Chapter 4
Water

This chapter reviews the current status of surface waters and groundwaters in Ireland. The main drivers and pressures are identified and a prognosis on outcomes is presented with a path towards achieving the goals of the Water Framework Directive (WFD), which is now halfway through its first full implementation cycle.

In summary, the assessment of Ireland’s water resources shows that:

- 71% of river channel is at high or good status
- 46.6% of lakes monitored are at high or good status
- 46% of transitional and coastal waters are at high or good status
- 85.6% of the area of groundwater aquifers is at good status.

Water quality in Ireland compares favourably with that in other EU countries. However, similar to many other EU countries, Ireland still faces considerable challenges to meet the objectives of the WFD within the required timeframes. The three main challenges for water quality management are to eliminate serious pollution associated with point sources; to tackle diffuse pollution; and to use the full range of legislative measures in an integrated way to achieve better water quality. A key aspect is that focusing measures on rivers, where monitoring has identified particular causes of pollution, will help reduce pollutant loading to lakes and coastal waters as well as improving river quality.

In addressing these challenges, improvements are also required in the governance and administrative systems for water management in Ireland to ensure that they are optimised to support the delivery of Ireland’s obligations under the WFD and other water legislation.
Introduction

The WFD was introduced in 2000 as a European-wide law that brings a common approach to safeguarding all water and water-dependent ecosystems: groundwaters, rivers, lakes, transitional waters, coastal waters and wetlands. The main goals of WFD are:

- to maintain high- and good-status waters where they exist already
- to restore waters that do not support aquatic ecosystems adequately.

These are ambitious goals which all EU countries, including Ireland, must attain and they provide a vision and a target for the management and protection of water across the EU over the coming decades. The main unit of management for the WFD is the River Basin District (RBD), and Ireland has been divided into seven RBDs. River basin management plans for all seven RBDs were finalised in July 2010. This marked the culmination of many years of effort and significant expenditure in monitoring and assessing Ireland’s surface waters and groundwaters; classifying the waters according to their quality status; and setting objectives with a view to protecting and improving these waters in accordance with objectives of the WFD.

The Current Situation

The WFD requires surface waters to be classified into high, good, moderate, poor and bad status. Groundwater is classified according to its chemical and quantitative status. The methods for classifying surface waters have been intercalibrated in a formal exercise required by the WFD. This is in order to ensure comparability across Europe. In addition, the former assessments of Irish waters, which have been conducted since the 1970s, have now been adapted to ensure they are compliant with the needs of the WFD and comparable with methods used in other countries.

Groundwater Quality

Groundwater is important as a source of drinking water in Ireland – providing approximately 25% of drinking water nationally. It also has significance in driving the ecology of many rivers, lakes and estuaries, especially during low-flow periods when groundwater forms a significant part of surface water flows. Table 4.1 provides a summary of the status of groundwater bodies in each of the seven RBDs and nationally in terms of numbers of water bodies and area covered. It shows that the majority of Irish groundwater bodies (85%) achieve good status as required under the WFD.

The bulk of poor-status groundwater bodies, particularly in the Western and Shannon RBDs, are in areas where groundwater is contributing significant loads of phosphate to surface water bodies that are failing to meet their WFD objectives because of eutrophication from diffuse sources. A small number of water bodies are also at less than good status due to site-specific contamination, e.g. from historical mining in the Avoca catchment and at Silvermines.

Importantly, WFD criteria do not include microbiological elements in determining the assessment of ecological status. In 2010, 40% of all samples taken from the 285 wells and springs in the EPA national groundwater monitoring network were polluted by microbial pathogens, which can pose a threat to private water supplies in particular.

Table 4.1 River Basin District Summary of Status Classification Results for Groundwater Bodies (Source: EPA)

<table>
<thead>
<tr>
<th>RBD</th>
<th>Good Status (No. of water bodies)</th>
<th>Good Status (% RBD Area)</th>
<th>Poor Status (No. of water bodies)</th>
<th>Poor Status (% RBD Area)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eastern</td>
<td>67</td>
<td>89.7</td>
<td>8</td>
<td>10.3</td>
</tr>
<tr>
<td>Neagh Bann</td>
<td>26</td>
<td>95.3</td>
<td>2</td>
<td>4.7</td>
</tr>
<tr>
<td>North West</td>
<td>72</td>
<td>100</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>South East</td>
<td>146</td>
<td>97.8</td>
<td>5</td>
<td>2.2</td>
</tr>
<tr>
<td>Shannon</td>
<td>182</td>
<td>74.5</td>
<td>60</td>
<td>25.5</td>
</tr>
<tr>
<td>South West</td>
<td>77</td>
<td>96.8</td>
<td>7</td>
<td>3.2</td>
</tr>
<tr>
<td>Western</td>
<td>71</td>
<td>65.2</td>
<td>34</td>
<td>34.8</td>
</tr>
<tr>
<td>National</td>
<td>641</td>
<td>85.6</td>
<td>116</td>
<td>14.4</td>
</tr>
</tbody>
</table>
Nitrate and Phosphate in Groundwater

Figure 4.1 illustrates trends in nitrate levels. In the period 2008–2009 there was a general reduction in nitrate concentrations compared with the previous period, which has been attributed to increased rainfall, reductions in inorganic fertiliser usage, improvements in organic fertiliser storage and the implementation of land-spreading restrictions. In comparison with 2009, the slight increases in nitrate concentrations that are observed in 2010 are attributed to reduced rainfall leading to less dilution of the nutrients in the water body (McGarrigle et al., 2010).

Elevated nitrate concentration in groundwater remains an issue, particularly in the southeast and south of the country. It may contribute to eutrophication of surface waters and impact on the quality of water abstracted for drinking water. Elevated phosphate concentrations in groundwater, resulting from diffuse pressures, can also be a cause of eutrophication of rivers and lakes where the source of phosphate is not attributed to point source discharges, especially at times of low flow. Previous EPA water quality reports (1994–2010) have reported diffuse agricultural pollution as a significant source of the elevated nitrate and phosphate concentrations in Irish groundwaters.

River Water Quality

Over 13,000 km of river channel is assessed by the EPA on an ongoing basis at over 2,500 sample points. The most recent assessments show that approximately 71% of river channel is classed as unpolluted in Ireland – achieving at least good ecological status. However, approximately 29% of monitored river channel length is polluted to some degree (Figure 4.2).

Long-term trends in river quality from 1987 to 2011 are shown in Figure 4.2. The main trends show that there has been:

- an overall decrease in the length of river channel that is classed as unpolluted, although there have been some improvements in recent years

Figure 4.1 Trends in Nitrate Concentrations at Groundwater Monitoring Locations 1995–2010 (Source: EPA)

Figure 4.2 National Trends in the 13,188 km Baseline Showing the Percentage of Surveyed River Channel in the Four EPA Biological Quality Classes (Source: EPA)
Monitoring for WFD purposes commenced in 2007. Table 4.2 shows the breakdown in terms of numbers of WFD water bodies and their WFD ecological status (as opposed to channel length, shown in Figure 4.2). The overall ecological status seems lower than that based on individual sites and quality elements. This is because the final ecological status of a water body is determined by the lowest status of the available quality elements at each site, and also by the lowest status of the monitored sites within the water body – there may be more than one monitoring station within each water body. The main success story over the past eight years has been the virtual elimination of seriously polluted (bad ecological status) river sites. The focus is now on the moderate- and poor-status sites and on the point and diffuse sources that cause the pollution.

Table 4.2 River Water Quality in Ireland – Ecological Status 2007–2009 (Source: EPA)

<table>
<thead>
<tr>
<th>Ecological Status</th>
<th>Number of Water Bodies</th>
<th>% of Water Bodies</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>204</td>
<td>13</td>
</tr>
<tr>
<td>Good</td>
<td>612</td>
<td>39</td>
</tr>
<tr>
<td>Moderate</td>
<td>435</td>
<td>28</td>
</tr>
<tr>
<td>Poor</td>
<td>295</td>
<td>19</td>
</tr>
<tr>
<td>Bad</td>
<td>18</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>1,564</td>
<td></td>
</tr>
</tbody>
</table>

High-status waters such as rivers with healthy populations of freshwater pearl mussel require very high standards of protection. However, the number of such high-status waters has declined significantly in recent decades (Figure 4.3). This decline is worrying, and site-specific, targeted interventions are needed in the catchments with high-status sites to prevent further loss.

Irish river water quality can be compared directly with that of other European countries using the European Environment Agency’s Waterbase database, which has a representative set of nutrient monitoring stations across Europe. Ireland’s ranking for biochemical oxygen demand (BOD), ammonia,
phosphate and nitrate is shown in Figure 4.4. This is based on a comparison of the reported concentrations in rivers across Europe in the period 2007–2009. Ireland’s water quality compares very favourably with that of other EU countries, typically ranking in the top third of the 30+ assessed. However, there is no room for complacency as Ireland faces significant challenges in meeting the requirements of the WFD within the specified timeframes. These are the same as in most other EU countries. Pollution from nutrients and organic matter arising from sewage, agriculture and industrial sources is still the most common form of pollution across Europe. The WFD programmes of measures to address these sources are discussed further later.
Canal Water Quality

The main canal systems (the Royal and Grand Canals) and sections of the Shannon-Erne Waterway have been identified as artificial water bodies (AWBs) under the Water Framework Directive (WFD). They are required to achieve good ecological potential rather than ecological status. Ecological potential means that the water body is managed to achieve the biology that can be attained given its artificial nature. For classification purposes, the ecological potential can be maximum, good, moderate, poor or bad. The interim classification of ecological potential for Irish canals, based on chemical, biological and hydromorphological criteria, showed that 87% of the 332 km surveyed was at good ecological potential (Waterways Ireland and Central Fisheries Board, 2008).

Water-quality monitoring over the period 2007–2009 indicated generally good conditions in the Royal and Grand Canal systems and in the canalised section of the Shannon-Erne Waterway (Central Fisheries Board, 2008 and 2009). In 2010 and 2011 quality remained generally in good condition.

Lake Water Quality

In the period 2008–2010, ecological status was assigned to 208 lakes by the EPA, representing 981 km² of lake surface water covering 65% of the total lake surface area in Ireland (see Table 4.3).

This shows that 97 (46.6%) lakes were of high or good status with the majority, 39%, in the latter category. Ireland ranks very favourably in a comparison of nutrients and chlorophyll against other European countries. Figure 4.6 compares average concentrations of total phosphorus, chlorophyll, nitrate and ammonia in lakes over the period 2007–2009, which were the latest dates available at the time of writing. Ireland has the third lowest concentrations of total phosphorus; the 4th lowest concentrations of chlorophyll and ammonia; and the 7th lowest concentrations of nitrate or oxidised nitrogen in this representative network of lakes.

Table 4.3 Lake Water Quality in Ireland – Ecological Status 2008–2010 (Source: EPA)

<table>
<thead>
<tr>
<th>Ecological Status</th>
<th>Number of Lakes</th>
<th>% of Lakes</th>
<th>Surface Area (km²)</th>
<th>% Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>16</td>
<td>7.7</td>
<td>22.1</td>
<td>2.3</td>
</tr>
<tr>
<td>Good</td>
<td>81</td>
<td>38.9</td>
<td>412.0</td>
<td>42.0</td>
</tr>
<tr>
<td>Moderate</td>
<td>69</td>
<td>33.2</td>
<td>282.3</td>
<td>28.8</td>
</tr>
<tr>
<td>Poor</td>
<td>37</td>
<td>17.8</td>
<td>257.2</td>
<td>26.2</td>
</tr>
<tr>
<td>Bad</td>
<td>5</td>
<td>2.4</td>
<td>7.4</td>
<td>0.8</td>
</tr>
</tbody>
</table>
As noted earlier with river quality, there is no room for complacency in terms of lake water quality, with only 46.6% of the monitored lakes achieving the targets of the WFD.

A reduction in the total amount of nutrients delivered to lakes via their tributary rivers is a key focus of the WFD programme of measures.

The EPA is working towards a set of phosphorus loading limits for individual lakes, based on an extensive new set of bathymetric measurements made over recent years that will allow volume and residence time of water in these lakes to be calculated and, thus, phosphorus loadings in terms of annual targets. Programmes of measures to achieve these new limits will need to be more focused than current measures, and to bring about further improvements in lake water quality. As with the rivers feeding into the lakes, these measures will focus on nutrient sources, both point source and diffuse.
A total of 121 transitional (estuaries) and coastal water bodies were assessed for the period 2007–2009 for WFD ecological status classification (Table 4.4). Of these 55 (46%) were classified as either high or good status with over 50% classed as moderate status and 3% assigned poor status.

In European terms, Ireland’s transitional and coastal waters are relatively good – as might be expected from Ireland’s western location on the North Atlantic. This is borne out by the OSPAR Commission assessments (OSPAR, 2009), which found that problem areas are confined to estuaries and the nearshore coastal zone. While transitional waters are under pressure due to the majority of Ireland’s population living at or next to the coast, they still rank in the top five across Europe. For coastal waters, Ireland ranks at or close to the top in terms of proportion of water bodies meeting high status or high and good status. 70% of Irish coastal waters already reach this standard.

Urban wastewater treatment plants pose the biggest threat to transitional waters, but major improvements have been seen where new treatment plants have been installed (e.g. Sligo). Nitrate from agricultural sources is a particular issue in some estuaries such as the Argideen, near Courtmacsherry in Cork, where extensive sea lettuce growths have given rise to odour and nuisance problems. As with rivers and lakes, the reduction of nutrient inputs is the key to improving the status of Ireland’s transitional and coastal waters.

<table>
<thead>
<tr>
<th>Number of Water Bodies</th>
<th>%</th>
<th>Area (km²)</th>
<th>%</th>
</tr>
</thead>
</table>
| High                   | 19| 16         | 1879  
| Good                   | 36| 30         | 729   |
| Moderate               | 62| 51         | 1500  |
| Poor                   | 4 | 3          | 5     |
| Bad                    | 0 | 0          | 0     |
| Total                  | 121| 4114       |
Drivers and Pressures

There is now a very good understanding of causes of water pollution in Ireland, based on long-term pollution-monitoring field work and supported by detailed risk assessments undertaken for the WFD, as well as international research. The pressures that impact on ecological status are clear and the corresponding remedies are also clear.

The EPA has identified the main suspected causes of pollution in water quality reports published over many years. The most recent overview for rivers is shown in Figure 4.7 (based on McGarrigle et al., 2010), in which 953 polluted river sites in catchments across Ireland – taken from a total monitoring programme of 2,500 sites – were analysed in terms of their catchments and observed sources of pollution in the field. These sites are all on rivers, but improving their water quality is also the key to improving water quality in lakes and transitional and coastal waters.

In broad terms approximately half of the 953 sites assessed are polluted due to what may be termed ‘large point sources’ such as municipal wastewater treatment plants. The other half are polluted as a result of diffuse sources, particularly agricultural activities, as well as a range of other activities such as forestry and peat harvesting.

Responses

Water Framework Directive

The seven River Basin Management Plans (RBMPs) submitted to the EU in 2010 include programmes of measures for the restoration or maintenance of the status of all water bodies by 2015, 2021 or 2027.

1. Controlling the inputs of phosphorus and nitrogen to waters.
2. Controlling inputs of oxygen-using matter (e.g. silage, milk waste, sewage).
3. Controlling pathogens in water.
4. Complete elimination of dangerous substances (priority substances) and control of specific pollutants to protect aquatic communities and human health.

5. Ensuring that there is a sufficient volume of water in all our water bodies.

6. Controlling hydromorphological conditions (physical characteristics of the shape and boundaries of the water body) both in-stream and along riparian zones.

Reaching these goals of the WFD is the major task now facing Irish water managers (Table 4.5). The plans themselves may be seen as somewhat generic, but with prioritisation and breakdown to local level, together with on-the-ground actions, progress can be made. Examples of such progress already made are outlined in the topic boxes: ‘Encouraging Results in Limerick’ and ‘Elimination of Serious Pollution’.

Between 2010 and 2012, the European Commission conducted a ‘Fitness Check’ of EU Freshwater Policy and an assessment of the RBMPs of the EU Member States. It found that there were weaknesses in the implementation of the current EU water legislation across Europe generally and that, in addition, there are conflicts between the EU’s water policy and other sectoral policies’ objectives (EC, 2012). In particular, the EC identified the need for improved coherence with the Common Agriculture Policy and with EU Regional Policy to ensure EU funds are better targeted at measures that deliver improvements to water and compliances with water legislation. Improved coherence is also needed with renewable energy and transport policy to ensure that measures adopted for climate mitigation do not cause unintended negative impacts on water. As part of a response to the challenges and to ensure the achievement of EU water policy objectives, the EC has proposed a Blueprint to Safeguard Europe’s Water Resources (EC, 2012). The overall aim of the Blueprint is to ensure availability of good-quality water for sustainable and equitable water use in line with the WFD objectives. The time horizon of the Blueprint is 2020, as it is closely related to the EU Resource Efficiency Roadmap, and will in fact be the water milestone on that Roadmap.

The main focus of the proposed Blueprint is to:
- improve the implementation of current EU water policy
- foster the integration of water and other policies’ objectives, with trade-offs managed on the basis of a better understanding of the costs and benefits of both economic activities and water resources management
- seek the completion of the EU water policy framework, especially in relation to water quantity, efficiency and adaptation to climate change.

### Tackling Diffuse Pollution

Agricultural activities associated with water pollution include land spreading of artificial fertilisers and animal manures in unsuitable climatic and ground conditions, silage effluent discharges, farmyard runoff, watering animals and poorly managed ring feeders.

A range of actions are available to control water pollution under existing legislation. The implementation and enforcement of the Nitrates Action Plan under the EU Nitrates Directive is the most important measure to address diffuse agricultural pollution of freshwaters. This includes a code

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**Table 4.5** Percentage of River Water Bodies within Individual River Basin Districts Planned to Achieve at Least Good Status by 2015, 2021 or 2027

<table>
<thead>
<tr>
<th>River Basin District</th>
<th>2009</th>
<th>2015</th>
<th>2021</th>
<th>2027</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eastern</td>
<td>40</td>
<td>~40</td>
<td>80</td>
<td>100</td>
</tr>
<tr>
<td>Neagh Bann</td>
<td>22</td>
<td>27</td>
<td>99</td>
<td>99</td>
</tr>
<tr>
<td>Northwestern</td>
<td>54</td>
<td>71</td>
<td>99</td>
<td>99.9</td>
</tr>
<tr>
<td>Southeastern</td>
<td>47</td>
<td>60</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Shannon</td>
<td>42</td>
<td>61</td>
<td>99</td>
<td>99</td>
</tr>
<tr>
<td>Southwestern</td>
<td>67</td>
<td>84</td>
<td>99.7</td>
<td>100</td>
</tr>
<tr>
<td>Western</td>
<td>66</td>
<td>74</td>
<td>99.9</td>
<td>100</td>
</tr>
</tbody>
</table>
of Good Agricultural Practice (GAP) which is mandatory for all farms. The Department of Agriculture, Food and the Marine (DAFM) undertakes approximately 3,500 farm surveys each year under cross-compliance rules. However, the GAP Regulations are unlikely to be sufficient to protect high-status water bodies in all cases, and special sub-basin plans have been prepared for freshwater pearl mussel catchments. In addition, DAFM and the EPA licensing and enforcement activities have important roles in the regulation of landspreading of slurry generated through intensive agricultural activities.

The measures for tackling pollution must also be also integrated with other measures, such as drinking water source protection or bathing and shellfish waters management.

Surface water–groundwater interactions must be taken into account, and likewise river–lake and river–estuary interactions, to ensure that an holistic approach is taken to water management in Ireland. Finding sources of diffuse pollution can be difficult. New investigative tools such as the Small Stream Risk Score (developed during the first phase of the WFD implementation) allow sources of diffuse pollution to be pin-pointed by sampling small streams across a catchment upstream of a mainstem river site that is polluted.

**Domestic Waste Water Treatment Systems**

In most rural areas the majority of the population use on-site wastewater treatment systems such as septic tanks. If poorly sited and/or not properly maintained, these systems can pollute groundwater, surface water and drinking water supplies and impact on human health. The EPA has published a revised code of practice for wastewater treatment and disposal systems in unsewered areas (EPA, 2010) that is referenced in revised building regulations and will be applicable for all new builds. New legislation dealing with registration and inspection of septic tanks was passed in 2012 (Water Services (Amendment) Act 2012). This legislation is Ireland’s response to a European Court of Justice (ECJ) ruling against Ireland in relation to on-site waste water treatment systems. The new legislation provides for the establishment of a registration system for domestic on-site waste water treatment plants and requires the EPA to put in place a national inspection plan in conjunction with the local authorities.

**Forestry Issues**

Afforestation on peat soils has the potential to cause significant nutrient and silt losses at the establishment and harvesting phases especially. Large areas of maturing conifers planted on upland peat soils are due to be harvested in the coming years. Residual phosphorus left behind can leach out into surface waters due to the low capacity of peat to bind phosphorus. Silt loss from harvesting operations can damage salmonid spawning beds or freshwater pearl mussel populations. Control of silt and nutrient losses is required to minimise the impact of forestry on water quality. The Forest Service’s iFORIS GIS-based management system for forestry grants is being used to ensure that planting, felling and road building operations in forests are approved only following detailed environmental consultation with a range of public bodies and the general public.

**Encouraging Results in Limerick**

Catchment surveys and intensive follow-up measures by the local authority focused on stemming diffuse pollution in the catchment of the River Deel in Co. Limerick have shown some dramatic improvements. Phosphate levels in the River Deel have dropped by a factor of three since 2002 (Figure 4.8) and ecological status had improved as a result (Goggin, 2011). The increase in concentration in 2011 is attributed to slurry spreading, at the start and end of the close period when conditions are at their wettest, causing runoff to water.

**Figure 4.8** Decline in Phosphate Concentrations in the River Deel, at Askeaton Bridge, Co. Limerick (Source: Goggin, 2011)
Tackling Point Source Pollution
In some respects, point source pollution is easier to resolve than that from diffuse sources, because the location and pollutant load can be identified. In many cases, the large point sources of pollution will require investment and infrastructure upgrades, as indicated in the EPA’s regular reports on urban waste water treatment. A key finding of the EPA’s most recent assessment on urban waste water treatment plants (Monaghan et al., 2012) shows that discharges from 57 waste water works are causing pollution in rivers or bathing waters. The other main findings of this assessment are that:

- 93% of urban waste water discharges in Ireland received secondary treatment or higher (Figure 4.9)
- 11 large urban areas do not meet the Urban Waste Water Treatment Directive (UWWTD) requirement to have secondary treatment in place. These include, for example, Bray and Ringaskiddy, where the provision of treatment is now 10 years overdue; Clifden, where the old plant is impacting on bathing water; and Moville, where discharges are causing serious pollution to the River Bredagh
- Eight urban areas do not meet the UWWTD requirement to provide nutrient reduction in addition to secondary treatment for discharges to sensitive water areas by specified dates. These areas include the cities of Dublin, Cork and Kilkenny
- 46% of waste water treatment plants did not meet all waste water quality standards or EPA guidelines.

Perhaps one of the biggest changes since the publication of the last State of the Environment Report in 2008 was the introduction of a formal licensing system for municipal waste water treatment plants. The EPA is responsible for licensing waste water treatment plants for large towns, and for certification of treatment plants for smaller agglomerations. The EPA had granted 190 licences and 512 certificates by the end of 2011. Compliance with these licences and certificates will continue to drive improvements in waste water treatment and water quality in Ireland.

Elimination of Serious Pollution
The extent of serious pollution of rivers has been reduced significantly in recent years due to increased enforcement as part of a national programme coordinated by the EPA – the ‘Red Dot programme’. In 2004–2006, 39 sites were categorised as seriously polluted, in 2007–2009 this had dropped to 20 sites and in 2011 there was a further significant reduction to 11 sites. Currently, approximately 18 km of river channel remains seriously polluted from a total length of 13,200 km surveyed under the WFD.
Outlook

Over the years, water protection efforts have succeeded in reducing the extent of serious pollution in rivers from 174 km in 1971 to just 18 km in 2011. The main task now is to improve the status of some 4,000 km which is currently at less than good ecological status. With a focused programme, emphasising the same site-by-site approach, that has worked well with the seriously polluted sites, progress can be made in achieving the status targets set out in the RBMPs under the WFD.

Lake water quality has remained relatively static over recent decades, albeit with some dramatic reductions in chlorophyll levels due to the introduction of zebra mussels. Lakes will respond to measures to reduce nutrient inputs more slowly than rivers, but nonetheless the measures taken to address river pollution are also the key to improving lake water quality, as very few lakes have direct discharges into them.

Some improvements in the water quality of transitional and coastal waters have been noted due to the commissioning of new waste water treatment plants in coastal towns such as Sligo Bay and the Liffey estuary. There is still a significant lack of adequate treatment levels in many coastal towns, with 42 towns, important as tourist centres linked to water activities, without secondary treatment. The control of nutrient inputs from inland diffuse and point sources is also crucial in improving the water quality of estuaries and bays.

Groundwater status is heavily dependent on surface water status, and a good understanding of the linkages between surface water and groundwater is required in order to ensure success in improving groundwater quality. Overall, there is a continued need for improved protection of groundwater, especially in the context of achieving the WFD objective of good status for all waters by 2015. In some instances, it will not be feasible to meet this objective by this deadline, as it may take a number of years for the measures to bring about a reduction in concentrations of nutrients. This is because the nitrate and phosphate will require time to flush through the groundwater system. If all the basic and supplemental WFD measures are implemented, the objectives should be reached within the 2021 or 2027 extended deadlines. However, for a small number of water bodies (for example, with pollution from historic mining activities), it is likely that it will not be technically or economically feasible to achieve the WFD objective by 2027. These bodies will be candidates for less stringent objectives.

Special protection measures are needed to protect and restore high-status waterbodies of all types, as they are susceptible to degradation due to pressures such as field drainage and fertilisation, tree planting, tree felling, house-building, onsite waste water treatment plants, insecticide usage, road building and wind farm construction. The impacts of these pressures are not always easily controllable under current legislation.

The development strategy for the agriculture sector, Food Harvest 2020 (DAFF, 2010) proposes a 50% increase in milk production by 2020. While environmental sustainability is a key underlying principle of Food Harvest 2020, the milk production targets will present a significant challenge to meeting WFD objectives. It is vital that future agricultural practices be developed and implemented to be fully sustainable, and not prevent Ireland from meeting its EU obligations in relation to water.
The paper on the Reform of the Water Sector in Ireland (DECLG, 2012) confirmed the strategic importance of Ireland’s water resources and signalled the Government’s intent to take a national approach to water with the aim of conserving water resources and increasing the cost efficiency associated with water provision. In April 2012, the Government announced the creation of Irish Water as an independent State-owned subsidiary within the Bord Gáis Éireann group. It is envisaged that Irish Water will take over the water investment programmes of the 34 county and city councils, with the key aim of supervising and accelerating the pace of delivery of planned investments needed to upgrade the water and sewerage networks.

Conclusion and Future Challenges

Overall, while water quality in Ireland is good relative to other EU countries, Ireland faces some considerable challenges in the coming years to meet the requirements of the WFD and other water directives. The three main challenges for water quality management are to eliminate serious pollution associated with point sources (waste water treatment plants); to tackle diffuse pollution (pollution from agricultural activities and septic tanks); and to use the full range of legislative measures in an integrated way to achieve better water quality. There is a pressing need to develop site-by-site actions for the water bodies reported as being at less than good status. By prioritising a subset of these each year, improvements can be made in rivers in the short term (with a slightly longer recovery time for lakes and estuaries). In the longer term, the formal timelines set out in the RBMPs for improvements (Table 4.5) can be achieved even though they are quite ambitious, provided the necessary structures and resources are in place.

However, the current governance arrangements for the implementation of the Water Framework Directive are inadequate. The published River Basin Management Plans noted that: “The current administrative systems are fragmented along administrative lines and do not facilitate analysis, identification and implementation of the most cost-effective solutions to manage water quality at river basin level. An RBD can cover the areas of responsibility of a large number of bodies e.g. 18 local authorities in the case of the Shannon RBD. Furthermore, the implementation of many of the measures necessary to achieve the objectives of the plans is the responsibility of national rather than local authorities.”

Discussions to resolve this issue are ongoing between the DECLG, EPA, local authorities and other relevant bodies, and these are running in parallel with the development of the new model for management of national water services – Irish Water. The emerging consensus of a governance structure for the WFD is that it would consist of three interlocking levels with specific roles identified at each level, as follows.
Tier 1: National Management and Oversight: Led by the deCLG, the main emphasis would be on:
- preparation of policy and national regulations
- steering the WFD implementation at a national level
- addressing funding priorities, including integrating the Water Services Investment Programme and WFD programmes of measures
- national-level interaction with Irish Water
- planning and development coordination related to water-quality issues.

Tier 2: National Technical Implementation and Reporting: Led by the ePA, the activities would focus principally on:
- monitoring, assessment and reporting
- production of River Basin Management Plans
- evaluation and implementation of measures
- monitoring of enforcement tasks and environmental outcomes.

Tier 3: Regional Implementation via Water Networks: Led by the lead local authority within the RBD, this level would address:
- public awareness and participation
- implementation of Programmes of Measures by relevant public bodies, tracking and reporting, in consultation with EPA
- local authority monitoring, licensing and enforcement actions
- follow-up investigative monitoring aimed at pin-pointing sources of pollution.

As the key aims of the WFD are to maintain the existing satisfactory water status where present in surface waters and groundwater and to achieve good status where the status is currently unsatisfactory, the governance structures and administrative arrangements must support this in every way possible. As such, it is essential that the relevant Government departments, State agencies and local authorities work in close partnership to meet Ireland’s obligations under the WFD in as efficient and effective a manner as possible.

References


