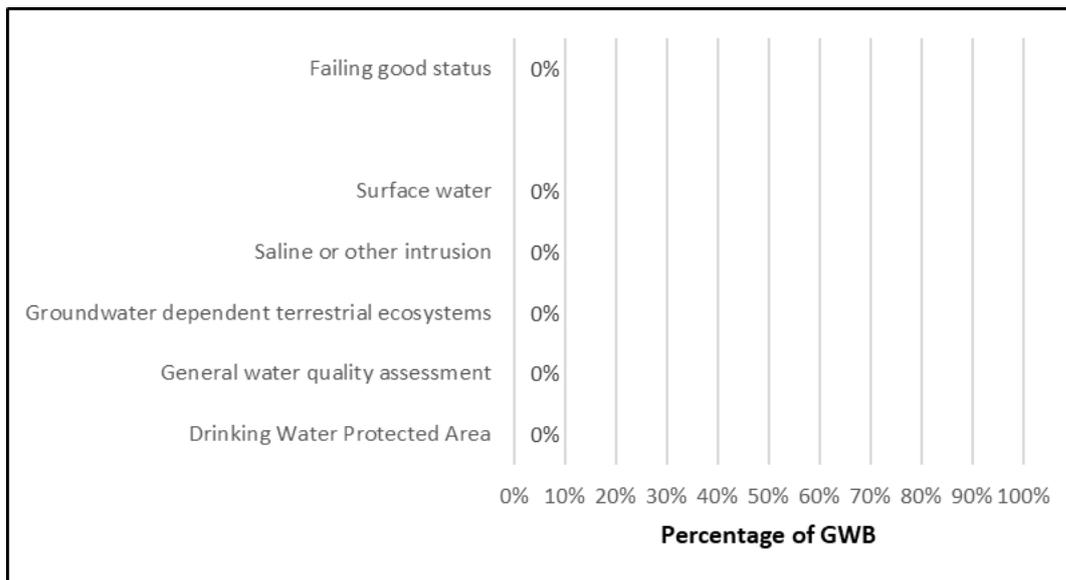
Figure 6.2 Confidence in the classification of chemical status of groundwater bodies in Ireland based on the most recent assessment of status



Source:

WISE electronic reports

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

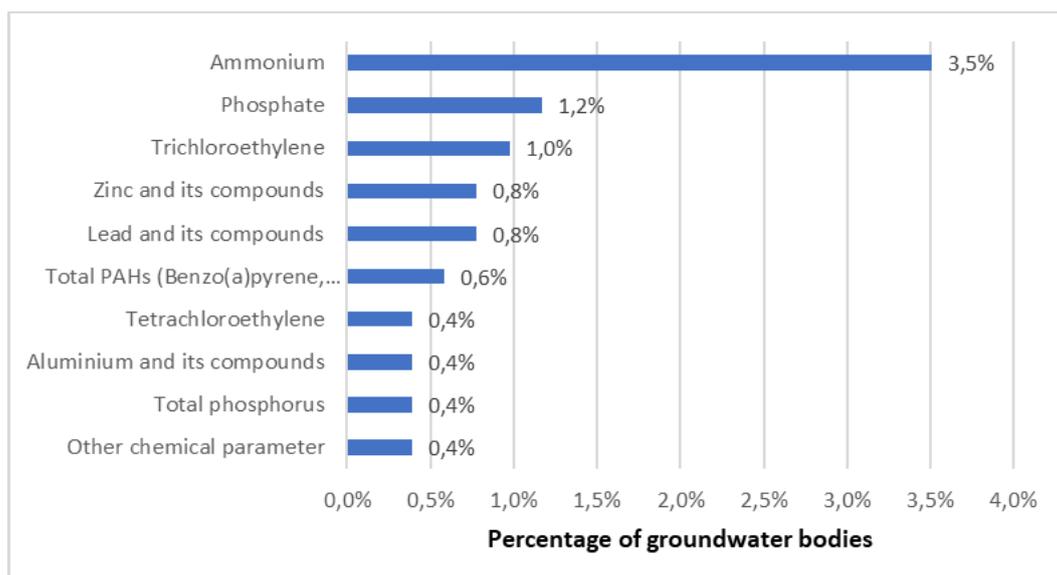


Source:

WISE electronic reports

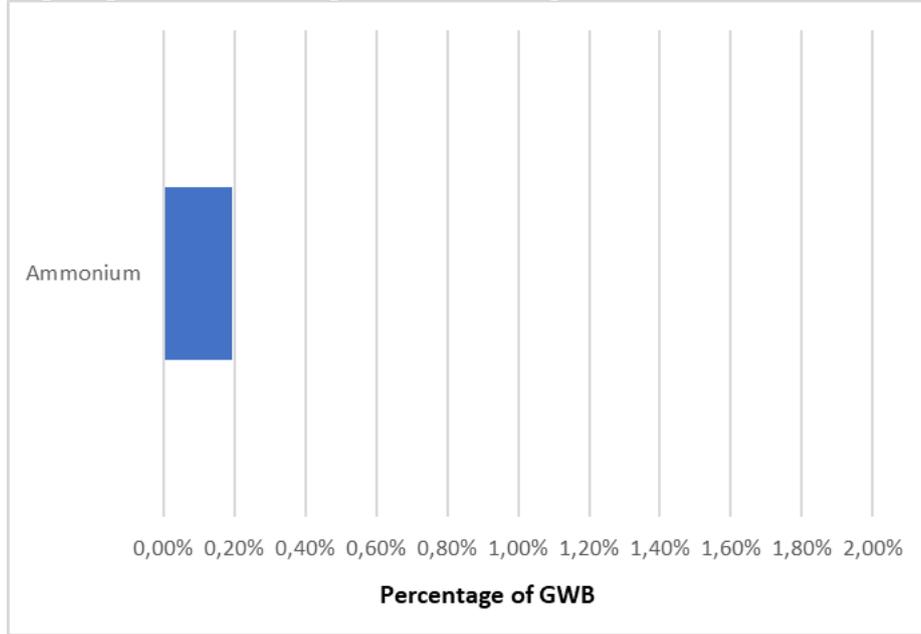
Notes: ‘Surface water’ = Failure to achieve Environmental Objectives (Article 4 WFD) in associated surface water bodies or significant diminution of the ecological or chemical status of such surface water bodies.
 ‘Groundwater dependent terrestrial ecosystems’ = Significant damage to terrestrial ecosystems 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 Ireland



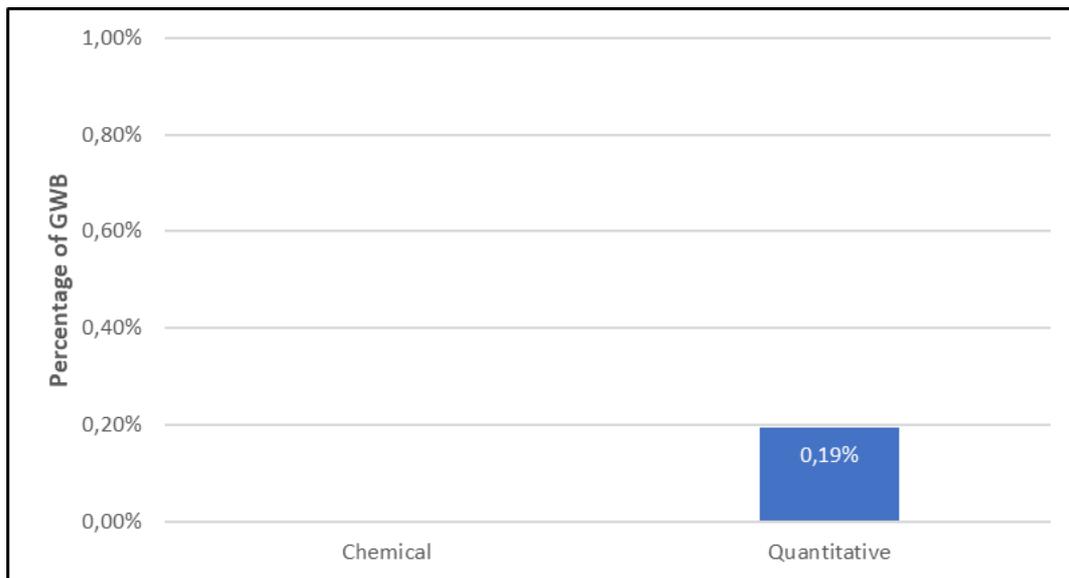
Source: WISE electronic reports

Figure 6.5 Top 10 pollutants with upward trends in groundwater bodies in Ireland



Source: WISE electronic reports

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



Source: WISE electronic reports

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

In Ireland all 513 groundwater bodies are reported as being associated with groundwater dependent terrestrial ecosystems. There are no RBDs with a related risk. 44 groundwater bodies are reported as failing good chemical status.

Both groundwater dependent terrestrial ecosystems and groundwater associated aquatic ecosystems were considered in the status assessments for all three RBDs in Ireland.

6.2 Main changes in implementation and compliance since the first cycle

In Ireland the number of groundwater bodies have decreased from the first cycle to the second cycle from 756 to 513. In terms of chemical status, 85% of groundwater bodies achieved good chemical status in the first cycle compared to 91% of groundwater bodies in the second cycle. In terms of area, this has meant that 99% of groundwater bodies (70, 926 km²) reached good chemical status in the second cycle, compared to 85% of groundwater bodies (61, 322 km²) in the first cycle.

This means that in the second cycle 9% of groundwater body area is failing good chemical status, i.e. 667 km², which equates to 44 water bodies. This reflects a reduction in the percentage of groundwater body area failing good chemical status from the first to the second cycle. In the first cycle, 15% or 112 groundwater bodies were failing good chemical status, which represented an area of 10,433 km².

A complete comparison of operational and surveillance monitoring between the first and second RBMPs is problematic as no data on monitoring is available for the North Western International RBD in the second cycle. When excluding the North Western International RBD, and comparing other RBDs the total number of groundwater monitoring sites during the first cycle was 338, compared to 309 in the second cycle.

6.3 Progress with Commission recommendations

There were no recommendation from the first RBMPs for this topic.

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

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

7.1.1 Designation of Heavily Modified and Artificial Water Bodies

In Ireland there are a total of 33 heavily modified water bodies. No artificial water bodies were reported. The heavily modified water bodies make up less than 1% of all water bodies. One is situated in the Neagh Bann international RBD, six are located in the North Western international RBD, and the remaining 26 artificial water bodies are in the Republic of Ireland RBD. ⁵⁶

In the first cycle a total of 26 water bodies were identified as either artificial or heavily modified water bodies. There has therefore been a slight increase in the number of heavily modified water bodies between the first and second cycle. In the first cycle five water bodies were identified as heavily modified or artificial water bodies in the North Western international RBD compared to six in the second cycle; and for the Neagh Bann international RBD, no water body was identified as heavily modified or artificial in the first cycle compared to one in the second cycle.

In Ireland, a total of 11 reservoirs were identified as originally being rivers: one in the North Western international RBD, and the other ten in the Republic of Ireland RBD. A total of five reservoirs were originally lakes, three of which are located in the North Western International RBD and two are located in the Republic of Ireland RBD. No data is available in this regard for either rivers or lakes in the Neagh Bann international RBD.

For four of the river water bodies that were designated as heavily modified in the Republic of Ireland RBD, two were designated as heavily modified due to flood protection, with the remaining two designated on the basis of drinking water supply and nature protection and other ecological uses. In relation to lakes, 19 water bodies were designated as heavily modified on the basis of hydropower (10) and drinking water supply (9). The main uses for which transitional water bodies were designated as heavily modified were navigation/ ports (8), urban development (1) and 'other' uses (1). Only three coastal waters were identified as heavily modified as a result of 'other' uses (1) and navigational ports (2).

The main physical alterations of heavily modified river water bodies within the Republic of Ireland RBD are reported as being channelization/ straightening/ bed stabilisation/ bank reinforcement, dredging/ channel maintenance, weirs/ dam/ reservoir and 'other'. For lake waters in the Republic of Ireland RBD and the North Western International RBD, the main physical alteration was identified as weirs/ dam/ reservoir. Land reclamation/ coastal modifications/ ports were identified as the main physical alternation for both transitional and coastal waters in the Republic of Ireland RBD.

⁵⁶ Ireland subsequently informed the commission that Artificial Water Bodies (14 canals), were reported in the RBMP, but not in the WISE database due to constraints with spatial datasets.

The methodology for heavily modified water bodies designation is set out in the *Guidance on thresholds and Methodology to be Applied in Ireland's River Basin Districts*⁵⁷. Pursuant to Water Policy Regulations⁵⁸, the Environmental Protection Agency has the responsibility for the designation of heavily modified water bodies.

The methodology for heavily modified water bodies designation in Ireland is based upon the stepwise approach, as set out in CIS Working Group 2.2. "Policy Summary to Guidance Document No. 4 Identification and Designation of Heavily Modified and Artificial Water Bodies"⁵⁹, Morphological and Hydrological risk assessments inform the screening steps based on four categories of risk (at risk; probably at risk; probably not at risk; and not at risk). Water bodies 'at risk', are then further considered under the heavily modified bodies designation. The specific pressures placing the water body in the 'at risk' category are then identified. For rivers and lakes these pressures may include channelization and dredging, flood protection and embankments, impounding (dams), water regulation (locks and weirs), intensive land use and abstractions. Pressures concerning coastal and transitional waters include dredging, dumping of dredge spoil, coastal defence and embankments, build structures, intensive land use, and abstractions. A stakeholder workshop then reviews these pressures to assess whether they cause 'substantial change' to the water body character and therefore warrant further consideration. Information on the ecological status of water bodies was gathered by utilising the latest available water quality information (Q-value, fish population information, trophic status) for each water body. For rivers, Q-values were used as a proxy for ecological status. River bodies with Q-value of 3-4 or lower proceed for further consideration as heavily modified water bodies. For each water body of Q3-4 or lower, historical quality records are compiled in order to examine the correlation between water body status and hydromorphological/ morphological change. Following case by case consideration by experts, an observed river water body status of less than Q4 directly attributable to hydromorphological alterations satisfied the criterion for heavily modified water body designation.

The Department of Housing, Planning and Local Government aim to have a statutory control regime in place to manage activities affecting the physical condition of the water environment by the 3rd RBMP. In preparation for this, work is underway by the Environmental Protection Agency, in collaboration with other bodies, to further develop systems for assessing hydromorphological conditions. A more comprehensive and objective means of measuring distance from natural conditions and reaching decisions on whether a water body is significantly modified is envisaged.

⁵⁷

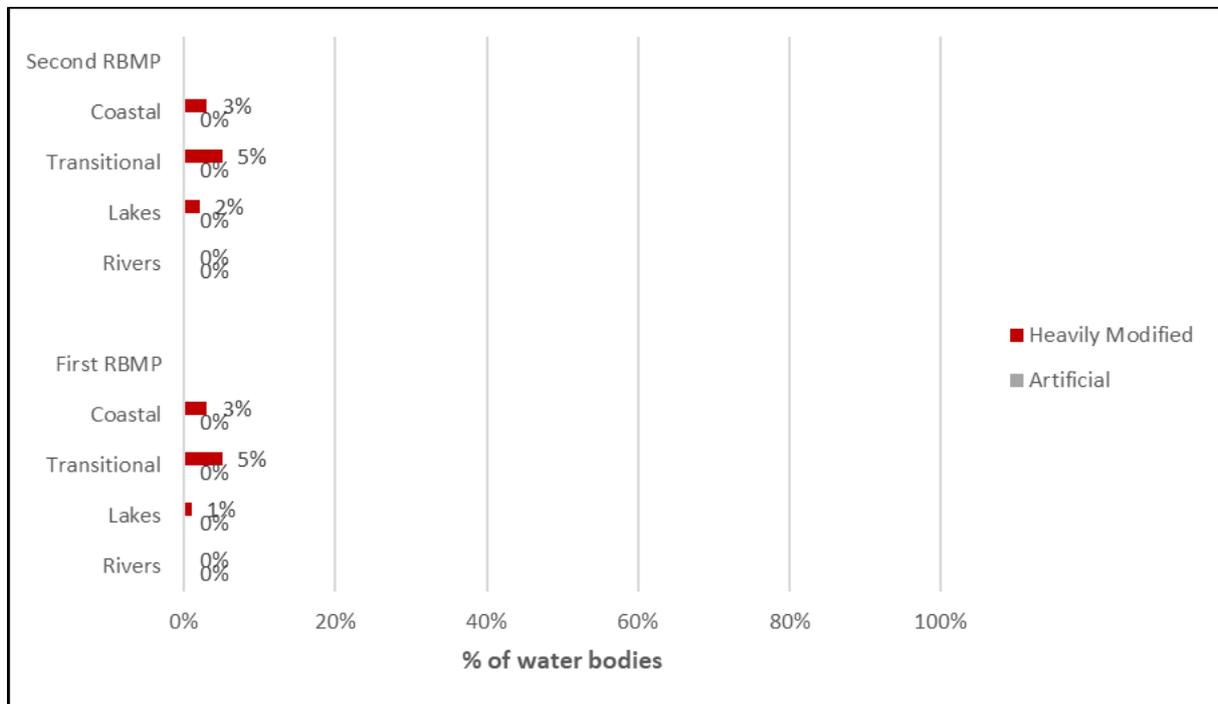
https://cdr.eionet.europa.eu/ie/eu/wfd2016/documents/national/envwtnlwq/HMWB_Identification_Guidance_2004.pdf.

⁵⁸ S.I. No. 722 of 2003.

⁵⁹ <https://circabc.europa.eu/sd/a/441e2a60-9d32-45c6-9ebb-608c7d2d15a9/GD%2004%20-%20HMWB%20-%20Policy%20Summary.pdf>.

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

The numbers in this chart are incorrect. For example, only 4 river waterbodies were designated in the 1st cycle, and the same 4 were retained for the second cycle. That represents <0.1%, not 5%.



Source: WISE electronic reports

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

In Ireland, good ecological potential is defined in all three RBDs. The Prague Approach, which bases the definition on the identification of mitigation measures, was used in all three RBDs at the waterbody level to define good ecological potential. Good ecological potential was reported to be defined in terms of biology for all three RBDs, and biological values were derived.

Some biological quality elements assessment methods in use for river, coastal and transitional waters are reported as sensitive to hydrological and morphological changes in the three RBDs in Ireland. This concerns methods for assessing fish (river and transitional) and angiosperms (coastal and transitional).

Several mitigation measures (fish ladders, habitat restoration, building spawning and breeding areas, setting of ecological flows, operational modifications for hydro-peaking, and restoration of modified bed structure) have been reported for all three RBDs.

7.2 Main changes in implementation and compliance since the first cycle

There has been a slight increase in the number of water bodies designated as heavily modified or artificial water bodies from the 26 in the first cycle to 33 in the second cycle. All 33 water bodies designated in the second cycle are designated as heavily modified water bodies and there are no artificial water bodies.

In the first cycle the methodology for setting good ecological potential, based on CIS guidance no 4, entailed a combination of a reference-based approach and the mitigation measures approach; whereas in the second cycle the Prague approach was used. The assessment of mitigation measures was used as an alternative approach for hydromorphological classification. Hydromorphological class was combined with the physico-chemical and biological class for the water body to determine the final ecological potential class for the heavily modified water body. A similar approach was adopted for the second cycle. The basis of heavily modified and artificial water bodies will be reviewed by the Environmental Protection Agency during the second cycle to take account of improved hydromorphological assessment methods.

7.3 Progress with Commission recommendations

There were no recommendation from the first RBMPs for this topic.

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 surface water bodies (good ecological status and good chemical status by 2015⁶⁰), for heavily modified water bodies (good ecological potential and good chemical status by 2015), groundwater bodies (good chemical and quantitative status by 2015) and for Protected Areas (achievement of the objectives of the associated Directive by 2015 unless otherwise specified).

In Ireland, environmental objectives for surface water ecological status have been set/reported for 3,244 water bodies and are unknown for 1,066 water bodies. Environmental objectives for surface water chemical status have been set/reported for 4,310 water bodies. All groundwater bodies have reported environmental objectives for both chemical and quantitative status. Information on when the objectives will be achieved has been reported for all water bodies in Ireland.

Assessments of the current status of surface and groundwater bodies in Ireland are provided elsewhere in this report: ecological status/potential of surface water bodies (Chapter 3); chemical status of surface water bodies (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 cycle plans, Member States are required to report the date by when they expect each surface and groundwater body to meet its environmental objective. This information is summarised for Ireland elsewhere in this report: for ecological status/potential of surface water bodies (Chapter 3); chemical status of surface water bodies (Chapter 4); quantitative status of groundwater bodies (Chapter 5); chemical status of groundwater bodies (Chapter 6).

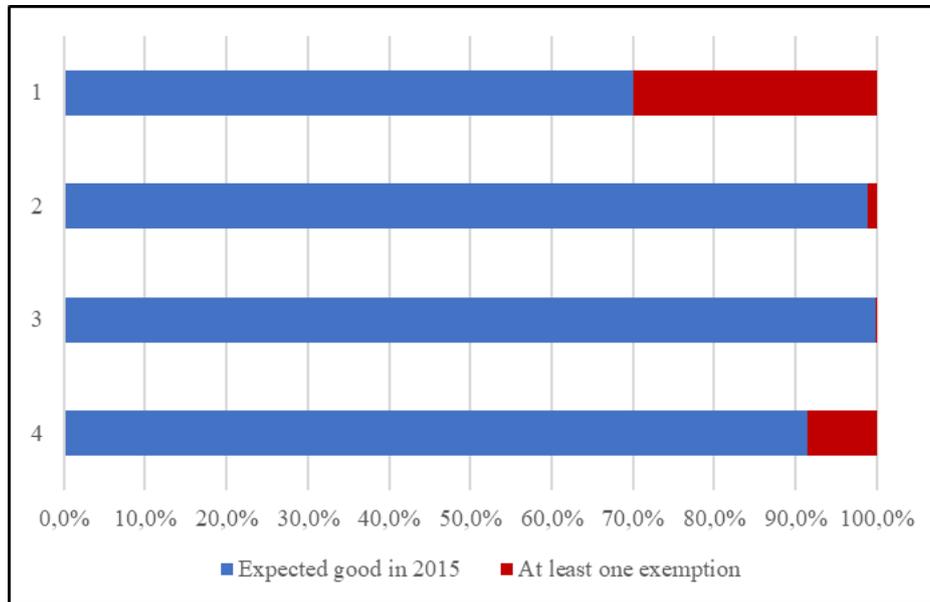
8.1.2 Exemptions

Where environmental objectives are not yet achieved exemptions 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 Ireland for the four main sets of environmental objectives.

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

Figure 8.1 Water bodies in Ireland 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



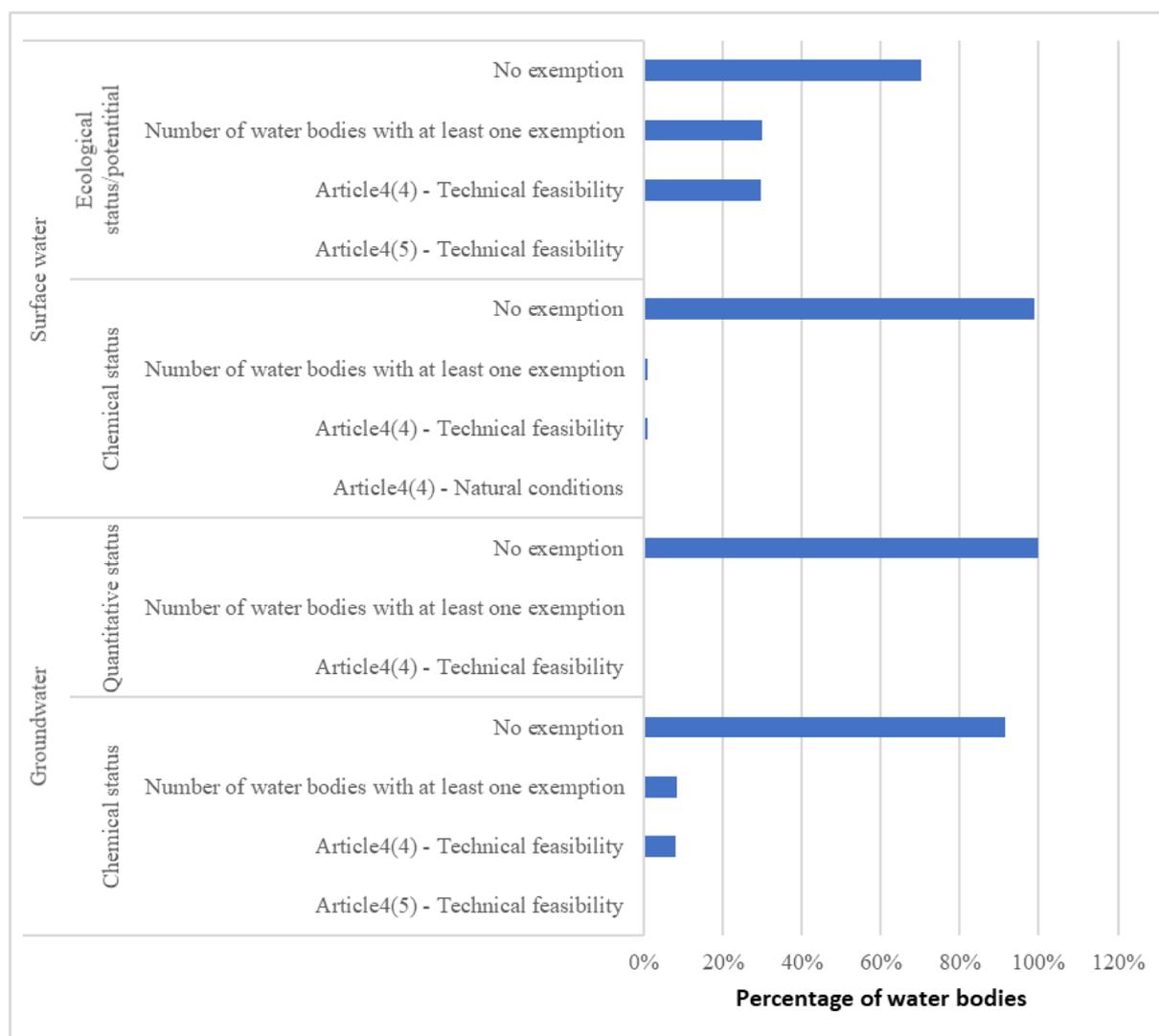
Source: WISE electronic reports. For some water bodies the date for achievement of good status is unknown.

Article 4 of the WFD allows under certain conditions for different exemptions to the objectives. The exemptions under WFD Article 4 include the provisions in Article 4(4) - extension of deadline beyond 2015, 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 allows Member States to exempt inputs of pollutants to groundwater under certain specified circumstances.

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

Figure 8.2 Type of exemptions reported to be applied to surface water and groundwater bodies for the second RBMP in Ireland. 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 reports

Application of Article 4(4)

In the second RBMP technical feasibility was the main type of justification for exemptions under Article 4(4), whereas in the first RBMP a combination of technical feasibility and natural conditions were identified. With regard to the number of water bodies where Article 4(4) exemptions was applied, a total of 1,426 (1,374 surface water and 49 groundwater) exemptions were reported in the second RBMP, compared to 1,690 (1,578 surface water and 112 groundwater) during the first RBMP.

Table 8.1 and Table 8.2 provide an overview of the drivers and pressures on surface and groundwater bodies for which exemptions have been applied. Significant drivers and pressures impacting on water bodies in Ireland include agriculture (diffuse pollution), industry

(point source pollution), domestic and urban waste disposal (point source pollution), mining (diffuse pollution), agriculture (diffuse pollution) and anthropogenic pressures.

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

Significant pressure on surface water bodies	Number of Failing Priority substances	Number of Article4(4) - Technical feasibility	Number of Article4(5) - Technical feasibility
	Number	Number	Number
2.10 - Diffuse - Other	3	2	0
2.8 - Diffuse - Mining	1	1	0
8 - Anthropogenic pressure - Unknown	4	37	0

Source: WISE electronic reports

Table 8.2 Pressure responsible for pollutants in Ireland 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				
		Article4(4) - Technical feasibility	Article4(4) - Disproportionate cost	Article4(4) - Natural conditions	Article4(5) - Technical feasibility	Article4(5) - Disproportionate cost
1.3 - Point - IED plants	11	25	0	0	0	0
1.5 - Point - Contaminated sites or abandoned industrial sites	4	5	0	0	5	0
1.6 - Point - Waste disposal sites	1	13	0	0	0	0
2.2 - Diffuse - Agricultural	2	7	0	0	0	0
2.3 - Diffuse - Forestry	1	1	0	0	0	0

Source: WISE electronic reports

Application of Article 4(5)

Article 4(5) was applied in Ireland to a total of six surface water bodies, and 5 groundwater bodies on the basis of technical feasibility. This marks a change from the first RBMP where no surface water bodies were designated under Article 4(5), and only one groundwater body was designated.

The main driver and pressure causing exemptions under Article 4(5) is identified as point source pollution from contaminated sites or abandoned industrial sites.

Application of Article 4(6)

No exemptions under Article 4(6) were applied in Ireland either in the first RBMP nor the second RBMP.

Application of Article 4(7)

No exemptions under Article 4(7) were applied in Ireland either in the first RBMP nor the second RBMP.

Application of Article 6(3) of the GWD

No exemptions under Article 6(3) were applied in Ireland either in the first RBMP nor the second RBMP

8.2 Main changes in implementation and compliance since the first cycle

A slight reduction in the number of exemptions under Article 4(4) has been achieved, from 1,690 in the first RBMP to 1,426 in the second RBMP. However, exemptions under Article 4(5) have increased from 1 in the first cycle to 11 in the second cycle. Point source pollution from contaminated or abandoned sites has been identified as the main pressure for these exemptions. In both the first and second cycles no exemptions were applied under Article 4(6) and (7) of the WFD, nor under Article 6(3) of the GWD.

8.3 Progress with Commission recommendations

The Commission recommendations based on the first RBMPs and PoM requested action on the following:

- Recommendation: *Ireland needs to provide more transparency in the RBMPs on the assessment of environmental objectives and exemptions. A large number of exemptions have been applied in this first cycle of RBMPs. While the WFD does provide for exemptions, there are specific criteria that must be fulfilled for their use to be justified. The application of exemptions needs to be more transparent and the reasons for the exemptions should be clearly justified in the plans. Ireland should take all necessary measures to bring down the number of exemptions for the next cycle, including the needed improvements in the characterisation process, monitoring networks and status assessment methods, as well as reducing significantly the degree of uncertainties.*

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 of 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: There has been a slight reduction in exemptions from the first cycle to the second cycle. However, there remains a large number of exemptions, i.e. 1,426 under Article 4(4), and exemptions under Article 4(5) have increased from 1 to 11. ‘Technical feasibility’ was identified as the main reason for exemptions. Additional reasons for justifying exemptions are set out in a document that supports the second RBMP.⁶¹

⁶¹ EPA Catchments Unit, *Approach to Applying Exemptions under Article 4 – WFD River Basin Management Plan – 2nd Cycle, May 2018.*

No exemptions under Article 4(7) were used in the second cycle.

This recommendation is therefore partially fulfilled.

Topic 9 Programme of measures

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

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

A Key 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 Type 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 KTM 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.

In Ireland, significant pressures are considered to be causing failure of good status for groundwater and surface waters in all three RBDs.

Significant drivers and pressure types that are causing failure of environmental objectives in Ireland include agriculture and domestic waste-water systems (pressures from rural diffuse and point sources); urban waste-water and runoff (pressures from urban waste-water and urban runoff); forestry (pressures from inappropriately sited forests and poorly managed forest operations); extractive industry (pressures from the harvesting of peat); invasive species; physical modifications; abstractions/diversions; and other pressures (water and land-use planning, assessment and management of flood risks, climate change adaptation, national lead strategy for drinking water, and hazardous chemicals in the aquatic environment).

The same 29 Key Type of Measures for significant pressures have been reported for surface waters in all three RBDs in Ireland. These pressures concern point and diffuse pollution from urban waste water, IED and non-IED plants, urban runoff, forestry and discharged not connected to the sewerage network, as well as abstraction or flow diversion for public water supply, physical alterations for flood protection and agriculture, dams, barriers and locks, introduced species and diseases, and anthropogenic pressures. 18 Key Type of Measures are identified for groundwater bodies in all three RBDs. Pressures/substances concern point and diffuse pollution (from agriculture, forestry, IED plants, contaminated sites or abandoned industrial sites, waste disposal sites and discharges not connected to sewerage network), as well as hydrological alteration, phosphate, ammonium, MTBE, aluminium, arsenic, zinc, phosphorus, BTEX and petroleum hydrocarbons. The Key Type of Measures adopted for groundwater bodies have included reducing nutrient pollution from agriculture (KTM 2), remediation of contaminated sites (KTM4), improving hydromorphological conditions (KTM 6), and upgrades or improvements of industrial wastewater treatment plants (KTM16).

In terms of domestic wastewater treatment, Ireland plans to seek to improve treatment systems, with over 4,000 inspections to be carried by local authorities during the period 2018 – 2021; and the domestic waste-water grant scheme will be extended to strengthen its uptake in sensitive areas.

Principal measures related to KTM1 to tackle urban wastewater and urban runoff, including €1.7 billion investment by Irish Water in waste-water projects, programmes and asset management; drainage area plans for wastewater collection systems to be completed for 44 urban areas by 2021; €12 million funding targeted at smaller plants causing significant pressures (2017-2021); continued role for the Environmental Protection Agency in the authorisation and regulation of wastewater discharges from urban areas; a review of urban wastewater discharge licences by the Environmental Protection Agency in light of an improved evidence base; Irish Water to develop a wastewater compliance strategy by 2018 to ensure compliance with the Urban Waste Water Treatment Directive.

In relation to Forestry and KTM22 the following measures are included in the second RBMP: the implementation of forestry related regulations, policies and requirements that are being realigned with national water policy; a refinement of Coillte's (owner of 50% forested lands in Ireland) Environmental Risk Assessment; promotion and uptake of the National Woodland Establishment Scheme and Native Woodland Conversation Scheme; the development of a proposed Plan for addressing protection of Freshwater Pearl Mussel populations from forestry pressures; and continue to undertake forestry and water research to inform future forestry practices.

For surface waters the same 8 substances are identified as causing failure of good status in surface waters within each of the RBDs, including isoproturon, cadmium, hexachlorobutadiene, lead, mercury and nickel. In relation to groundwater, the same five substances are identified as causing failure of good status in groundwaters, namely tetrachloroethylene, lead, mercury, dichloromethane and trichloroethylene.

In terms of indicator gaps to achieving good status for significant pressures on groundwater and surface waters, Ireland identified gaps in the number of 'At Risk' water bodies with either invasive species or anthropogenic pressure for the years 2015 and 2027.

As a result of the PoM for the second cycle, the majority of water bodies are expected to achieve good status/ potential by 2027. In terms of surface water, a small percentage (0-10%) are expected to fail to reach good status/ potential by 2027 as a result of diffuse pollution, lead and cadmium. For groundwater, contaminated sites or abandoned industrial sites, as well as lead and cadmium are expected to result of 0-10% of groundwater bodies failed to achieve good status/ potential by 2027.

In Ireland 63 basic and 57 supplementary measures are mapped against KTM. Most basic measures each represent 4.8% of those adopted, with four Key Type Measures (upgrades or improvements of industrial wastewater plants (KTM 16), reduce nutrient pollution from agriculture (KTM 2), measures to prevent or control the input of pollution from urban areas, transport and built infrastructure (KTM 21), and improving hydromorphological conditions (KTM 6), each represent 9.5%. Advisory services for agriculture (KTM 12), measures to prevent or control the adverse impacts of fishing and other exploitation/ removal of plants (KTM 20), improving longitudinal continuity (KTM 6), and water efficiency, technical measures for irrigation, industry, energy and households (KTM 8), each constitute 10.5% of supplementary measures, with the remaining supplementary measures each representing 5.3%.

No cost effectiveness measures were reported in the second RBMP.

For the first RBMP the Water Services Investment Programme provided an estimated €2.8bn of project funding, and through the Good Agricultural Practice Regulations a further €1bn has been invested in upgrading storage capacity.

The total investment for Article 11(3)a requirements in all three RBDs is reported as €5.6 billion. Investments in measures required by Articles 11(3)b-1, 11(4) and 11(5) (all other measures) were €530 million. Annual operation and maintenance costs for all three RBDs in relation to Article 11(3)a requirements is €67.25 million, and €10 m for annual operational and maintenance in all RBDs to satisfy the requirements under Articles 11(3)b-1, 11(4) and 11(5). Ireland reported that finance has been secured across a range of relevant sectors, including agriculture.

Coordination with the Marine Strategy Framework Directive took place for all three RBDs in Ireland. 23 Key Type Measures relevant to the Marine Strategy Framework Directive were listed for each RBD.

In relation to the Floods Directive, Flood Risk Management Plans have not been integrated with RBMPs. Specific win-win measures, in terms of achieving the objectives of both the WFD and the Floods Directive, drought management and the use of National Water Retention Measures have been identified in all three RBDs; and financial commitments have been secured for the implementation of the PoM in the flood protection sectors for all three RBDs. Article 9(4) of the WFD has not been applied to impoundment for flood protection in any of the RBDs in Ireland.⁶²

⁶² Ireland subsequently informed the Commission that in relation to impoundments and Article 9(4), Ireland would not typically impound water in a permanent reservoir for flood risk management purposes. There are a few examples of upstream flood water retention measures, but these are undershot embankments that only store extreme excess flows and do not interfere with the day-to-day flow regime. Flood protection structures that

9.1.2 Measures related to other significant pressures

Introduced species and anthropogenic pressures (‘other’ and ‘unknown’) have been reported for surface water bodies in all three RBDs for the years 2015 and 2021.

9.1.3 Mapping of national measures to Key Types of Measure

It was expected that Member States would be able to report their PoM 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-1)) 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 Ireland. The number of RBDs for which the Key Type of Measure has been reported is also shown. 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 Ireland

Key Type of Measure	National basic measures	National supplementary measures	Number of RBDs where reported
KTM1 - Construction or upgrades of wastewater treatment plants	3		3
KTM10 - Water pricing policy measures for the implementation of the recovery of cost of water services from industry	3		3
KTM11 - Water pricing policy measures for the implementation of the recovery of cost of water services from agriculture	3		3
KTM12 - Advisory services for agriculture	3	6	3
KTM13 - Drinking water protection measures (e.g. establishment of safeguard zones, buffer zones etc)	3		3
KTM14 - Research, improvement of knowledge base reducing uncertainty		3	3
KTM15 - Measures for the phasing-out of emissions, discharges and losses of Priority Hazardous Substances or for the reduction of emissions, discharges and losses of Priority Substances	3		3
KTM16 - Upgrades or improvements of industrial wastewater treatment plants (including farms).	6		3
KTM17 - Measures to reduce sediment from soil erosion and surface run-off		3	3
KTM18 - Measures to prevent or control the adverse impacts of invasive alien species and introduced diseases	3	3	3
KTM2 - Reduce nutrient pollution from agriculture	6	3	3
KTM20 - Measures to prevent or control the adverse impacts of fishing and other exploitation/removal of animal and plants	3	6	3
KTM21 - Measures to prevent or control the input of pollution from urban areas, transport and built infrastructure	3		3
KTM22 - Measures to prevent or control the input of pollution from forestry	6	3	3
KTM23 - Natural water retention measures		3	3

protect urban areas on the floodplains as impoundments, rather than interrupt the longitudinal flow, are also only used in extreme flows and the areas they protect are urban areas, rather than natural floodplains.

Key Type of Measure	National basic measures	National supplementary measures	Number of RBDs where reported
KTM24 - Adaptation to climate change		3	3
KTM25 - Measures to counteract acidification		3	3
KTM3 - Reduce pesticides pollution from agriculture.	3		3
KTM4 - Remediation of contaminated sites (historical pollution including sediments, groundwater, soil)		3	3
KTM5 - Improving longitudinal continuity (e.g. establishing fish passes, demolishing old dams)		6	3
KTM6 - Improving hydromorphological conditions of water bodies other than longitudinal continuity	6	3	3
KTM7 - Improvements in flow regime and/or establishment of ecological flows	3		3
KTM8 - Water efficiency, technical measures for irrigation, industry, energy and households		6	3
KTM9 - Water pricing policy measures for the implementation of the recovery of cost of water services from households	3		3
KTM99 - Other key type measure reported under PoM	3	3	3
Total number of Mapped Measures	63	57	75

Source: WISE Electronic reports

Table 9.2 Type of basic measures mapped to Key Type of Measures in Ireland

KeyTypeMeasure	Basic Measure Type									
KTM1 - Construction or upgrades of wastewater treatment plants										3
KTM10 - Water pricing policy measures for the implementation of the recovery of cost of water services from industry		3								
KTM11 - Water pricing policy measures for the implementation of the recovery of cost of water services from agriculture		3								
KTM12 - Advisory services for agriculture								3		
KTM13 - Drinking water protection measures (e.g. establishment of safeguard zones, buffer zones etc)									3	
KTM15 - Measures for the phasing-out of emissions, discharges and losses of Priority Hazardous Substances or for the reduction of emissions, discharges and losses of Priority Substances						3				
KTM16 - Upgrades or improvements of industrial wastewater treatment plants (including farms).				3	3					
KTM18 - Measures to prevent or control the adverse impacts of invasive alien species and introduced diseases			3							
KTM2 - Reduce nutrient pollution from agriculture						3	3			
KTM20 - Measures to prevent or control the adverse impacts of fishing and other exploitation/removal of animal and plants						3				
KTM21 - Measures to prevent or control the input of pollution from urban areas, transport and built infrastructure										3
KTM22 - Measures to prevent or control the input of pollution from forestry			3					3		
KTM3 - Reduce pesticides pollution from agriculture.									3	
KTM6 - Improving hydromorphological conditions of water bodies other than longitudinal continuity				3	3					
KTM7 - Improvements in flow regime and/or establishment of ecological flows	3									
KTM9 - Water pricing policy measures for the implementation of the recovery of cost of water		3								

services from households										
KTM99 - Other key type measure reported under PoM							3			

Source: WISE Electronic reports

Key

'Accidental pollution' = Article 11(3)(l): Any measures required to prevent significant losses of pollutants from technical installations and to prevent and/or reduce the impact of accidental pollution incidents.
'Controls water abstraction' = Article 11(3)(e): Controls over the abstraction of fresh surface water and groundwater and impoundment of fresh surface waters including a register or registers of water abstractions and a requirement for prior authorisation of abstraction and impoundment.
'Cost recovery water services' = Article 11(3)(b): Measures for the recovery of cost of water services (Article 9).
'Efficient water use' = Article 11(3)(c): Measures to promote efficient and sustainable water use.
'Habitats or Birds' = Habitats Directive (92/43/EEC) or Birds Directive (2009/147/EC)
'Hydromorphology' = Article 11(3)(i): Measures to control any other significant adverse impact on the status of water, and in particular hydromorphological impacts.
'IPPC IED' = Integrated Pollution Prevention Control Directive (96/61/EC) and the Industrial Emissions Directive (2010/75/EU) .
'Nitrates' = Nitrates Directive (91/676/EEC).
'Other' = Other Directives mentioned in Part A of Annex VI of the WFD.
'Point source discharges' = Article 11(3)(g): Requirement for prior regulation of point source discharges liable to cause pollution.
'Pollutants diffuse' = Article 11(3)(h): Measures to prevent or control the input of pollutants from diffuse sources liable to cause pollution.
'Pollutants direct groundwater' = Article 11(3)(j): Prohibition of direct discharge of pollutants into groundwater.
'Protection water abstraction' = Article 11(3)(d): Measures for the protection of water abstracted for drinking water (Article 7) including those to reduce the level of purification required for the production of drinking water.
'Recharge augmentation groundwaters' = Article 11(3)(f): Controls, including a requirement for prior authorisation of artificial recharge or augmentation of groundwater bodies.
'Surface Priority Substances' = Article 11(3)(k): Measures to eliminate pollution of surface waters by Priority Substances and to reduce pollution from other substances that would otherwise prevent the achievement of the objectives laid down in Article 4.
'Urban Waste Water' = Urban Waste Water Treatment Directive (91/271/EEC).

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

Member States are required to report the gaps that need to be filled to achieve the 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.

For surface waters in each RBD, Ireland reported three indicator gaps that fall under P099 'other indicator gap', namely 'number of 'At Risk' water bodies with invasive as a significant pressure'; 'number of 'At Risk' waterbodies with Anthropogenic pressure – Other as a significant pressure', and 'Anthropogenic pressure – Unknown as a significant pressure'.

Values for the gap indicators were also provided for 2015 and 2021. The value for – 'number of 'At Risk' water bodies with invasive as a significant pressure' in each RBD is 42 for 2015 and 39 in 2021. For 'number of 'At Risk' waterbodies with Anthropogenic pressure – Other as a significant pressure', the indicator gap value for 2015 is 14 and 10 for 2021 across all three RBDs. Finally, the indicator gap value for 'Anthropogenic pressure – Unknown as a significant pressure' across all three RBDs is 88 in 2015 and 76 in 2021.

9.2 Main changes in implementation and compliance since the first cycle

Changes to the reporting requirements for Programme of Measures for the second RBMP, has resulted in an increase in Key Type Measures reported from 16 to 25. Ten of the 16 predefined Key Type Measures were previously reported by Ireland. For the second cycle, 24 of the 25 predefined Key Type Measures and one additional Key Type Measure relating to domestic wastewater treatment has been reported (KTM 99)⁶³.

9.3 Progress with Commission recommendations

The Commission recommendations based on the first RBMPs and PoM requested action on the following:

- Recommendation: *Provide greater certainty on the financing of measures in the second RBMPs cycle. This is expected to include water charges, EU and national funds. Adequate financial resources for effective planning and regulatory functions of the EPA and other authorities are further necessities to underpin cost-effective water management decisions. A wider definition of water services and a fuller recovery of costs are expected to contribute to achieving the objectives in the second RBMPs.*

Provide an improved assessment of the gap to the achievement of objectives. This should be comprehensive and identify the significant gaps that exist in terms of Ireland's under-implementation of article 11.3.a basic measures (especially for drinking water and urban waste water treatment) and identify all further measures that are necessary beyond this to allow achievement of WFD good status.

Assessment: Total investment figures are provided for the second cycle, although greater certainty is needed, as well as clear differentiation of funding via water charges, EU and national funds. There is no clarity as to whether adequate financial resources for effective planning and regulatory functions of the EPA and other authorities are in place. Cost recovery is therefore partially implemented in Ireland.

The value gaps to be filled in order to achieve WFD objectives, decreased slightly between 2015 and 2021. However, significant gaps remain.

This recommendation is therefore partially fulfilled.

⁶³ Environmental Protection Agency, 'Key Type Measures and Indicators – WFD River Basin Management Plan – second Cycle (May 2018), https://cdr.eionet.europa.eu/ie/eu/wfd2016/documents/national/envwtneaw/RBMP_Cycle2_Measures_Indicators.pdf.

Topic 10 Measures related to abstractions and water scarcity

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

10.1.1 Water exploitation and trends

In Ireland water abstraction was not reported to WISE as a significant pressure, and no water resources plans were reported to be in place. Water abstraction was also not reported as a significant pressure under the European State of the Environment Report. Also, the Water Exploitation Index was not calculated.

10.1.2 Main uses for water consumption

For all three RBDs public water supply constitutes the main cause of abstraction pressure for surface water bodies. Other sectors were not reported.

10.1.3 Measures related to abstractions and water scarcity

In all three RBDs, it is reported that basic measures (Article 11(3)(e)) are not relevant as there is no permitting regime to control water impoundment or register of impoundments. No water reuse measures are reported for Ireland. In terms of Key Type Measures reported for addressing abstraction pressures, water efficiency, technical measures for irrigation, industry, energy and households (KTM 8) is identified as relevant in all three RBDs. In 2015, nine Key Type Measures are proposed for addressing water abstraction pressures, including water efficiency, technical measures for irrigation, industry, energy and households (KTM 8), advisory services for agriculture (KTM 12), national water retention measures (KTM 23), water pricing for households, industry and agriculture (KTM 9, 10 and 11) and adaptation to climate change (KTM 24). In 2021, only two Key Type Measures (water efficiency, technical measures for irrigation, industry, energy and households (KTM 8), and advisory services for agriculture (KTM 12), are proposed.

10.2 Main changes in implementation and compliance since the first cycle

While both in the first and second cycle abstraction is a pressure on groundwater and surface waters in the three RBDs, only few numbers of water bodies are considered to be at risk from hydrological pressures and small number of groundwater bodies are considered to have poor quantitative status. The quantitative status of groundwater bodies in the second RBMP aligns closely with the first RBMP where it was reported that 99.5% of groundwater bodies were of good quantitative status, and only 4 groundwater bodies were assessed to be in poor status in Ireland. Only one groundwater body is identified as of poor quantitative status in the second RBMP.

10.3 Progress with Commission recommendations

There were no recommendations from the first RBMPs for this topic.

Topic 11 Measures related to pollution from agriculture

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

Agriculture constitutes a significant pressure in approximately 53% of the 'At Risk' water bodies due to excess nutrients, chemicals (including pesticides), and sediment loss (due to poor land management).

Pursuant to EU Council Directive 91/676/EEC concerning the protection of waters against pollution caused by Nitrates from agricultural sources (Nitrates Directive), Ireland has in place a Nitrates Action Programme (2018-2021) that includes strengthened measures focused on interception and breaking the nutrient transport pathways and on preventing sediment and nutrient losses to waters. An integrated (water quality and agriculture) whole territory approach to the enforcement of the Nitrates Action Programme is in place. In addition, Ireland has a derogation pursuant to the Nitrates Directive, which allows farmers to farm at higher stocking rates (from 170kg/ha livestock manure to 250kg/ha each year), subject to implementing stricter conditions to protect the environment. Furthermore, the Agricultural Catchments Programme was established in 2008 to monitor the environmental and economic effects of the Nitrates Action Programme. The programme runs in four-yearly phases, and involves six catchments, as well as voluntary engagement with over 300 farmers. These measures have contributed to 45% of monitored sites showing improved oxidised nitrogen trends between 2007 and 2015, and a further 53% were stable. Similarly, in 2004-2006, 6% of sites were above 25mg/l NO₃ annual average, whereas by 2012 this had fallen to 1% of sites.

For surface waters, measures to reduce pesticide pollution from agriculture (KTM 3) are in place. For instance, the Sustainable Use of Pesticides Directive has been transposed into Irish law through the Sustainable Use of Pesticides Regulations.⁶⁴ Pursuant to the regulations, compulsory registration and the training of professional users of pesticides e.g. farmers, is mandated, and buffer zones, in particular on lands surrounding drinking-water abstraction points, must be in place. To date, over 24 farmers have been trained. In relation to this, drinking water protection measures (KTM13) were reported to be in place in all three RBDs. Additionally, since December 2016 all sprayers are required to be tested and approved or use, and 4,000 sprayers have been tested in advance of that date. No gap assessment for the reduction in the number of applications of pesticides was reported for any of the RBDs in Ireland.

Environmental Impact Assessment (Agriculture) Regulations are also in force since September 2011.⁶⁵ The regulations establish an EIA screening and consent process for farmers engaged in the restructuring of rural land holdings; the commencement of use of uncultivated land or semi-natural areas for intensive agriculture; and undertaking drainage works on lands used for agriculture. Screening is compulsory when any of these activities exceed a certain threshold value, are carried out within, or may affect, a natural reserve or a natural heritage area, or may have a significant effect on the environment. 629 such

⁶⁴ SI No 155, 2012.

⁶⁵ SI No 456, 2011.

applications were received between 2009 and 2015. Where it is determined that the proposed works are likely to have a significant effect on the environment, work cannot proceed with the Department of Agriculture, Food and the Marine consent.

The ‘Agricultural Sustainability Support and Advisory Programme (ASSAP), a new collaboration between government and industry to support best practice in 190 prioritised areas for action, has been established. The programme will be implemented through the support of 30 new Advisors who will work on a one-to-one basis with farmers to bring about behavioural change through improved agricultural practices in areas which have identified pressures on water bodies. Additionally, the ‘Dairy Sustainability Initiative’, a joint industry, farmer, government forum aimed to drive the development and rollout of a targeted knowledge-transfer programme to all 18,000 dairy farms has been developed.

Basic KTM measures related to agriculture reported to WISE by Ireland include KTM1 – ‘Construction or upgrades of wastewater treatment plants’; KTM2 – ‘Reduce nutrient pollution from agriculture’; KTM 7 – ‘Improvements in flow regime and/or establishment of ecological flows’; KTM16 – ‘Upgrades or improvements of industrial wastewater treatment plants (including farms); KTM17 – ‘Measures to reduce sediment from soil erosion and surface run-off’; KTM18 - ‘Measures to prevent or control the adverse impacts of invasive alien species and introduced diseases’; KTM19 – ‘Measures to prevent or control the adverse impacts of recreation including angling; KTM 20 - ‘Measures to prevent or control the adverse impacts of fishing and other exploitation / removal of animal and plants’; and KTM99 – ‘other measures’. Supplementary KTM measures reported include KTM1 – ‘Construction or upgrades of wastewater treatment plants’; KTM 4 – ‘Remediation of contaminated sites (historical pollution including sediments, groundwater, soil)’; KTM5 – ‘Improving longitudinal continuity (e.g. establishing fish passes, demolishing old dams)’; KTM6 – ‘Improving hydromorphological conditions of water bodies other than longitudinal continuity’; KTM 9 – ‘Construction or upgrades of wastewater treatment plants’; KTM12 – ‘Advisory services for agriculture’; KTM13 – ‘Drinking water protection measures (e.g. establishment of safeguard zones, buffer zones etc); and KTM14 – ‘Research, improvement of knowledge base reducing uncertainty’.

Implementation of basic measures (Article 11(3)(h)) for the control of diffuse pollution from agriculture at source was applied, with the same rules applying to all three RBDs in Ireland. The Nitrates Action Programme is applied as a whole territory approach. The sources of funding for these measures was unknown at the time of reporting. Generally binding rules have been identified as being in place for nutrients (N and P) and pesticides,

Safeguard zones around drinking water protection areas according to the Nitrates Directive⁶⁶ have been declared, although there will be significant changes to them as a result of the second RBMP.

In Ireland, it is reported that for all RBDs, farmers have been consulted under the Public Consultation process in all RBDs (see section one).

⁶⁶ Council Directive 91/676/EEC of 12 December 1991 concerning the protection of waters against pollution caused by nitrates from agricultural sources:

<http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:31991L0676>

National measures selected for reporting cover all the pressure types identified in the second RBMP, including point and diffuse pollution from urban wastewater, IED and non-IED plants, water treatment, urban runoff, agriculture, forestry, discharges not connected to a sewerage network, waste and extractive industries (peat, quarries and mines), abstraction or flow diversion for public water supply, flood protection, the introduction of species diseases, other anthropogenic pressures and dams, barriers and locks⁶⁷. These measures have been mapped to the predefined Key Type of Measures.

European Union (Water Policy) Regulations 2014⁶⁸ amend the European Communities (Water Policy Regulations 2003⁶⁹ to make Minister, in co-ordination with the newly established Water Policy Advisory Committee, responsible for putting in place arrangements to take account of Article 9 of the WFD and in particular the polluter pays principle. The extent to which the application of the polluter pays principle in the agricultural sector has been fully implemented or not is not addressed in the second RBMP.

The allocation of Rural Development Programme funding for 2014-2020 is €4 billion, of which €2.19 billion is funded by the EU. Investments in the agricultural sector include the allocation of €100 million Rural Development Programme funding for upskilling farmers and agriculture advisers in best environmental practices; and €1.4 billion funding to promote best practice in water-quality protection across 50,000 farmers. Also, each farmer that participates in the Smart Farming Programme receives a resource efficiency study for their farm, which identifies ways to improve farm returns and enhance the environment. In 2017 the average cost saving on a farm due to this scheme was €8,700, and a 10% reduction in greenhouse gas emissions was identified. 50% of the cost savings were linked to reduced use of concentrates.

11.2 Main changes in implementation and compliance since the first cycle

In Ireland the number of Key Type Measures has increased from 16 to 25. Several Key Type Measures that have been introduced in the second cycle relate to agriculture, including advisory agriculture services (KTM 12), and upgrades or improvements of industrial wastewater treatment plants (including farms) (KTM 16).

11.3 Progress with Commission recommendations

The Commission recommendations based on the first RBMPs and PoM requested action on the following:

- Recommendation: *Agriculture is indicated as exerting a significant pressure on the water resource in all Irish RBDs. This should be translated into a clear strategy that defines the basic/mandatory measures that all farmers should adhere to and the additional*

⁶⁷ Environmental Protection Agency, 'Key Type Measures and Indicators – WFD River Basin Management Plan – second Cycle (May 2018),

https://cdr.eionet.europa.eu/ie/eu/wfd2016/documents/national/envwtneaw/RBMP_Cycle2_Measures_Indicators.pdf.

⁶⁸ S.I. No. 350 of 2014.

⁶⁹ S.I. No. 722 of 2003.

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.

Ireland has put in place quite good basic measures in the first RBMP (whole territory approach to Nitrates directive and controls on phosphate), however, it was not clear in the first RBMPs how the remaining gap can be closed. Agricultural production ambitions associated with Harvest 2020 could pose a risk to achievement of WFD objectives and appropriate safeguard measures should be added into enhanced basic measures (e.g. mandatory soil testing; controls on sediment and pesticides) and supplemented by measures to protect and restore water in the rural development and forestry programmes 2012-2021. Where the second RBMPs identify additional measures necessary for the agriculture sector, RDPs may need to be reviewed to include these.

Assessment: The significant pressures on water resources as a result of agriculture are given considerable attention within the second RBMP, as well as the principle actions that will be put in place to address these pressures. There are also clear opportunities for farmers to engage in the process through the development of the RBMP and its implementation (see section one). The technical feasibility, acceptance and funding of these measures is not easy to discern from the RBMP. This recommendation has been fulfilled to a large extent.

Topic 12 Measures related to pollution from sectors other than agriculture

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

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

Key Types of Measure relevant to non-agricultural sources of pressures causing failure of WFD objectives have been reported for all RBDs in Ireland. These Key Types of Measure reported are:

KTM1 – ‘Construction or upgrades of wastewater treatment plants’

KTM10 – ‘Water pricing policy measures for the implementation of the recovery of cost of water services from industry’

KTM13 – ‘Drinking water protection measures (e.g. establishment of safeguard zones, buffer zones etc)’

KTM14 – ‘Research, improvement of knowledge base reducing uncertainty’

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

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

KTM17 – ‘Measures to reduce sediment from soil erosion and surface run-off’

KTM18 – ‘Measures to prevent or control the adverse impacts of invasive alien species and introduced diseases’

KTM20 – ‘Measures to prevent or control the adverse impacts of fishing and other exploitation/removal of animal and plants’

KTM21 – ‘Measures to prevent or control the input of pollution from urban areas, transport and built infrastructure’

KTM22 – ‘Measures to prevent or control the input of pollution from forestry’

KTM23 – ‘Natural water retention measures’

KTM24 – ‘Adaptation to climate change’

KTM25 – ‘Measures to counteract acidification’

KTM4 – ‘Remediation of contaminated sites (historical pollution including sediments, groundwater, soil)’

KTM5 – ‘Improving longitudinal continuity (e.g. establishing fish passes, demolishing old dams)’

KTM6 – ‘Improving hydromorphological conditions of water bodies other than longitudinal continuity’

KTM7 – ‘Improvements in flow regime and/or establishment of ecological flows’

KTM8 – ‘Water efficiency, technical measures for irrigation, industry, energy and households’

KTM9 – ‘Water pricing policy measures for the implementation of the recovery of cost of water services from households’

KTM99 – ‘Other key type measure reported under PoM’

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 (see chapter 9 of this report).

In all three RBDs, both basic and supplementary measures were reported to WISE, including quantitative information (number of measures per Key Type Measure) on the basic and supplementary measures used to tackle pollution from non-agricultural sources for all RBDs. These measures totaled 136 across all three RBDs (54 basic and 82 Supplementary).

The use of a permitting regime to control wastewater point source discharges (basic measures Article 11(3)(g)) was reported for all RBDs in Ireland. However, a register of wastewater discharges was not adopted in any of the RBDs. In terms of thresholds, small discharges are exempted from controls and some direct discharges are authorised in accordance with Article 11(3)(j) of the Water Framework Directive within all three of the RBDs.

In each of the RBDs within Ireland 8 priority substances are causing failure within surface water bodies, and 17 priority substances are causing failure within groundwater bodies. A series of measures have been adopted to address surface water bodies, measures for phasing out of emissions, etc. (KTM 15) and remediation of contaminated sites (KTM 4). Additionally, measures to address groundwater bodies include the remediation of contaminated sites (KTM 4). Funding for surface water measures up to 2015 is reported at €5.4 billion and for groundwater €5.7 billion.

12.2 Main changes in implementation and compliance since the first cycle

As noted in the previous topic, in Ireland the number of Key Type Measures has increased from 16 to 25. In addition to the Key Type Measures related to agriculture, measures that have been introduced include improving longitudinal continuity (e.g. establishing fish passes, demolishing old dams (KTM 5), improving hydromorphological conditions of water bodies other than longitudinal continuity (KTM 6), improvements in flow regime and/or establishment of ecological flows (KTM 7), water efficiency, technical measures for irrigation, industry, energy and household (KTM 7), measures to reduce sediment from soil erosion and surface runoff (KTM 17), measures to prevent or control the adverse impacts of fishing and other exploitation/ removal of animal plants (KTM 20), measures to prevent or control the input of pollution from urban areas, transport and built infrastructure (KTM 21), national water retention measures (KTM 23), adaptation to climate change (KTM 24), measures to counter act acidification). It should be noted that several of these measures relate to both agriculture and non-agricultural pressures, e.g. adaptation to climate change (KTM 24).

Measures to address wastewater discharges are set out in the Wastewater Discharge (Authorisation) Regulations 2007, which gives effect to the Urban Wastewater Treatment Directive (Directive 91/271/EEC) and the WFD. Measures have not changed significantly from the first to the second cycle.⁷⁰ All discharges from sewerage systems owned, managed and operated by Water Service Authorities require a wastewater discharge licence or certification of authorisation from the Environmental Protection Agency. As of 2009, agglomerations with a population of less than 500, must apply to the Environmental Protection Agency for a certificate of authorisation for discharges of waste water.

Direct discharges to groundwater have been prohibited, with a few possible exemptions, under the European Communities Environmental Objectives (Groundwater) Regulations.⁷¹ Measures for phasing out of emissions, discharges and losses of Priority Hazardous Substances or for the reduction of emissions, discharges and losses of Priority Substances have been provided for in both the first and second cycles, which include the enforcement of discharge licenses.

12.3 Progress with European Commission recommendations

There were no recommendations from the first RBMPs for this topic.

⁷⁰ S.I. No 684 of 2007.

⁷¹ S.I. No 9 of 2010.

Topic 13 Measures related to hydromorphology

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

All three RBDs in Ireland have significant hydromorphological pressures, and each has Key Type Measures to address these hydromorphological pressures. The most frequently applied Key Type Measures to tackle hydromorphological pressures include: improvements in flow regime and/or establishment of ecological flows (KTM 7), research, improvement of knowledge base reducing uncertainty (KTM 14), measures to reduce sediment from soil erosion and surface run-off (KTM 17), natural water retention measures (KTM 23), adaptation to climate change (KTM 24), improving hydromorphological conditions of water bodies other than longitudinal continuity (KTM 6), and improving longitudinal continuity (KTM 5). The main specific sectors/ drivers that were reported to be related to these significant hydromorphological pressures include abstraction or flow diversion for public water supply, physical alterations of water bodies for flood protection and agricultural purposes, dams, barriers and locks, and anthropogenic pressures ('other' and 'unknown').

In the second RBMP, Ireland identified a series of actions to address hydromorphological pressures including continued reliance on existing regulations to ensure environmental impacts assessments mitigate the impact of planned land-use changes; the reduction of the exempted-development threshold for drainage wetlands from 20 ha. to 0.1 ha; improvement of assessment methods and knowledge of the Environmental Protection Agency, including the development of a Morphological-Quality Index for Irish rivers and enhanced use of GIS; development of the necessary evidence base for establishing the link between physical integrity of water bodies and ecological status; through leadership of Inland Fisheries Ireland, the implementation of a multi-stakeholder programme to collect and collate data, including an inventory, concerning barriers to fish migration nationally; ensuring that mitigation measures are incorporated in the Office of Public Work's drainage maintenance programme; a steering group to review and make recommendations on improving fish passage throughout the Shannon catchment to be established by the Minister of Housing, Planning and Local Government; and a series of Environmental Protection Agency research projects related to hydromorphology will be completed and their outputs used to inform future actions to mitigate the impact of hydromorphological impacts.

No basic measures according to WFD Article 11(3)(j) were reported to be implemented by Ireland, nor were any overall management objectives and quantitative objectives in terms of river continuity.

Win-win measures to achieve the objectives of the WFD and the Floods Directive, drought management and the use of Natural Water Retention Measures were reported for all three RBDs in Ireland. Additionally, ecological flows have been derived for some relevant water bodies in all of the three RBDs within Ireland, but work is underway to ensure that ecological flows are fully implemented.

Indicators on the gap to be filled for hydromorphological pressures were reported for 2015 and 2021 for all three RBDs.

13.2 Main changes in implementation and compliance in the first cycle

No data were reported under the first cycle in the database and it is not possible to assess the changes in implementation and compliance in the first cycle.

13.3 Progress with European Commission recommendations

The Commission recommendations based on the first RBMPs and PoM requested action on the following:

- Recommendation: *Complete the review of the legislative framework to improve the management of abstractions and to address morphological impacts. Ireland should make measures operational in the second RBMPs. Address existing gaps in the legislative framework (abstraction and morphological controls) for the correct implementation of the WFD to ensure all basic measures are in place with a legal basis in the second RBMPs.*

Ensure that orphan hydromorphological modifications (i.e. no clear user/responsibility) are addressed through a restoration programme which is adequately funded.

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

Ensure effective coordination between the WFD and FD, especially in the identification and prioritization of natural water retention measures that can deliver cost effective outcomes for both. Funding for such measures should be prioritised from EU (e.g. agriculture, forestry) and national funds.

Characterize better impacts arising from water abstractions. There is not enough information relating hydromorphological measures to pressures and the linkages between the measures and their expected effects are not indicated in the plans.

Assessment: Ireland has now adopted a register of water abstractions in accordance with European Union (Water Policy) (Abstractions Registration) Regulations 2018.⁷² In the second cycle much of the focus in relation to hydromorphology will be on improving knowledge of hydromorphology-ecology relationships, the development of assessment tools, and the assessment of hydromorphological conditions. However, activities such as, developing key indicators and agreement a monitoring programme, identifying appropriate measures, developing prioritised restoration programme, developing environmental quality standards, and adapting tools for assessing impacts of proposed developments, while developed in the second cycle, are not likely to be implemented until the third cycle.

⁷² S.I. No. 261, 2018.

Therefore this recommendation has been partially fulfilled.

Topic 14 Economic analysis and water pricing policies

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

In Ireland, commercial users of water have since 1998, pursuant to the Government's National Water Pricing Policy, been charged for the provision of water and wastewater services. Plans are underway for Irish Water to establish a Non-Domestic Tariff Framework for water and wastewater service provision, which will address the issues of having multiple tariff levels, categories, billing methods, billing arrangements and billing cycles. The new framework aims to provide a fairer and more standardised system for non-domestic charging. Following a consultative process and the adoption of the Water Services Act 2017, it has been agreed that up to a certain threshold amount (213,000 litres per dwelling per annum), water costs to domestic users will be met through central government funding. Through automated reading technology, customers that use water above this threshold will be charged for that excess amount.

Economic Analysis was not updated in any of the RBDs.

As noted above, since 1998 the government's National Water Pricing Policy has been to charge non-domestic customers the 'full costs' of providing water and waste-water services. However, while plans are underway to establish the aforementioned non-domestic tariff framework and to introduce threshold limits for domestic uses, the current system does not fully align with the polluter-pays principle, due to the wide range of non-domestic tariff levels, categories and methodologies used. In addition, non-domestic water and wastewater charges have held constant at the level charged by local authorities as of 31 December 2013. However, this does not square with increased investment in the provision of water and wastewater services to customers by Irish Water from October 2014 to end of 2019.

It was highlighted in the first cycle, that Ireland adopts a narrow approach to water services, and that this would be amended to align with the Commission's definition of water services, including households, industry and agriculture. It was further noted that cost recovery is only adequate for industrial uses, and the contribution from households is effectively zero. While steps have been taken to change water pricing policy in Ireland, these measures have not yet been adopted, and may not go far enough in terms of full cost recovery and the polluter pays principle.

14.2 Progress with European Commission recommendation

The Commission recommendations based on the first RBMPs and PoM requested action on the following:

- Recommendation: *The cost-recovery should address a broad range of water services, including impoundments, abstraction, storage, treatment and distribution of surface waters, and collection, treatment and discharge of waste water, also when they are "self-services", for instance self-abstraction for agriculture to collection and discharge of waste water, from scattered settlements, for which for instance environmental and resource costs also need to be recovered. The cost recovery should be transparently presented for*

all relevant user sectors, at least broken down into industry, households and agriculture, and environment and resource costs should be included in the costs recovered. Information should also be provided on the incentive function of water pricing for all water services, with the aim of ensuring an efficient use of water. Information on how the polluter pays principle has been taken into account should be provided in the RBMPs.

Assessment: Addressing the Commission's recommendations will be contingent on the new framework for non-domestic users, and pricing policy for domestic users being in place. No explicit information on how the polluter pays principle has been taken into account is provided in the second RBMP. Therefore, this recommendation has been partially 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

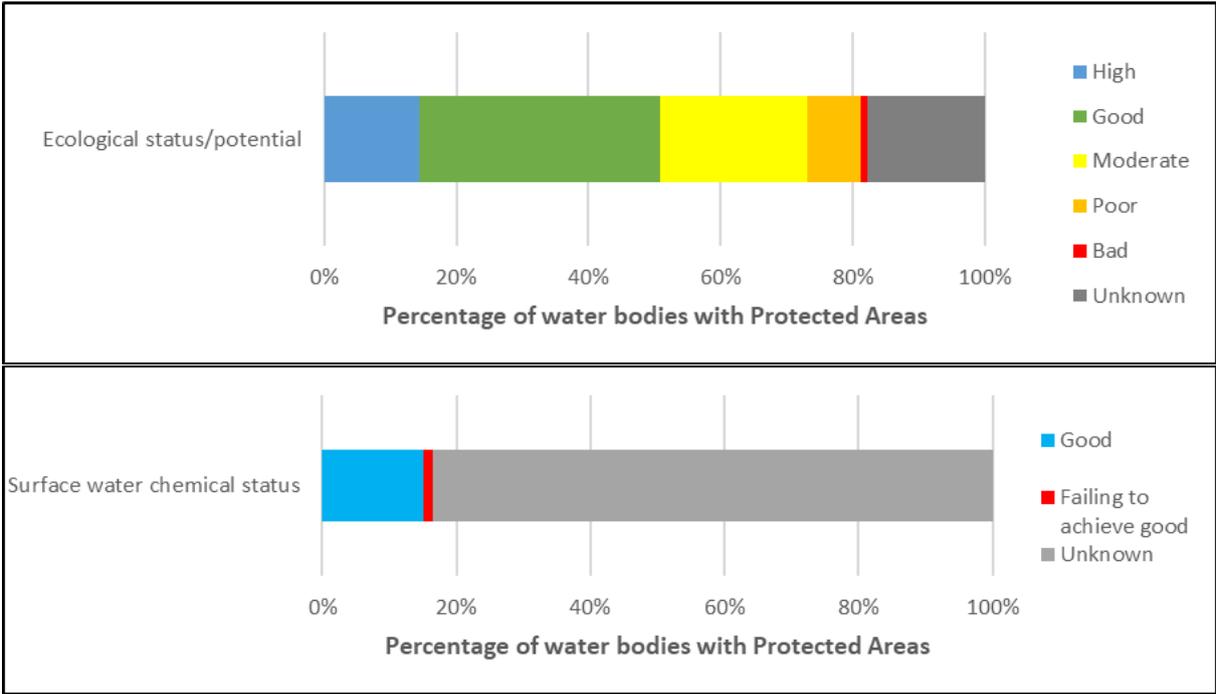
As illustrated in table 15.1, in Ireland Protected Areas were designated for drinking water, bathing waters, wastewater treatment, fish and shellfish waters, and habitats and species.

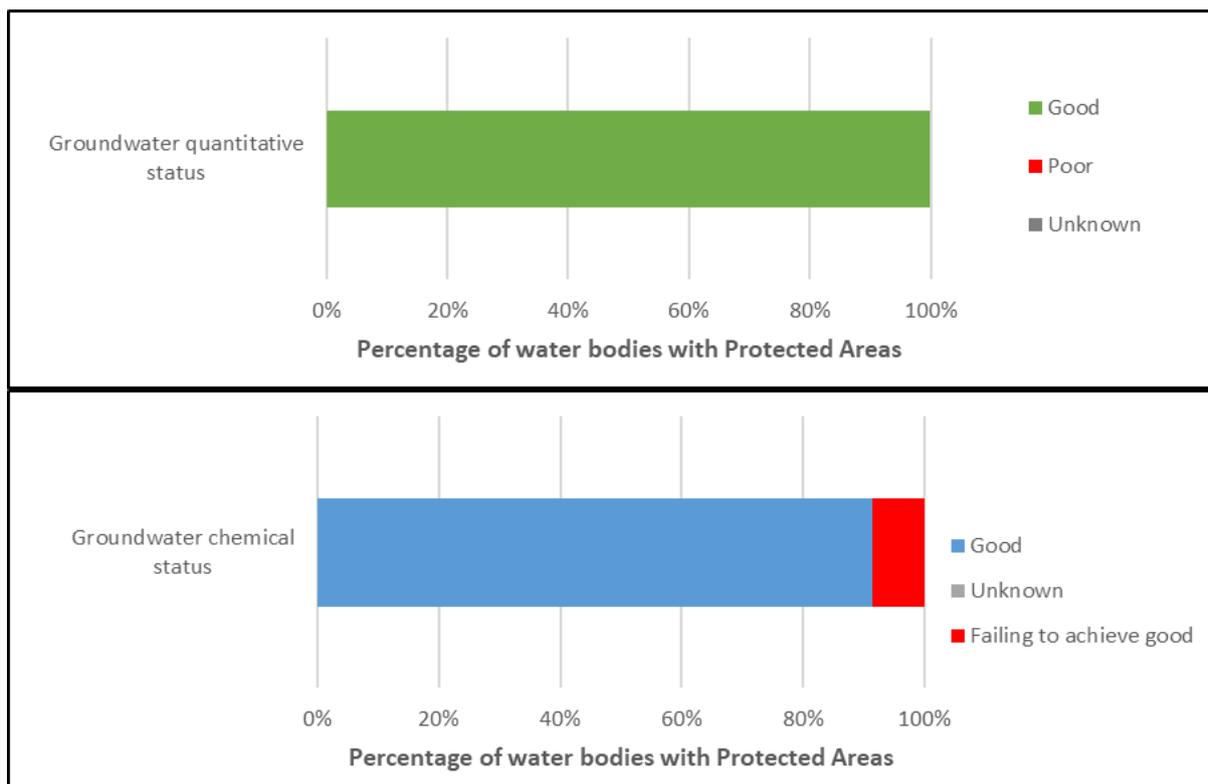
Table 15.1 Number of Protected Areas of all types in each RBD of Ireland, for surface and groundwater

Protected Area Type	Number of Protected Areas associated with				
	Rivers	Lakes	Transitional	Coastal	Groundwater
Article 7 Abstraction for drinking water	250	102	1	0	513
Bathing	0	9	6	115	0
Fish	34	0	5	0	0
Habitats	9	0	0	0	36
Shellfish	0	0	31	56	0
Urban Wastewater Treatment Directive Sensitive Area	54	11	25	10	0

Source: WISE Electronic reports

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





Source: WISE electronic reports

In Ireland, 430 candidate Special Areas of Conservation (SACs), have been identified, 358 (85%) of which contain at least one water-dependent feature.⁷³ Protected water-dependent habitats are present in 825 river water bodies, 214 lakes, 128 transitional water bodies and 80 coastal water bodies. It is estimated that water-supporting conditions for protected water-dependent habitats and species are not being met in 153 river water bodies, 31 lakes and 11 transitional waters. However, there are a further 39 river water bodies, 55 lakes, 18 transitional water bodies and 8 groundwater bodies where the water-supporting conditions for protected water-dependent habitats and species are known, but the bodies are not monitored. Further monitoring of these bodies is therefore required to ascertain whether their objectives have been met.

The second RBMP reveals that with regard to drinking water following treatment, over 99% of samples complied with microbiological and chemical standards. For the purposes of identifying 'At Risk' drinking water protected areas, levels of pesticides and nitrates were assessed. This revealed that in 2016, 44 of out 904 public water supplies failed to meet the pesticides standards, and two supplies failed to meet the nitrate standard under EU (Drinking Water) Regulation 2014.

In Ireland, 87 areas have been designated as shellfish waters⁷⁴. For the period 2009-2015, the overall dissolved concentrations for metals in these areas complied with environmental quality standards. With respect to microbiological quality, overall achievement of the guide E.

⁷³ Special Areas of Conservation are selected and designated pursuant to the EU Habitats Directive, which was transposed into Irish Law by S.I. No. 477 of 2011.

⁷⁴ S.I. No 268 of 2006, S.I. No 55 of 2009, S.I. 464 of 2009.

Coli value was relatively stable for the period 2009-2015. Areas that most frequently failed to meet the guide value were Adrigole Harbour, Bannow Bay, Bantry, Cork North Channel, Comane, Dweedore Bay, Kinsale, Loughras beg, Tralee bay and Wexford Harbour (inner and outer). In these areas, urban wastewater discharges are being assessed to determine whether they contribute to the failures, and whether more stringent waste-water treatment measures may be needed.

Table 15.2 provides an overview of the monitoring of surface and groundwater associated with Protected Areas in Ireland. All water bodies except coastal have monitoring sites associated with protected areas in relation to the abstraction of water intended for human consumption. In relation to the Bathing Waters Directive 76/160/EEC there are monitoring sites in place for lakes, transitional and coastal waters only. All water bodies, except groundwater, have monitoring sites associated with Protected Areas in relation to the Urban Wastewater Treatment Directive 91/160/EEC. Monitoring sites for protected areas related to the Habitats Directive 92/43/EEC are only in place for rivers and groundwater water bodies. No monitoring sites associated with protected areas in relation to the Birds Directive 79/409/EEC are in place for any water bodies.

Further information on the purpose of monitoring sites for surface water and groundwater status assessment can be found in Chapters 3 and 4 (ecological and chemical status of surface waters) and Chapters 5 and 6 (quantitative and chemical status of groundwaters) of this report.

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

Protected Area Type	Number of monitoring sites associated with Protected Areas				
	Rivers	Lakes	Transitional	Coastal	Groundwater
Abstraction of water intended for human consumption under Article 7	250	102	1	0	513
Recreational waters, including areas designated as bathing water under Directive 76/160/EEC	0	9	6	115	0
Protection of species where the maintenance of the status of water is an important factor in their protection, including relevant Natura 2000 sites designated under Directive 79/409/EEC (Birds)	0	0	0	0	0
Protection of habitats or species where the maintenance or improvement of the status of water is an important factor in their protection, including relevant Natura 2000 sites designated under Directive 92/43/EEC (Habitats)	32	0	0	0	45
Nutrient-sensitive areas, including areas designated as vulnerable zones under Directive 91/676/EEC (Nitrates Directive) and areas designated as sensitive areas under Directive 91/271/EEC (Urban Wastewater Treatment Directive)	178	16	51	12	0
Areas designated for the protection of economically significant aquatic species	225	0	48	69	0

Source: WISE electronic reports

Safeguard zones in Drinking Water Protected areas are in place for all RBDs in Ireland, although significant changes are envisaged as a result of the second RBMP and the work

underway by Irish Water and the Environmental Protection Agency to conduct a Source Risk Assessment to identify drinking-water sources that may require safeguard zones. Irish Water plans to complete 353 Source Risk Assessment by the end of 2021.

Article 4(4) exemptions in relation to protected areas and on the basis of technical feasibility have been applied in all three RBDs.

15.2 Main changes in implementation and compliance in the first cycle

There have been some changes in the number of protected areas designated between the first and second reporting cycles. In relation to Article 7 Abstraction for Drinking Water protected areas, 943 were designated in the first cycle, which was then reduced to 866 in the second cycle. The number of protected areas under the Bathing Directive has increased from 126 to 130. Fish protected area types have increased from 31 in the first reporting cycle to 39 in the second reporting cycle. Protected areas under the Habitats Directive have witnessed a major decline from 426 in the first reporting cycle to 45 in the second cycle. Protected areas related to shellfish have increased from 63 in the first cycle to 87 in the second cycle. Finally, under the Urban Waste Water Treatment Directive, 42 protected areas were designated in the first cycle, which has increased to 80 in the second cycle.

15.3 Progress with European Commission recommendations

There were no recommendations from the first RBMPs for this topic.

Topic 16 Adaptation to drought and climate change

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

Several aspects relating to climate change were considered within all three RBDs, including flood risk management, assessing direct and indirect climate pressures, checking the effectiveness of measures, preferential selection of robust adaptation measures, and the maximisation of cross-sectoral benefits and minimisation of negative effects across sectors. Additionally, Key Type Measure 24 (Climate Change Adaptation) was also applied across all three RBDs in Ireland.

A National Adaptation Framework (NAF), which builds upon the 2012 National Climate Change Adaptation Framework, has been developed for Ireland pursuant to the Climate Action and Low Carbon Development Act 2015. NAF, which is reviewed every five years, sets out the strategy for applying adaptation measures to different sectors. Detailed adaptation measures are then developed within and across sectors, including local government. As part of NAF, the Minister of Housing, Planning and Local Government is required to prepare a specific sectoral adaptation plan in relation to water quality and water-services infrastructure. Ireland has relied upon CIS guidance document No. 24⁷⁵ in the development of its national adaptation strategies.

In relation to droughts, Irish Water is developing a National Water Resources Plan, which was published for public consultation during 2018. As part of developing this plan, Irish Water will develop a drought management plan. In the second cycle no sub-plans for water scarcity and droughts have been reported; and Article 4(6) concerning prolonged droughts has not been applied within any of the three RBDs in Ireland.

16.2 Main changes in implementation and compliance in the first cycle

Some measures related to climate change are mentioned in the first RBMP, although the incorporation of specific climate change adaptation measures was limited. More focus on climate change adaptation is evident in the second RBMP in light of the National Adaptation Framework and the introduction of adaptation to climate change (KTM 24) measures in all three RBDs. These measures have included water-resource and flood-risk management sectoral adaptation plans.

16.3 Progress with European Commission recommendations

There were no recommendations from the first RBMPs for this topic.

⁷⁵ https://ec.europa.eu/environment/water/water-framework/facts_figures/guidance_docs_en.htm