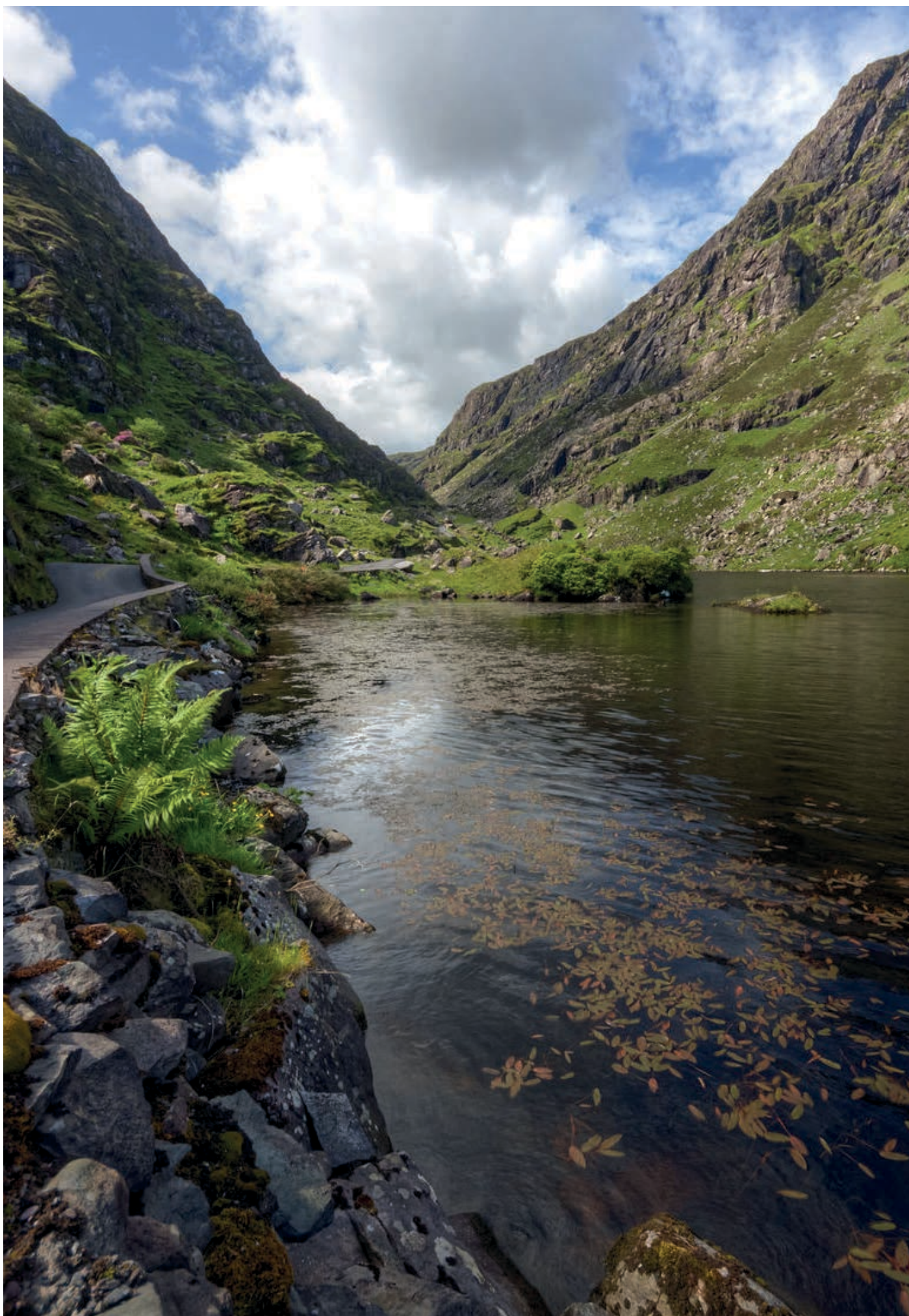




PUBLIC CONSULTATION
ON THE RIVER BASIN
MANAGEMENT PLAN
FOR IRELAND (2018-2021)



An Roinn Tithíochta, Pleanála,
Pobail agus Rialtais Áitiúil
Department of Housing, Planning,
Community and Local Government



Foreword



Water is essential for life and for our natural environment. It is also critical to our wellbeing and our economy and provides essential services supporting people and communities, agriculture, industry, transport and tourism. However, water is a fragile resource that needs to be protected from the many pressures that are placed on it. It must be managed and used in a sustainable manner.

River Basin Management Planning provides a catchment based framework to protect our waters and develop collaborative approaches to water management that should engage all stakeholders, increase awareness of its value, protect biodiversity and deliver multiple benefits to all stakeholders.

This second cycle River Basin Management Plan aims to build on the progress made during the first cycle. But we also recognize that we need to improve on the way we have done things to date. For this new plan we have substantially strengthened the evidence base on which we will make management decisions; we have improved governance and planning structures to ensure better delivery; and we are making great efforts to facilitate effective and meaningful public engagement and participation at local, regional and national level.

River Basin planning requires technical expertise and knowledge – but public engagement and participation are equally important if we are to understand the value of water and work together to protect and restore our water environment. This draft plan has been developed in a collaborative way with many stakeholders, and it has been informed by a series of public consultations undertaken to date. It is vital that this approach continues both in terms of developing the final plan and as we move into the implementation and delivery phase.

Over the coming months my Department will continue to engage with stakeholders to inform and improve the final River Basin Management Plan. I would encourage all interested parties to read this draft plan and provide feedback to this consultation process. It is critically important that the final plan reflects the best approach to protecting and restoring our water environment.

Simon Coveney T.D.

Minister for Housing, Planning, Community and Local Government
February 2016.



RIVER BASIN PLANNING REQUIRES TECHNICAL EXPERTISE AND KNOWLEDGE – BUT PUBLIC ENGAGEMENT AND PARTICIPATION ARE EQUALLY IMPORTANT IF WE ARE TO UNDERSTAND THE VALUE OF WATER AND WORK TOGETHER TO PROTECT AND RESTORE OUR WATER ENVIRONMENT.

Responding to the public consultation process:

This consultation will be open for 6 months until Thursday 31st August 2017.

To aid in the process of collating and considering all responses, and how they can best feed into finalizing the plan, we would appreciate if responses are as concise as possible. For specific comments and inputs, responses should identify the issues being addressed, in line with the structure of the plan itself which broadly covers:

1. Background and approach to developing the plan
2. Review of the first cycle River Basin Management Plan
3. Current state of the water environment & the catchment characterisation process
4. Environmental objectives and priorities
5. The proposed programme of measures
6. Proposed measures for protected areas and high status waters
7. Economic analysis
8. Implementation strategy
9. Communication and public engagement
10. Water quality monitoring
11. Expected outcomes

We welcome early responses to this consultation, which will facilitate us in considering how the final plan can best reflect the views expressed through this process.

Responses should be submitted, preferably in word format, to RBMP@housing.gov.ie

Alternatively, responses can be posted to:

River Basin Management Plan Consultation
Water and Marine Advisory Unit
Department of Housing, Planning,
Community and Local Government
Custom House
Dublin 1.

A paper version of the draft plan can also be requested from the above email or postal address.

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Executive Summary

-Draft River Basin Management Plan 2018-2021

Executive Summary

-Draft River Basin Management Plan 2018-2021

This second cycle draft River Basin Management Plan represents a new approach to river basin management planning. Ireland is now taking a single river basin district approach with a much improved evidence base to underpin decision making, at both national and local level. The approach to public consultation and engagement has also been greatly strengthened.

Progress during the first cycle largely focused on the implementation of basic measures such as the Nitrates Action Programme and providing investment in line with meeting the requirements of the urban waste water treatment directive. The approach to this second cycle is to continue progress with such measures, but to now also ensure that supporting measures are implemented on a prioritised basis, where necessary. Building the necessary capabilities, expertise and structures are central to ensuring delivery of this approach.

In line with this, the plan has placed a major focus on getting the governance and delivery structures right for an effective catchment based approach. Clear priorities are set out in the plan, which will ensure that all stakeholders are working together with a clear focus on delivering positive outcomes. National authorities retain responsibility for implementation of national programmes, with regional structures driving the implementation of supporting measures. Meaningful stakeholder and public engagement will be led by a soon to be established National Water Forum and the Local Authority Waters and Communities Office (LAWCO). The former will facilitate public and stakeholder engagement in water policy at national level, and the latter will drive public engagement, participation, and consultation with communities and stakeholders at local and regional level. This engagement will be further supported through the catchments.ie website, and a wide range of other activities aimed at facilitating and encouraging engagement.

Some of the most important measures in the plan include; planned investment by Irish Water of approximately €1.7bn in wastewater projects, programmes and asset maintenance; improved operational practices across waste water services being driven by Irish Water; a multifaceted approach to knowledge exchange in agriculture including through the National Sustainability Dairy Forum which will address on farm economic and environmental sustainability challenges for the dairy industry through a joint industry, farmer and government approach; a focus on protecting high status waters through the development and implementation of a “blue dot programme”; a commitment to explore the feasibility of implementing measures to improve fish connectivity in the Lower Shannon catchment; and the facilitation of meaningful public engagement through the National Water Forum and LAWCO.

This draft plan sets a significant level of ambition, both in terms of the level of commitment and investment for basic measures, and the expectation of having supporting measures implemented in approximately 600 to 700 prioritised water bodies over the period of this cycle. Combined with improved implementation and engagement structures this should see good progress in water quality improvements and in the building of capabilities, knowledge and expertise for the future.

This executive summary outlines the key aspects of the draft second cycle River Basin Management Plan.

IT PROVIDES:

- A brief introduction and background to the second cycle River Basin Management Plan.
- Key findings of the most recent water quality results and the outcomes of the risk characterisation process in terms of the share of total water bodies found to be at risk of not meeting the requirements of the Water Framework Directive.
- Summary information on the significant pressures for at-risk water bodies.
- The environmental objectives of the WFD and the priorities for this second planning cycle given the scale of the challenge presented.
- An outline of the key basic and supporting measures (from our full Programme of Measures) aimed at meeting our environmental objectives.
- The implementation strategy and structures, and the measures we propose to take to improve communication and public and stakeholder engagement.
- A summary of the expected outcomes based on our proposed measures and implementation plans.

Introduction & Background

The Irish River Basin District covers an area of 70,273km², with 46 catchment management units – consisting of 583 sub-catchments with 4,832 water bodies. With regard to protected areas within the district, there are 134 designated bathing waters, 64 shellfish waters, 42 nutrient sensitive areas and 358 special areas of conservation (SACs) with water dependency. These SACs are geographically concentrated along the western seaboard - with a significant overlap between high status waters and SACs. The Irish River Basin District has a population of around 4.76 million, with 33% of people living in cities, 29% in towns and 38% in rural areas. The requirement for water and waste water services reflect these spatial patterns. Nationally the economy is strongly export focused – but the sectoral drivers of economic growth across the RBD are diverse – with the agriculture and food sector particularly important in rural areas.

This second cycle River Basin Management Plan aims to build on the progress made during the first cycle. Key measures during the first cycle included the licensing of urban waste water discharges and associated investment in urban waste water treatment and the implementation of the Nitrates Action Programme (Good Agricultural Practice Regulations). The former has resulted in significant progress in terms of both compliance levels and the impact of urban waste water on water quality. The latter provides a considerable environmental baseline which all Irish farmers must achieve – and has resulted in improving trends in the level of nitrates and phosphates in rivers and groundwater. It is acknowledged, however, that the development and implementation of supporting measures during the first cycle was not sufficiently progressed.

In more general terms, three key learnings have emerged from the first cycle, and through the public consultation processes for developing the second cycle plan. Firstly, the structure of multiple RBDs did not prove effective, either in terms of efficiency of developing the plans or in terms of implementation of those plans. Secondly, the governance and delivery structures in place for the first cycle were not as effective as expected. Thirdly, the targets set were too ambitious and not grounded on a sufficiently developed evidence base.

In line with these three key learnings, we have used three guiding principles in developing this draft RBMP. Firstly, the development and implementation of this plan requires effective and efficient national, regional and local structures – and integration of these structures to ensure effective co-ordination between scientific understanding of the problems to be addressed, policy development and on the ground delivery. Secondly, the targets set in the plan must be based on sound evidence and be ambitious but achievable. Thirdly, we must continue to ensure effective national measures are in place to address pressures on a whole of River Basin District basis, but, where such broad based measures are not sufficient, the delivery of supporting measures must be prioritised and ensure the implementation of “the right measures in the right place”.

Water Quality Status and Catchment Characterisation

The 2013-15 status information shows 55% of river water bodies, 46% of lakes, 32% of transitional waters and 76% of coastal waters achieving good or high status. For groundwater, 91% of water bodies are at good status. Nationally the number of monitored river water bodies and lakes at good or high status appears to have declined by 3% since 2007-2009. However, this decline also masks an underlying trend of improvement and dis-improvement across monitored river water bodies and lakes since 2009. Provisional figures from the Environmental Protection Agency suggest that approximately 900 river water bodies and lakes have changed status over the period of the first cycle. The findings also show that high status waters remain under continued pressure – with 10% of monitored river sites having high status in 2013-15 compared to 13% in 2007-2009.

For our protected areas, 93% of bathing waters met the required standards in 2015. For shellfish waters the most recent information, for 2015, shows 75% of sites meeting the microbiological guide value. For SACs with water dependency, around 60% of river water bodies and almost 70% of lakes achieved their required status. However, the situation for SACs in transitional waters was less positive – with 37% of such areas meeting their required standards of good status.

The River Basin District characterisation process goes beyond the classification of status and assesses whether a water body is at risk of not meeting its objectives (i.e. good status or high status) based on the review of information such as water quality trends, catchment pressures and expert local knowledge. Currently 1,945 water bodies are classified as not at risk, 1,515 are classified as at risk, with the remainder requiring further investigation.

Significant pressures on “at risk” water bodies

Having identified those water bodies at risk of not meeting their objectives, the characterisation process then looks at the significant pressures causing this risk. For the 1,360 river and lake water bodies at risk of not meeting their objectives the significant pressures impacting on them include agriculture (64%), urban waste water (22%), hydromorphology (19%), forestry (16%), domestic waste water (12%), peat extractive industry (10%) and urban run-off (10%). For the at risk river and lake water bodies, 47% of them are subject to a single significant pressures, with the remaining 53% subject to more than one significant pressure.

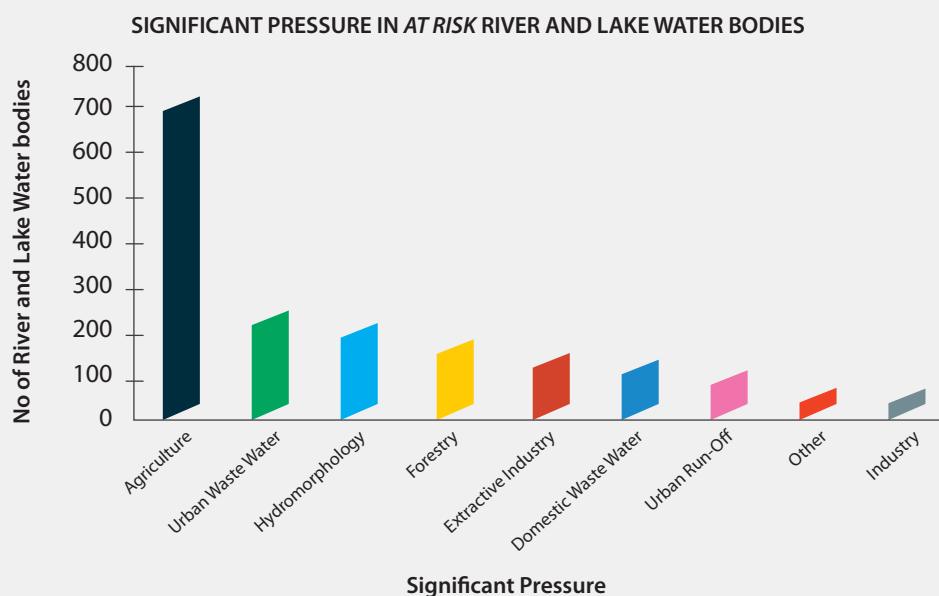


Figure A: Frequency of significant pressures on at risk river and lake water bodies

Environmental Objectives and Priorities

In broad terms the objective of the Water Framework Directive is to (i) prevent the deterioration of water bodies and to protect, enhance and restore them with the aim of achieving at least good status and (ii) to achieve compliance with the requirements for designated protected areas.

Whilst the objectives of the Directive clearly set out the end goals, the challenges presented in achieving these objectives are very significant. Therefore, a key purpose of this plan is to identify priorities and ensure that implementation of this plan is guided by this prioritisation. The following evidence based prioritisation is proposed for this river basin planning cycle:

- Ensure full compliance with relevant EU legislation
- Prevent deterioration
- Meeting the objectives for designated protected areas
- Protect high status waters
- Implement targeted actions and pilot schemes in focus sub-catchments aimed at (i) targeting water bodies close to meeting their objective and (ii) addressing more complex issues which will build knowledge for the third cycle.

Programme of Measures - Summary of Key Measures

In line with the pressures identified through the characterisation process, and the priorities set out above, the following are the key measures aimed at moving towards meeting the environmental objectives of the WFD:

- Compliance with the Good Agriculture Practice Regulations through continued implementation of the Nitrates Action Programme and associated inspection regime.
- Implementation of agri-environment schemes through the Rural Development Programme (RDP) which will lead to investment in nutrient storage and improved nutrient utilisation. In particular the targeted approach to the GLAS scheme, which will have 50,000 participants by end-2017 will ensure appropriate supporting measures on farms to protect and improve water quality.
- Knowledge transfer programmes within the agriculture sector will be used to promote better nutrient management and farm point source management. The approach to this will have three strands.

- The National Dairy Sustainability Forum will aim to collaboratively address the on farm economic and environmental sustainability challenges for the dairy industry in a broader and more strategic way than currently takes place, and realise the benefits of the knowledge that has developed over recent years. To do so it will establish a co-operative led pilot programme to incorporate best practice on selected farms. It will also develop a wider promotion programme on better nutrient management and farm point source management to be implemented for dairy farmers supplying to co-operatives. It is envisaged that this approach will be part of an evolution of the existing Origin Green scheme.
- A knowledge transfer programme for farmers will be funded through the RDP to be delivered by both Teagasc and private sector consultants. This will aim to engage with up to 27,000 farmers over the period 2017-2021.
- An on-line nutrient management planning system will be rolled out for use by all farmers. Use of this system will be mandatory for farmers in the Green Low Carbon Agri-Environment Scheme and for derogation farmers.
- The National Inspection Plan 2018-21 for domestic waste water systems, to be developed in 2017 by the EPA, will use the outputs of the catchment characterisation work to further improve the risk based approach to inspection of septic tanks.
- There is significant planned investment in urban waste water collection and treatment infrastructure. This will include, for example, the provision of new or upgraded treatment plants in 105 agglomerations or urban areas ensuring their compliance with the requirements of the Urban Waste Water Treatment Directive.
- Forestry regulations and policy have been re-aligned to contribute to achieving water quality objectives and these will be fully implemented. Forestry funding schemes and other resources will be promoted and strategically deployed to protect and improve water quality.
- For peat extraction, new legislation is to be introduced to improve the environmental regulation of large and small scale commercial peat harvesting. The Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs will oversee the implementation of the Peatland strategy. Bord na Mona will implement their Sustainability 2030 Strategy and Biodiversity Action Plan, both of which address the long-term rehabilitation of cutaway bogs.

- Relevant EU regulation with regard to Invasive Alien Species (IAS) will be implemented, along with specific plans for priority IAS. Clear governance and co-ordination structures across relevant bodies will be developed, and community engagement harnessed to ensure the long term sustainability of projects aimed at preventing and mitigating pressures from IAS.
- To work to address significant pressures arising from hydromorphology, the EPA and Inland Fisheries Ireland (IFI) will improve assessment methods and knowledge in relation to the physical condition of rivers lakes and marine coastal waters to inform and support future management measures. The Office of Public Works (OPW) will incorporate mitigation measures when undertaking channel maintenance over 2,000 kilometres per year.
- In addition the feasibility of implementing measures to improve fish connectivity in the Lower Shannon catchment will be assessed.
- The Department of Housing, Planning, Community and Local Government will progress proposals to establish a register of relevant water abstractions, and consult on a proportionate and risk-based framework for the regulation of such abstractions to ensure continued sustainable use of our water resources. EPA will continue work on assessing risk due to abstractions, including making use of new information as it emerges during the second cycle.
- To protect and restore our high status waters we will establish a “blue dot catchments programme” and associated working group. This will ensure that high status waters are prioritised for the implementation of supporting measures and for available funding.
- For protected areas:
 - Around 350 public drinking water source protection plans will be completed by 2021, with the remaining plans completed by 2027.
 - The 6 current non-compliant bathing waters will be addressed, mainly through the aforementioned Irish Water Investment Plan.
 - Urban wastewater discharges in the vicinity of shellfish waters will be assessed to determine if disinfection of the effluent is required and any necessary measures will be put in place.
 - Also through the Irish Water Investment Plan, and in accordance with the requirements of the Urban Waste



Water Treatment Directive, more stringent treatment will be provided for 16 currently non-compliant agglomerations discharging to designated nutrient sensitive areas.

- SACs with a high status water dependency will be targeted through the “blue dot” programme. Furthermore, under the national conservation strategy for the Freshwater Pearl Mussel (FWPM), the Department of Agriculture, Food and the Marine (DAFM) in collaboration with the Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs (DAHRRGA) will progress a Locally Led Agri-Environment Scheme for eight designated Freshwater Pearl Mussel areas for priority action. In addition, Irish Water investment will see treatment plant upgrades in 10 FWPM catchments. The prioritisation set out in this plan will also see Natura 2000 sites with a good status objective prioritised for action during implementation.

Implementation Strategy

Our implementation strategy focuses on ensuring full implementation of the basic measures through the relevant national authorities and, where these measures are not sufficient to meet the objectives of the WFD, to implement targeted supporting measures. The process of selecting the water bodies to be targeted for action through supporting measures will be driven at regional and local level through local authority structures. The prioritisation of water bodies will take place through 5 regional committees, each chaired by a local authority Chief Executive Officer. This prioritisation will use the EPA catchment assessments as a starting point, with the prioritisation of areas and actions to be agreed with relevant stakeholders based on wider considerations of impacts and feasibility.

Learning from the lessons of the first cycle, the implementation structures aim to ensure effective and co-ordinated delivery of measures. The Water Policy Advisory Committee (WPAC), established as part of the structures for the preparation of this draft RBMP will continue to provide high level policy direction and oversight of implementation. A National Co-ordination and Management Committee (NCMC) will be set up under WPAC to ensure that the measures necessary to achieve our objectives are implemented in an efficient, effective and co-ordinated way. A National Technical Implementation Group (NTIG) will co-ordinate on-going detailed tracking of implementation and provide a forum for knowledge sharing. Finally, the regional local authority structures, with 5 regional committees will drive delivery of supporting measures at local level. This work will be further supported by the Local Authority Waters & Communities Office (LAWCO). In operating within these structures, all the bodies associated with this plan will endeavour to adopt an ethos of actively participating and working together to deliver real action and positive outcomes.

Communication and Public & Stakeholder Engagement

A clear message emerged from the public consultation processes around the need to improve communication and public and stakeholder engagement with regard to the implementation of the RBMP and indeed the broad integrated catchment approach. The concerns centred around facilitating (i) public and stakeholder engagement in national water policy and (ii) public and stakeholder engagement at the regional and local level to contribute to delivery of the plan itself.

To address the former it is proposed to establish a National Water Forum to facilitate stakeholder engagement on all water issues, including issues of water quality and implementation of the WFD. The Forum will determine its own work programme and the means of communicating its views and analysis. However, its views will feed into the proposed implementation structures at all levels, including to WPAC.

The Local Authority Waters and Community Office (LAWCO) will drive public engagement, participation, and consultation with communities and stakeholders at local level, and co-ordinate these activities across all 31 Local Authorities. LAWCO will work to ensure public and stakeholder engagement will result in meaningful public and stakeholder participation in the catchment management approach across the river basin district.

In addition the EPA will continue to lead on networking and knowledge sharing. The WFD app and catchments.ie website will act as both an information and data repository and as a knowledge sharing tool to allow better targeting of measures and co-ordination of implementation.

We will ensure that communication and knowledge sharing activities of both LAWCO and the EPA are integrated with the implementation structures and feed into policy development and the implementation of this plan.



Expected Outcomes

Based on the information set out in the draft plan, we hope to achieve the following over the period to 2021:

- Investment in urban waste water collection and treatment will deliver projects in 105 urban areas and achieve compliance with the requirements of the Urban Waste Water Treatment Directive.
- Due to this investment we expect 6 non-compliant bathing waters and 16 non-compliant discharges to nutrient sensitive areas will meet their requirements.
- 353 public drinking water source risk assessments will be in place.
- The implementation of other basic measures will continue to prevent deterioration and support water quality improvements. In particular the Nitrates Action Programme (NAP) will continue to provide a good environmental baseline for the agriculture sector.
- Based on the priorities of preventing deterioration and meeting high status and SAC objectives, 581 at risk water bodies are identified as requiring additional supporting actions. Whilst the specific water bodies to be prioritised for action are to be decided upon through the regional committee structures, we expect action in the vast majority of these water bodies, including investigative assessments to identify the most appropriate solutions for the specific issues identified.
- A minimum of 30 sub-catchment pilot schemes will be developed targeting sub-catchments with water bodies close to meeting their objectives and also sub-catchments with more complex pressures requiring multidisciplinary and cross-agency approaches. The latter will have the main goal of building knowledge for the third river basin planning cycle.
- In total therefore we would expect supporting measures to be implemented in approximately 600 to 700 water bodies over the period of this cycle. On the basis of these actions, we would expect to achieve general water quality improvements in many of these water bodies. However given the known difficulty in achieving status improvement, we envisage that these actions will likely result in some 150 additional water bodies showing improvement in status by 2021. Further work will be undertaken in 2017 to refine this estimate.
- The remaining water bodies which fall outside the prioritisation for this plan will still benefit from the basic measures, and as resources allow will be targeted for investigative assessments through the processes at regional committee level.

- Key high level actions such as knowledge transfer in agriculture, the National Dairy Sustainability Forum and assessing the feasibility of implementing measures to improve fish migration in the Lower Shannon catchment will be assessed.
- Co-ordinated national, regional and local implementation structures will be put in place to improve implementation and monitoring of actions.
- New public and stakeholder engagement structures will be put in place. LAWCO will drive bottom up public engagement and the National Water Forum will facilitate meaningful public and stakeholder engagement in water policy development.





Section 1:

Introduction

and background

Water is essential for life. Humans need it for drinking and food preparation. It is also vital to our natural environment, supporting plants and animals. Water is critical to our economy, generating and sustaining wealth through activities such as agriculture, commercial fishing, power generation, industry, services, transport and tourism. However, water is a fragile resource that needs to be protected. Waters must be of sufficient quantity and satisfactory quality to protect our aquatic environment and beneficial uses. While the Minister for the Housing, Planning, Community and Local Government has a lead role under the EU's Water Framework Directive, addressing these challenges requires collective action. River basin management planning requires a considerable amount of technical expertise but it also requires the knowledge and perspectives of people who use water in their everyday lives, whether as a source of drinking water for themselves, their livestock or pets, for fishing or swimming or to support manufacturing or power generation or even just for its aesthetic appeal. Water is a fundamental aspect of our lives and river basin planning can assist us in ensuring that we have a healthy water environment for all.

Substantial changes have been made to the approach for developing this draft plan and in the approach to and structures for implementation within it. A clear focus on implementation and improved engagement with all sectors of society has been identified as essential to successful implementation. Moreover, it has been clear that all stakeholders have to engage at national, regional and local level and the analysis has been undertaken to support action nationally and at local water body scale. A substantial effort is also being made to engage communities in valuing and taking action to improve their local waters with the creation of the Water and Communities Office and the catchments.ie website. This draft plan also contains initiatives to develop better national dialogue on the value of water to us all. A new approach to implementation called "integrated catchment management" is being used to support the development and implementation of this plan, using the catchment as the means to bring together all public bodies, communities and businesses.

This second cycle draft River Basin Management Plan (RBMP) sets out the proposed framework for ensuring that Ireland's water environment is protected and improved, in line with the objectives of the Water Framework Directive (WFD). The first cycle RBMP covered the period 2009-2015. Due to some delays in developing this second cycle, this plan covers the period 2017-2021. A third cycle plan will be required for 2022-2027.

This draft RBMP assesses current water quality in Ireland and presents detailed scientific characterisation of our water bodies. The characterisation process also takes into account wider water quality considerations, such as protected areas. The characterisation process identifies those water bodies which are

at risk of not meeting the objectives of the WFD and also the significant pressures causing this risk. Based on an assessment of risk and pressures, a programme of measures has been developed to address the identified pressures and work towards achieving the required objectives for water quality and protected areas. Finally, how the plan and associated programme of measures will be implemented is set out – along with the expected outcomes of these actions.

This draft plan will now be subject to a six month public consultation period running until the end of August. Responses to this consultation, and any further work on the scientific characterisation of our water bodies, will inform revisions to this draft RBMP. It is intended to publish the final RBMP by December 2017, following approval by the Minister for Housing, Planning, Community and Local Government.

1.1 Second cycle River Basin Management Plan in context

The objective of the WFD, and this process of river basin management planning, is to ensure that the required water quality improvements are achieved through a catchment based approach to water management, through a co-ordinated approach by stakeholders across the water sector, and through meaningful public engagement and participation in the development and implementation of plans.

The first cycle of river basin management planning, which covered the period 2009-2015, developed plans and associated programmes of measures on the basis of four River Basin Districts (RBDs) within the Republic of Ireland, and a further three international RBDs (which cut across Northern Ireland and the Republic of Ireland). These plans set ambitious targets that envisaged that the majority of water bodies would achieve good status by 2015.

This second cycle plan aims to build on the positive aspects of the first cycle, and also learn from those aspects which did not progress as well as expected. In this regard Section 3 considers the first cycle in some detail. However, in terms of providing a context to this plan, the following three key learnings have emerged, including through the public consultation processes undertaken to date.

Firstly, the structure of multiple RBDs did not prove effective, either in terms of efficiency of developing the plans, or in terms of implementation of those plans. It is apparent that a single River Basin structure is more sensible in terms the efficient use of resources and ensuring that the similar challenges faced across the country are addressed in a coherent way.

Secondly, and related to the above, governance and delivery structures in place for the first cycle were not as effective as expected. Due in part to the number of RBDs the delivery arrangements were overly complex. In particular, the level

of oversight of programme delivery and on-going review was weak. Whilst national measures have generally been effectively implemented, one could argue that the importance of local delivery for many measures was not well understood in developing the first cycle plans, or more importantly, in considering implementation of the plans. These issues have been taken into account in terms of the implementation structures set out in this draft plan.

Thirdly, the targets set in the first cycle were not realistic. These targets were set at a time when the concept of river basin management planning was new to Member States, and in an Irish context, before the impact of the economic downturn on the capacity to deliver such targets was clear. However, there was also an overarching issue that the level of ambition was not necessarily grounded on a sufficiently well-developed evidence base. A central aspect of the work in developing this second cycle draft RBMP has been to ensure that the evidence base upon which to make decisions is better developed and that the targets set in the plan are achievable.

To develop this improved evidence base the EPA has been carrying out catchment characterisation work to assess the risk status of our waterbodies. In line with the WFD requirements, this catchment characterisation work identified the status of our water bodies, assessed the risk of not achieving the requirements of the directive for these waterbodies, and identified the significant pressures on these at risk water bodies. The process also identified our protected areas, compliance with the requirements for these areas, and the issues to be addressed for those protected areas not currently compliant with their requirements.

The improved evidence base emerging from this EPA characterisation work offers both a better picture of what the current situation is with regard to the water environment, and also allows for an evidence based assessment of what improvements are achievable at both national and local level in the period 2017-2021 and beyond. Where sufficient evidence is not available with regard to specific water bodies or potential measures, the evidence base needs to be further developed over the course of this plan.

In line with these three key learnings, there have been three guiding principles in developing this draft RBMP. Firstly, the development and implementation of this plan requires effective and efficient national, regional and local structures – and integration of these structures. Secondly, the targets set in this plan must be based on sound evidence and be ambitious but achievable. Thirdly, we must continue to ensure effective national measures are in place to address pressures on the water environment, but, where such measures are not sufficient the delivery of supplementary measures must be prioritised and must ensure the implementation of “the right measures in the right place”.

1.2 The Irish River Basin District

For this second cycle, a single national River Basin District has been defined. The Irish River Basin District covers an area of 70,273km². This has been broken down into 46 catchment management units. These units are, in the main, based on the hydrometric areas in use by authorities – with, for example, the River Shannon being sub-divided on the basis of the catchments of its major tributaries. The 46 catchment management units have been broken down further into 583 sub-catchments. These 583 sub-catchments contain a total of 4,832 water bodies, ranging from 3 to 15 waterbodies in each sub-catchment.

Within the RBD there are 134 designated bathing waters, 64 shellfish waters, 42 nutrient sensitive areas, 358 special areas of conservation (SACs) with water dependency and 154 special protection areas (SPAs). The SACs are quite geographically concentrated, in particular along the western seaboard. Related to this the water bodies which are at, or are required to be at, high status are similarly concentrated – with a significant overlap between high status waters and the SACs with water dependency. The SPAs are somewhat more dispersed, but again with particular concentrations along the western seaboard.



Figure 1.1: The Irish River Basin District for the second cycle river basin management plan

The most recent Census data, from April 2016, shows that the Irish River Basin District has a population of around 4.75 million people. Population distributions from the previous census show 24% of the total population of the State live in Dublin City and suburbs, representing the major population centre and accounting for 1.1 million people. There are four other major cities; Cork, Limerick, Galway and Waterford – with populations ranging from 200,000 in Cork City to 52,000 in Waterford. A total of 39 towns, with populations ranging from 10,000 to 40,000 people, account for a further 730,000 people, or 16% of total population. The table below sets out the populations in major settlement types based on 2016 population and the 2011 distributions.

Settlement Category	Number of Settlements	Share of population (%)	Estimated Population
Dublin City and suburbs	1	24	1,141,914
Other major cities	4	9	428,218
Towns 10,000 to 40,000	39	16	761,276
Towns 5,000 to 9,999	41	6	285,479
Towns 1,500 to 4,999	82	6	285,479
Remainder of country	n/a	38	1,808,031
Total population of RBD	n/a	100	4,757,976

Table 1.1 Population and settlement patterns in the Irish River Basin District

A key feature of the RBD is the rural population – with 38% of the population, or 1.74m people, living in rural areas. This high share of rural population in a European context presents some specific characteristics – for example around 30% of dwellings have waste water systems other than connection to public waste water treatment. Similarly, almost 20% of dwellings have drinking water supplies other than from public water schemes.

Nationally the economy is characterised by a strong focus on exports – with the total value of exports in 2015 standing at around €112bn. Key export sectors include medicinal and pharmaceutical products (€30bn), organic chemicals (€21bn) and the broad food, agriculture and beverage sector (€11bn). However, the economic output and drivers of economic growth across the RBD are diverse – and the spatial patterns of economic output reflect the settlement patterns outlined above. This is demonstrated by the regional variation in the relative importance of agriculture – with a high of over 12% of those employed in the Border region working in the agriculture sector, compared to 4% in the Mid-East region and virtually 0% in the Dublin region.

Having provided some context for this plan, and a brief outline of the characteristics of this River Basin District, the next section outlines the approach taken in developing this draft second cycle RBMP, including the methodology applied and the structures put in place to steer the development of this draft RBMP.

Section 2:

Developing the draft River Basin Management Plan

In terms of developing this draft RBMP, a three tier structure across relevant authorities was adopted, following public consultation. At Tier 1, the Minister for the Housing, Planning, Community and Local Government has responsibility for policy, necessary legislation and resourcing the plan. Tier 2 is led by the Environmental Protection Agency (EPA), which is responsible for the characterisation process and assisting and advising the Minister. Tier 3, consists of the co-ordinating local authorities, who have responsibility for implementation of measures on the ground, and the local knowledge required for successful delivery of many potential measures.

This tiered structure for development of the draft RBMP was co-ordinated through both the statutory Water Policy Advisory Committee (WPAC) and a Programme of Measures Steering Group (POMS). The former provided high level policy direction, whilst the latter considered the detailed technical, scientific and policy information to arrive at a programme of measures for the second cycle. The detailed technical and scientific information upon which the POMS Group depended for its work was developed over the past two years by the EPA in conjunction with local authorities and other public bodies. The catchment assessment has and continues to be undertaken at a variety of scales from waterbody to sub catchment to catchment scale. Whilst the majority of this work has been completed and has been central to development of this plan, work will continue into 2017 and that will continue to inform the final plan.

Furthermore, extensive public consultation has been undertaken with regard to the approach to developing this draft RBMP. The implementation plans and structures outlined in Section 9 build on this co-ordinated tiered approach to delivery of the plan, and on the public engagement processes and tools that have been developed and used in delivering this plan.

2.1 Approach to developing this draft RBMP

The approach to developing this draft RBMP is set out in the bullets below, and the structure of this draft RBMP closely follows this outline:

- Assessing the outcomes of the first planning cycle, including public consultation on significant water management issues in Ireland
- Characterising the River Basin District, including an assessment of the current status of our waters and the identification of water bodies at risk of not meeting requirements of the WFD
- Identifying and summarising the significant pressures and impacts of human activities
- Specifically identifying, mapping and characterising our protected areas and high status waters
- Identifying and mapping our monitoring network
- Identifying the environmental objectives and establishing priorities

- Completing a high level economic analysis of water use
- Identifying and summarising a programme of measures based on the characterisation and pressures identified. This programme of measures aims to meet the environmental objectives and specific requirements of the Water Framework Directive.
- Setting out the proposed implementation structures for this plan
- Setting out what we expect this plan to achieve
- Setting out plans for on-going monitoring and reporting on implementation
- Carrying out Strategic Environmental Assessment of this plan.

The above points show the detailed methodology to arrive at this draft plan. The next sections outline three of the key supporting structures for development of this plan; (i) the Water Policy Advisory Committee, (ii) the Programme of Measures Steering Group and (iii) the Public Consultation processes.

2.2 Supporting structures for development of the draft RBMP

2.2.1 Water Policy Advisory Committee

To assist in the development of the draft RBMP, a Water Policy Advisory Committee (WPAC) was established (under SI No. 350 of 2014) to support and advise the Minister on the development of the RBMP. This high level policy Committee, which meets on a quarterly basis, brings together the key national organisations that contribute to delivery of the WFD in Ireland. The Committee is chaired by a representative of the Minister for Housing, Planning and Local Government, and consists of representatives from the following organisations:

- Department of Housing, Planning, Community and Local Government;
- Department of Agriculture, Food and the Marine;
- Department of Communications, Climate Action and the Environment;
- Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs;
- Department of Health;
- Commission for Energy Regulation;
- Local Authorities;
- Environmental Protection Agency;
- Irish Water;
- Inland Fisheries Ireland; and
- Office of Public Works.

WPAC was further supported by the Programme of Measures Steering (POMS) Group which oversaw development of the programme of measures and the draft RBMP.

2.2.2 Programmes of Measures Steering Group

The role of the POMS group was to consider in detail the EPA characterisation work, the outcome of the public consultation process and wider public policy concerns - and to steer the

development of a programme of measures that would effectively address the significant pressures which emerged from the characterisation work. The POMs group consisted of members of the following organisations:

- Department of Housing, Planning, Community and Local Government;
- Department of Agriculture, Food and the Marine;
- Environmental Protection Agency;
- Local Authority Waters and Communities Office;
- Irish Water; and
- Teagasc.

In carrying out its work, the POMs Group considered the outputs of the characterisation work and a number of working papers on issues which largely align to the methodology outlined above. In addition to the organisations listed above other key stakeholder and actors, such as the Department of Communications, Climate Action and the Environment (DCCAE), Inland Fisheries Ireland (IFI) and National Parks and Wildlife Services (NPWS) of the Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs (DAHRRGA) and the Office of Public Works (OPW) were engaged with throughout the process of developing this draft plan. The members of the POMs group, and the other key stakeholders, were also engaged with in a wider sense throughout the catchment characterisation work carried out by the EPA, including through bilateral meetings and existing working groups.

2.2.3 Public consultation processes

Public consultation with regard to the second cycle RBMP commenced in July 2014 when the Minister published a draft timetable and work programme. This draft timetable envisaged a draft RBMP would be published in December 2016, with the final plan emerging at the end of 2017 following a 6 month consultation period. A public consultation on Significant Water Management issues took place from June 2015 until December 2015. The significant water management issues identified in the document for that public consultation are set out in the table below:

Significant Water Management Issues for Ireland for RBMP process 2017-2021	
Societal Factors	Environmental Pressures
Affordability and prioritisation	Pollution from nutrient enrichment
Public engagement	Water and health
Organisation co-ordination	Fine sediment
Co-ordination of plan implementation	Physical changes
Land use planning and water	Abstractions and flows
Floods and water	Hazardous chemicals
Biodiversity management and water	Climate change
	Invasive alien species
	Loss of high status waters

Table 2.1: The significant water management issues identified in the SWMI consultation document

A total of 46 responses to this public consultation were received, and an overview of those responses has been published.¹ The key issues raised include:

- A need for more strategic and co-ordinated approaches to communication, public engagement and stakeholder engagement.
- The relative balance between full characterisation and associated risk assessment, and the need for prioritisation and implementation of measures.
- The importance of the agriculture sector in terms of contributing to water quality improvements – but also the need to ensure all sectors are fully considered.
- The importance of achieving sustained investment and operational improvements for waste water treatment plants.
- The need to specifically address the loss of high status waters.

Related to this consultation on significant water management issues, the Department of Housing, Planning, Community and Local Government (DHPCLG) held a one day workshop in May 2016 to further develop the issues arising from consultation and reach a common understanding with those who responded to the consultation process.

Finally, this draft RBMP is itself now subject to public consultation, with the responses feeding into the process of updating this draft plan and preparation of a final plan by December 2017.

2.3 Environmental Assessment informing the plan

In accordance with European and national legislation, the DHPCLG is undertaking Strategic Environmental Assessment (SEA) and Appropriate Assessment (AA) of the draft RBMP. These processes have been and continue to be iterative in terms of informing a robust final RBMP which fully integrates wider environmental considerations into water management planning.

2.3.1 Strategic Environmental Assessment

Strategic Environmental Assessment (SEA) is a process by which environmental considerations are integrated into the preparation of plans and programmes prior to their completion. The objective of the process is to provide for a high level of protection of the environment and to promote sustainable development by contributing to the integration of environmental considerations into the preparation and adoption of specified plans and programmes, as well as to inform or form the basis of decisions as whether to proceed with a plan, in light of its implications for the environment.

SEA in Ireland is governed by the European Communities Environmental Assessment of Certain Plans and Programmes Regulations (S.I. 435 of 2004 as amended by S.I. 200 of 2011).

¹ Public consultation outcomes on SWMI for second cycle RBMP (2016) <http://www.housing.gov.ie/node/6741/public-consultation-outcomes>

This requires that certain plans and programmes, prepared by statutory bodies, which are likely to have a significant impact on the environment, be subject to the SEA process. A screening of the RBMP for SEA was undertaken by the DHPCLG and it was determined that an SEA would be required. In recognition of this, the SEA process is being applied to the development of the RBMP and has included the preparation of an Environmental Report which accompanies the draft plan for consultation.

2.3.2 Appropriate Assessment

The EU Habitats Directive places strict legal obligations on member states to ensure the protection, conservation and management of the habitats and species of conservation interest in all European Sites. Article 6 of the Directive obliges member states to undertake an 'appropriate assessment' (AA) for any plan or project which may have a likely significant effect on any European Site. The outcomes of such AAs fundamentally affect the decisions that may lawfully be made by competent national authorities in relation to the approval of plans or projects.

The Habitats Directive has clear links to the Water Framework Directive through the Register of Protected Areas, which includes Special Areas of Conservation (SAC) designated under the Habitats Directive, and Special Protection Areas (SPAs) designated under the Conservation of Wild Birds Directive (Directive 79/409/EEC as codified by Directive 2009/147/EC), collectively referred to as 'European Sites'. Article 6(3) establishes the requirement for an AA of plans and projects likely to affect such European Sites.

In compiling the draft plan, the DHPCLG has screened the plan for AA and has concluded that full AA is required. As such a Natura Impact Statement (NIS) has been compiled to further inform the development of the draft Plan. The content of the NIS and submissions made in relation to the draft plan will all be considered prior to a final determination in relation to the AA. As the competent authority for the RBMP, this determination will be made by the DHPCLG.

Both the SEA and AA processes have been carried out in parallel with the drafting of the plan and will continue to inform the plan prior to its finalisation and adoption by end-2017.

2.4 Links to other Government policies and plans

An important part of developing this draft River Basin Management Plan has been to identify and understand the links to other policy areas across Government, and the key plans and programmes either currently in place or planned. This has been greatly informed through the SEA process, which details the plans and programmes that interact with and influence the river basin management planning process. The relevant policy areas include; land use and spatial planning; climate change; flooding; water services policy; waste management; agriculture; fisheries; forestry; and peatlands.

For these and indeed other relevant policy areas the existing policy, plans, strategies and programmes have fed into the development of this River Basin Management Plan. This has been particularly important in areas such as agriculture, forestry and peatlands, where recent strategies have been adopted. Furthermore, the cross-agency collaborative approach to developing this River Basin Management Plan will assist in ensuring that new strategies and plans in relevant policy areas are cognisant of water quality objectives and will, insofar as is possible, align with those objectives. Of particular importance in this regard, and covered in more detail in the relevant parts of this plan are; future planning policy, to be expressed in the forthcoming National Planning Framework; future national climate change mitigation and adaption plans; and the future implementation of recently developed flood risk management plans and ensuring effective co-ordination between the requirements of the floods directive and the water framework directive.

2.5 Critical Timelines

This draft RBMP will remain open for public consultation for 6 months with the responses received, and further on-going work on characterisation, informing finalisation of plan. It is intended to publish the final RBMP by December 2017, following approval by the Minister. The final plan, and associated documents and data, will then be reported to the Commission in line with the requirements of the Water Framework Directive.

Section 3:

Review of 1st Cycle - Measures Implemented and Outcomes

Key measures implemented during the first river basin management planning cycle include putting in place the legal frameworks for (i) implementing the Water Framework Directive itself (ii) establishing licensing regimes for urban waste water discharges (iii) implementing the Good Agricultural Practice Regulations for the protection of waters and (iv) establishing a comprehensive water quality monitoring programme – and the associated implementation of actions in line with the legal frameworks established. These principal measures are outlined in this section. In addition, supplementary or supporting measures were also implemented, and some of these are also briefly outlined in the section. Finally, a brief consideration of the lessons learned and how to best build on the first cycle is provided.

3.1 Key Measures implemented to support the delivery of environmental objectives during the first cycle of River Basin Management Plans

3.1.1 Legal framework for WFD implementation and associated actions

The European Communities Environmental Objectives (Surface Water) Regulations 2009 (SI 272 of 2009) and the European Communities Environmental Objectives (Groundwater) Regulations 2010 (SI 9 of 2010) establish the legal framework needed to implement the environmental objectives of the Water Framework Directive. They lay down the criteria and environmental quality standards for classifying water status and impose an obligation on public authorities to take the necessary steps to achieve the objectives set out in river basin management plans. Both sets of regulations *inter alia* require licensing authorities to examine, and where necessary, review discharge licences where reviews are needed to achieve the water quality objectives set out in river basin management plans. Both sets of Regulations were amended in 2016 to transpose the provisions of the updated Directive 2013/39/EU on Priority Substances and Directive 2014/80/EU which amends Annex II to Directive 2006/118/EC on the protection of groundwater against pollution and deterioration.

3.1.2 Legal framework for UWWTD implementation and associated actions

The Waste Water Discharge (Authorisation) Regulations 2007 (S.I. No. 684 of 2007) give effect to the requirements of the Urban Waste Water Treatment Directive (Directive 91/271/EEC) and the Water Framework Directive (2000/60/EC) in Ireland. The Urban Waste Water Treatment Directive lays down the requirements for the collection, treatment and discharge of urban waste water and specifies the quality standards which must be met - based on agglomeration size - before treated waste water is released into the environment.

The EPA is responsible for licensing and regulating urban waste water discharges. The authorisation process provides that the EPA must address the requirements of the Urban Waste Water Treatment Directive when granting a licence. Where necessary, the EPA must also specify a requirement for more stringent treatment on the basis of the 'combined approach' set out in Article 10 of the Water Framework Directive, if needed to address particular water quality needs such as protected area requirements (including bathing waters, shellfish growing waters or nutrient sensitive areas), or otherwise addressing water quality standards based on requirements or priorities established in river basin management plans.

Discharges from urban areas with a population equivalent of 500 or more require a waste water discharge licence, and discharges below this threshold require a certificate of authorisation. The EPA commenced the licensing of urban agglomerations in 2007 and has since granted 464 waste water discharge licences and 536 certificates of authorisation.² It is the responsibility of Irish Water to comply with the requirements of these licenses and authorisations.

There has been significant investment in urban waste water infrastructure over the period to the first cycle, supporting the achievement of requirements set out in the discharge licences or certificates of authorisation. Detailed information on past and projected future expenditure on water infrastructure is set out in Section 9 of this draft RBMP. In the period to 2014 the main vehicle for investment in waste water infrastructure was the Water Services Investment Programme of the DHPCLG (formerly the Department of Environment, Community and Local Government). For the period 2000-2013 a total of around €3.5bn was allocated to the waste water element of this capital investment programme, with €1bn of that expended over the period 2009-2013. This investment has resulted in significant improvements in waste water treatment over the period of the first cycle. For example, in 2009, 57% of agglomerations complied with the relevant requirements of the UWWTD with regard to the provision of secondary treatment, whereas in 2015 this had increased to 84% of agglomerations.

Whilst progress has been made, the need for further significant capital investment and operational improvements to fully address the requirements of the Urban Waste Water Treatment Directive (UWWTD) and progress towards the objectives of the Water Framework Directive is recognised. The setting up of Irish Water in 2014 represents an important development in this regard. Prior to 2014, water services in Ireland were delivered by 34 local authorities. This resulted in a fragmented approach to the delivery of water services infrastructure, uncertainty about funding and under investment over many decades. Irish Water was set up as a single national utility to address the identified shortfalls in water services infrastructure and to provide the opportunity to take a long-term view of water services at a national level. The approach is aimed at addressing funding shortfalls, ensuring resources are strategically targeted towards priority investment needs, and putting in place an approach towards investment in water services that gives the optimum balance between capital and operational spend to ensure the required delivery of services over time at least cost.

² Urban Wastewater Treatment in 2015, EPA (2016) <http://www.epa.ie/pubs/reports/water/wastewater/uwwreport2015.html>

3.2 Legal framework for Nitrates Directive implementation and associated actions

The Nitrates Directive, which aims to protect water against pollution caused by nitrates from agricultural sources, is the primary agricultural measure in place to support delivery of the WFD objectives. The Nitrates Directive is implemented in Ireland by the European Union (Good Agricultural Practice for the Protection of Waters) Regulations (S.I. No 31 of 2014). As Ireland chose to designate the entire territory as subject to the Nitrates Directive there is a basic level of protection for all waterbodies throughout the country. The principal elements of the GAP Regulations, which are delivered through the Nitrates Action Programme, are:

- limits on farm stocking rates
- legal limits on the application of nitrogen and phosphorus fertilisers
- maintaining buffer strips adjacent to watercourses where fertilisers cannot be spread
- 'closed periods' prohibiting the application of organic and chemical fertilisers during environmentally vulnerable parts of the season
- minimum storage requirements for livestock manures
- requirements regarding the maintenance of green cover in tillage lands; and
- maintenance of records relating to stock, land use and fertilisers brought onto the farm.

Co-ordinated implementation and information sharing is ensured through the Water Quality and Agriculture Working Group. The group meets on a quarterly basis and consists of representatives of DHPCLG, DAFM, the EPA and Local Authorities.

Primary responsibility for enforcement lies with the local authorities under the auspices of the DHPCLG. Local Authorities undertake 2,000 inspections each year on farms that have not previously been visited or have not been inspected in a number of years. In addition, around 1,500 follow up visits take place annually where minor non-compliance has been identified, to ensure the problems are corrected. DAFM has provided training to Local Authority staff to ensure there is a consistent approach to inspections across the whole country. In addition to these local authority inspections DAFM carry out a further 3,000 farm inspections – 1,650 of which relate to ensuring compliance with the Nitrates regulations and 1,350 which relate to cross compliance inspections. Finally, DAFM carry out administrative checks for all farms with regard to the livestock manure nitrogen limit laid down in regulation. The level of inspection is summarised in the table opposite:

Inspection Authority	Annual Inspections (farms)	Other inspections (farms)	Stocking rate check (farms)
Local Authorities	2,000	1,500	
DAFM	3,000		139,000

Table 3.1: Annual farm inspections in the Irish River Basin District

Based on these inspections, compliance rates are almost 70% - with the majority of non-compliance issues relating to management within the farmyard, meaning minor changes to farmyard management (e.g. cleaning up small spillages of silage or diverting clean water away from storage tanks) can increase compliance levels. These issues have been identified in an information booklet sent to farmers by DAFM in 2016 and future actions will aim to address this challenge. Furthermore, as DAFM is the paying agency for EU CAP funds, problems found during inspection by Local Authorities or other Departments or agencies are cross reported to DAFM and may result in a monetary penalty for the farmer involved.

The Nitrates Directive provides for an increase in the general stocking limit of 170 kg N per hectare where a Member State has agreed its Nitrates Action Programme with the EU Commission and can demonstrate compliance with specific conditions. The nitrates derogation is operated by the DAFM and is only available to grassland farms on an individual basis. The derogation is subject to strict conditions including mandatory soil sampling, the preparation of a nutrient management plan and the annual submission of fertiliser records. The number of approved derogations has grown from 4,133 in 2007 to 6,800 in 2016. DAFM carries out annual administrative checks on all derogation farms, and on-farm inspections on 5% of derogation farms. Levels of compliance on derogation farms are higher than on non-derogation farms and generally in the region of 85-90%.

Article 12 of Council Regulation (EC) No. 73/2009 requires Member States to set up a Farm Advisory System (CC-FAS) to advise farmers on meeting the cross compliance requirements including the Nitrates Directive. In keeping with this regulation Ireland has such a system in place since 2007. There are over 700 DAFM trained CC-FAS advisors in Ireland and these are an important support to aid farmer's compliance with regulatory requirements. This equates to 1 advisor for every 200 farmers. These advisors are paid by farmers to give advice regarding scheme applications and understanding regulatory needs.

These advisors are trained by DAFM annually, including with regard to cross compliance requirements under the GAP Regulations. Cross compliance inspections are a check to ensure farmers meet environmental, food safety and land management standards as set down in different EU and National legislation. Farmers must meet these standards in order to receive payment under the Basic Payment Scheme which is worth over €1 billion to Irish farmers annually. In some farming sectors aid received under the Direct Payment Scheme can make up the majority of a farmers income for the year. During annual training issues found on farms in the previous year are highlighted and the most recent training for advisors included a session on water quality delivered by the EPA to improve agricultural advisors understanding of the impact of nutrient losses from agriculture on water quality.

In addition to the GAP regulations there are a range of other agricultural support measures under Ireland's RDP and these are outlined under section 3.3 below.

3.3 Other measures for delivery of environmental objectives

In addition to the three measures above, a number of other measures were also in place or developed during the first cycle:

- Regulation of Domestic Wastewater Treatment Systems:** Regulations (SI 2033 of 2012) have been put in place governing the operation and maintenance of domestic wastewater treatment systems (DWWTSs). All domestic wastewater treatment systems require ongoing maintenance and desludging to ensure that the septic tank/treatment plant operates effectively and solids do not enter the percolation area and clog the distribution pipe work. These regulations require the owner to carry out such maintenance.

The EPA has been given responsibility for developing and implementing a National Inspection Plan to support these regulations. The first such plan "National Inspection Plan 2013: Domestic Waste Water Treatment Systems" was published in February 2013. The aim of the Plan is to protect human health and water from the risks posed by domestic waste water treatment systems by using a two-strand approach of education and awareness strategies linked with a risk-based inspection process. The Plan is delivered by Local Authorities and the number of inspections for each county is allocated on a risk basis – focusing particularly on areas where the potential risk to public health and protected water resources is higher. Published reports detail a total of 1,559 septic tank inspections took place over the period July 2013 to December 2014. Provisional data for 2015 indicates that 1,097 inspections were completed in 2015. Advisory notices were issued with regard to 489 systems which failed the inspection. To date 249 have implemented the required remedial measures and 240 notices remain open.
- Pesticides Regulations:** EU Regulation 1107 of 2009 concerning the approval and placing on the market of pesticides is directly applicable to all Member States. Ireland has provided further statutory standing through the Plant Products Regulations (SI 159 of 2012). In addition, the Sustainable Use of Pesticides Directive has been transposed into Irish law through the Sustainable Use of Pesticides Regulations (SI 155 of 2012). This provides for compulsory registration and training of professional users of pesticides (farmers and others) and for the application of buffer zones, in particular surrounding drinking water abstraction points. To date over 24,000 farmers have been trained. Since November 2015 all plant protection products must be applied by registered professional users (including farmers) and such users must have received suitable training and apply the principles of integrated pest management to ensure their appropriate usage. All sprayers must be tested and approved for use from Dec 2016 onwards, and in advance of this 4,000 sprayers have already been tested. Application restrictions concerning distances to waterbodies vary between different pesticide products depending on individual risk assessments. MCPA containing products cannot be applied within 5m of surface waterbodies, nor are applications on grassland permitted in the October to February period.

Environmental Impact Assessment (EIA) (Agriculture) Regulations: The Environmental Impact Assessment (EIA) (Agriculture) regulations came into force in September 2011 (SI 456 of 2011). These Regulations provide for an EIA screening and consent process for farmers with regard to three activities (i) restructuring of rural land holdings (ii) commencing to use uncultivated land or semi-natural areas for intensive agriculture and (iii) land drainage works on lands used for agriculture. Where a farmer intends to undertake any of these activities, and the proposed works a) exceed certain threshold values or b) the proposed works are to be carried out within (or may affect) a proposed NHA or a nature reserve, or c) the proposed works may have a significant effect on the environment, an application (giving details of the proposed work) to DAFM for screening is obligatory. There were a total of 629 such applications in the period 2009 to 2015. If the proposed works exceed the threshold for mandatory environmental impact assessment or DAFM, following screening, considers that the proposed works are likely to have a significant effect on the environment, work may not proceed without DAFM consent. These regulations offer protection for valuable features in the landscape not only for biodiversity but also for restricting the movement of water and hence can mitigate erosion and sedimentation.
- Rural Development Programme (RDP) and the Green Low Carbon Agri-Environment Scheme (GLAS):** The EU's rural development policy is intended to help the rural areas of the EU to meet the wide range of economic, environmental and social challenges of the 21st century. In Ireland funding of just under €4 billion is allocated for the 2014-2020 period (€2.19bn from EU budget and €1.73bn in national co-funding). A central priority of the Irish RDP is restoring, preserving and enhancing ecosystems related to agriculture and forestry.

Environmental Impact Assessment (EIA) (Agriculture) Regulations: The Environmental Impact Assessment (EIA) (Agriculture) regulations came into force in September 2011 (SI 456 of 2011). These Regulations provide for an EIA screening and consent process for farmers with regard to three activities (i) restructuring of rural land holdings (ii) commencing to use uncultivated land or semi-natural areas for intensive agriculture and (iii) land drainage works on lands used for agriculture. Where a farmer intends to undertake any of these activities, and the proposed works a) exceed certain threshold values or b) the proposed works are to be carried out within (or may affect) a proposed NHA or a nature reserve, or c) the proposed works may have a significant effect on the environment, an application (giving details of the proposed work) to DAFM for screening is obligatory. There were a total of 629 such applications in the period 2009 to 2015. If the proposed works exceed the threshold for mandatory environmental impact assessment or DAFM, following screening, considers that the proposed works are likely to have a significant effect on the environment, work may not proceed without DAFM consent. These regulations offer protection for valuable features in the landscape not only for biodiversity but also for restricting the movement of water and hence can mitigate erosion and sedimentation.

GLAS is a targeted agri-environment scheme under the RDP. It has a budget of €1.4 billion for 2014-2020, making it the largest scheme in the RDP. Currently there are 38,000 participants in the scheme. Once granted entry on this basis farmers are told which action is most appropriate to their farm and must take on measures such as fencing of watercourses (almost 13,000km to date) or catch crops (17,000 ha) which will protect and improve water quality. Catch crops for example can prevent the loss of up to 50kgs of nitrogen per hectare each year. Priority access has been given to farmers in high status water areas. All GLAS participants must engage a Farm Advisory Service advisor to draw up their application and prepare a nutrient management plan.

Also as part of the RDP increased manure/slurry storage has been an important supporting measure. Over the period 2006-08 the Farm Waste Management Scheme provided total grant aid of €1.2bn to approximately 43,000 farmers to enhance storage capacity. This resulted in a €2bn investment in manure/slurry storage facilities with a capacity 6 million m³. Over the period to 2013 the Targeted Agricultural Modernisation Scheme provided a budget of €90million to schemes such as providing loose housing for sows and putting in place additional storage for livestock manure beyond the regulatory level required. In addition the Rural Environment Protection Scheme (a whole farm approach to environmental protection) is estimated to have resulted in a spend of over €500 million on water quality measures including during the first cycle of the RBMP and the AEOS scheme (Agri Environment and Options Scheme) funded by modulated funds (negotiated as part of the CAP Health check), topped up significantly by Exchequer funding resulted in a spend of €226.3 million on water related measures during the last RBMP cycle. This scheme was the first time a targeted rather than a whole farm approach was taken in an agri-environmental scheme in Ireland.

- **Agricultural Catchments Programme:** This programme was established in 2008 to monitor the environmental and economic effects of Ireland's Nitrates Action Programme. It runs in four year phases to analyse the effectiveness of the measures and all findings are published in peer reviewed papers. It involves 6 catchments, with the voluntary engagement of over 300 farmers. There is evidence of significant beneficial change on many of the participating farms. Since the introduction of the GAP regulations it has been found that there have been declines in farm-gate N and P surpluses (of 14% and 50% respectively) and increases in N and P use efficiencies (of 2% and 18% respectively) across 150 specialist dairy farms. The change was driven by the reduced use of chemical N and P fertilisers and with improvements in milk solids output.

In terms of outcomes of the implementation of the Nitrates Directive in Ireland and the supporting measures outlined above, trends in the levels of nitrates in rivers, for example, show the positive impacts of these basic measures. EPA analysis of oxidised nitrogen trends over the period 2007-2015 find that 45% of monitored sites show improving trends and a further 53% have stable trends, with only 2% of monitored sites showing deteriorating trends. More specifically, for the monitoring period 2004-2006 6% of sites were above 25 mg/l NO₃ annual average, whereas by 2012 this had fallen to 1% of monitored sites³. However, phosphorus trends point more to stability with 62% of monitored sites showing stable trends over the period 2007-2015, 31% showing improvement and 4% of sites showing a deterioration over that period. Data from 2012 monitoring of orthophosphate levels in rivers shows that 15% of river sites were above 0.05 mg/l P compared to 21% in 2006.

3.4 Building on the First Cycle

This second cycle of river basin management planning aims to build on progress made during the first cycle to further progress towards the objectives of the WFD.

With regard to urban waste water pressures, as set out above, good progress was made during the first cycle, with significant investment yielding progress in terms of meeting required treatment standards. However it is fully recognised that to meet the requirements of the UWWTD and support the delivery of the WFD objectives, further investment is required over the period of this second cycle and beyond. The Irish Water Investment Plan sets out a clear pathway for the period of the second cycle, and the rationalisation of 31 individual water authorities (Local Authorities) into a single national authority will also continue to bring benefits in terms of efficiencies and the application of best practice.

Progress has been made during the first planning cycle with regard to achieving the protected areas objectives for bathing waters, shellfish waters and nutrient sensitive areas. As set out in detail later in this plan, future planned investment in urban waste water by Irish Water over the period of the second cycle will continue to contribute to further improvements for these protected areas over the period to 2021. However, the protection afforded to Natura 2000 sites is something which must be addressed in a more coherent manner during the second cycle. Specific measures for the protection of drinking water sources were not fully realised during the first cycle. This second cycle will set out measures towards the implementation of a comprehensive programme for the protection of drinking water sources, based on the World Health Organisation Drinking Water Safety Plan risk assessment approach.

³ Environmental Protection Agency, 2016. Unpublished Assessment – A focus on Nitrates and Phosphorus in Irish Waters - Report on Nitrate and Phosphorus in Irish Water. EPA, Johnstown Castle, Ireland.

The above sections also outlined progress in addressing pressures from rural diffuse pollution. The public consultation process highlighted the importance of addressing pollution from the agriculture sector, in particular in the context of the planned output growth envisaged in the Food Wise 2025 Strategy.⁴ Ensuring we build on the progress made to date in this area will be central to the success of this second cycle, as will ensuring that the output growth envisaged for the sector does not negatively impact on water quality, and that systems are in place to ensure any such risk is monitored and mitigated. Similarly, with regard to un-sewered waste water discharges, the successful implementation National Inspection Plan 2013 needs to be further built upon in subsequent plans out to 2021.

The issue of a decline in the number of high status waters has emerged as an important issue from the public consultation process – and is one that was not specifically addressed in the first cycle plans. There has been an overall decline in high quality rivers since monitoring began in 1987; from 30% of monitored waters in 1987 to 16% in 2009. The most recent data, presented in the next section shows that high status waters remain under pressure. There is now a recognised need, supported by the public consultation process, for a more comprehensive approach to the protection of high status waters. This will also form part of the overall programme of measures for the second cycle.

Another area where the need for improvement is recognised is with regard to communication and public engagement, and implementation and implementation structures. As previously noted, the public consultation process for developing this

draft RBMP has identified the need to improve approaches to, and structures for, communication and public and stakeholder engagement. Progress has been made on this issue with the new structures and processes put in place for preparation of this plan – however, there is a need to ensure that the structures and processes in place throughout second cycle continue to address the problems identified.

On the matter of implementation structures there is general acceptance that the governance arrangements put in place to deliver the first cycle of river basin management plans did not work well. Indeed, in assessing the first cycle of RBMP the European Commission observed that “there was no single body having ultimate responsibility” and also stated “fragmented institutional structures, poor intra and inter-institutional relationships and capacity” undermined the ability to both develop and implement plans. It is recognised that the arrangements for implementation and governance were overly-complex and responsibilities were poorly defined with no single body having overall responsibility for developing the plans and overseeing delivery of the programmes of measures. It is of central importance that the issues are addressed as part of this plan.

Finally a key learning from the first cycle is the need for an improved evidence base, and the need to use this evidence base to arrive at priorities and resultant ambitious but achievable targets. This is a central part of this second cycle plan, and one which will allow for more focussed implementation of measures over the period to 2021.



⁴ Food Wise 2025 The Report of the 2025 Agri-Food Strategy Committee <https://www.agriculture.gov.ie/foodwise2025/>

Section 4:

Current state of the water environment

This section provides an overview of how water quality in Ireland is monitored and assessed, and provides details of the most recent water quality results. The changes in status that have taken place over the period of the first cycle are also considered. The situation with regard to our protected areas, including water dependant special areas of conservation, is also set out, again including the most recently available information.

4.1 Assessing the condition of Irish waters

A comprehensive and representative environmental water monitoring programme was designed and implemented in Ireland (EPA, 2006) to support the implementation of the first river basin planning cycle. The monitoring programme provides the basis for describing the state of the aquatic environment, and for assessing the effectiveness of the programmes of measures in achieving the environmental objectives established through the river basin management planning process. While the Environmental Protection Agency has overall responsibility for the design and management of the monitoring programme, responsibility for certain elements has been assigned by the Agency to a number of public bodies, including local authorities, Inland Fisheries Ireland, the National Parks and Wildlife Service, Waterways Ireland and the Marine Institute.

For the purposes of the Water Framework Directive all waters have been grouped into types (e.g. different types of lakes) and further divided into individual management units called water bodies. These include 513 groundwater bodies, 3,192 rivers, 812 lakes (206 above 50 hectares), 194 transitional and 110 coastal water bodies. 34 of these are heavily modified water bodies. There are also 11 artificial water bodies.

The groundwater monitoring network consists of 336 monitoring sites. The river network consists of 3,191 monitoring sites covering 2,343 river water bodies. The lakes network consists of 216 lakes and 9 reservoirs. The transitional waters network consists of 80 monitored water bodies and the coastal waters network consists of 43 monitored water bodies.

Ireland has an extensive monitoring network by European standards, but nonetheless there are some areas where we do not have site-specific monitoring information, such as small coastal streams, remote upland lakes and offshore coastal water bodies, which means that the condition of the respective water bodies cannot currently be verified. In these areas, we have used our risk assessment process to identify the risks and what sort of action, if any, is required (See section on characterisation).

WFD classification for groundwater consists of quantitative status and groundwater chemical status. Each is assigned as either good or poor status.

WFD classification for surface water consists of ecological status and chemical status classification. These classification systems vary across rivers, lakes, transitional waters, and coastal waters. The quality elements relevant in assessing ecological status and ecological potential for surface waters include biological elements, water chemistry and the physical condition of water bodies.

Surface water bodies are assigned to one of five ecological status classes (high, good, moderate, poor or bad) or one of five ecological potential classes (maximum, good, moderate, poor or bad). The status assigned is determined by the status of the poorest quality element.

Full details of status assessments for previous periods are available on the EPA website, and the Water Quality in Ireland Report 2013-2015 will also be available in early 2017.⁵

4.2 The ecological status of waters and changes over the first cycle

A summary of status for all monitored waters in the 2013-2015 period is provided in Table 4.1 and Figure 4.1. A description in relation to the status in each water category and changes since 2007-2009 is also provided below.

Status of Irish waters (2013- 15) Number of water bodies (%)	High	Good	Moderate	Poor	Bad
Groundwater (based on 2010-15)	n/a	468 (91%)	n/a	45 (9%)	n/a
Rivers	243 (10.4%)	1045 (44.6%)	637 (27.2%)	412 (17.6%)	6 (0.2%)
Lakes	25 (11.1%)	78 (34.7%)	75 (33.3%)	28 (12.4%)	19 (8.4%)
Transitional waters	13 (12.9%)	19 (18.8%)	49 (48.5%)	15 (14.9%)	5 (5%)
Coastal waters	9 (23%)	22 (53%)	8 (19%)	2 (5%)	0 (0%)

Table 4.1: Summary of WFD water status for monitored groundwater and surface waters (ecological status) during 2013-2015.⁶

⁵ EPA Water Quality in Ireland reports: <http://www.epa.ie/pubs/reports/water/waterqua/>

⁶ These figures include 34 heavily modified water bodies (7 rivers, 16 lakes and 11 transitional waters)

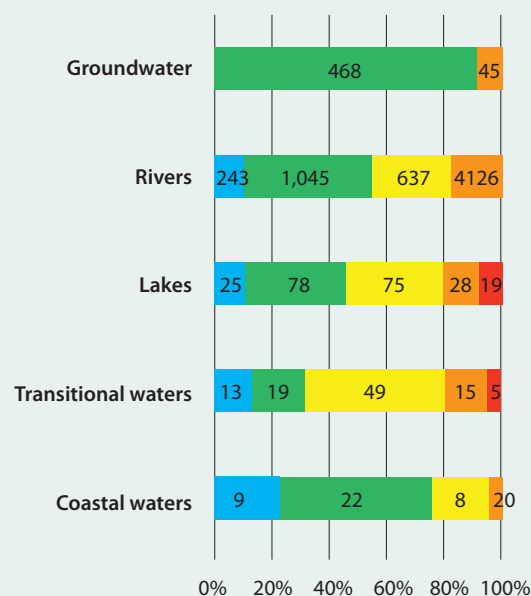


Figure 4.1: Surface water ecological status for rivers, lakes, transitional and coastal waters and groundwater status (2013-2015).

4.3 Heavily modified water bodies and artificial water bodies

The status of monitored Heavily Modified Water Bodies (HMWBs) and Artificial Water Bodies (AWBs) in the 2013-2015 period is summarised in Table 4.2.

Status of heavily modified & artificial water bodies (2013-2015) No. of water bodies	Maximum	Good	Moderate	Poor	Bad	Unassigned
Rivers	0	1	1	2	0	3
Lakes	0	6	2	1	0	7
Marine waters	0	1	8	0	0	2
Artificial water bodies (Canals)	0	9	1	1	0	0

Table 4.2: Summary of WFD status for Heavily Modified Water Bodies and Artificial Water Bodies (ecological potential) during 2013-2015.

Status assessment of HMWBs and AWBs is based on best available information. The basis for HMWB designation and ecological potential will be reviewed by the EPA during the second cycle to take improved hydromorphological assessment methods in account (see Section 7.6 which includes information on planned improvements in assessment methods for the physical condition of surface waters).

4.4 Waters that have improved or dis-improved

Nationally both monitored river water bodies and lakes at satisfactory ecological status (high or good) appear to have declined overall by 3% since 2007-2009. However, whilst the national figure of 3% suggests only a slight decline; this doesn't reflect a significant numbers of improvements and dis-improvements across monitored river water bodies and lakes since 2009. Provisional figures from the EPA suggests that approximately 900 river water bodies and lakes have either improved or dis-improved.

Preliminary assessment by the EPA indicates that increased phosphorus concentrations and/or siltation in rivers may be contributing to deterioration and that this is mainly associated with poorly drained soils. In the case of rivers that have improved, lower phosphorus concentration appears to be a factor. However, as these results have only recently become available further in-depth assessment is needed to understand the changes in status more fully.

A welcome development has been the reduction in the length of seriously polluted channel to 6 kilometres in the 2013 to 2015 period compared with 53 kilometres between 2007 and 2009.

Two large water bodies have been reclassified as less than good with the Lee (Kerry) estuary and Lower Shannon estuary being classified as moderate in the most recent period. This increases the area of transitional water bodies at less than good status substantially despite the overall negligible change in numbers of water bodies.

4.5 The continued long-term decline in high status river catchments

The previously observed long term trend of decline in the number of high status river sites is continuing (Figure 4.2). 18% of monitored river sites had high status in 2013-15 compared to 30% of monitored sites in 1987-1990. Q5 waters which represent the highest quality waters within the high status category have reduced to a very low number of 21 water bodies. When monitoring results are aggregated on a water body basis the percentage of high status water bodies has reduced from 13% in 2007-2009 to 10% in 2013-2015.

High Ecological Quantity (Q5 and Q4 - 5) River Sites Trend 1987 - 2015

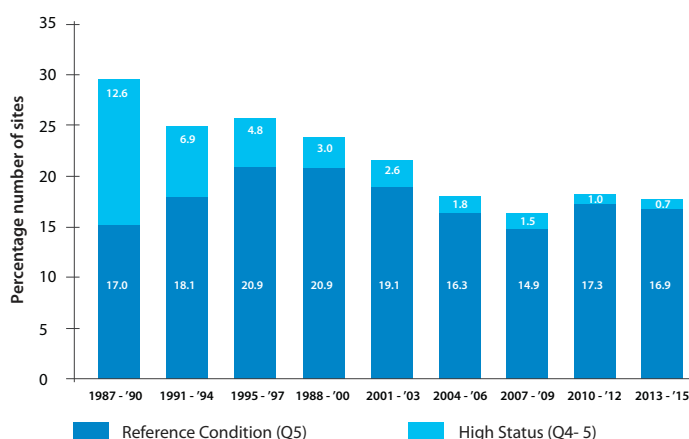


Figure 4.2: Observed long-term decline in the extent of high ecological quality river sites

4.6 Chemical status of surface waters

Surface water chemical status was assessed following analysis of the EU list of 25 priority and 14 priority hazardous substances from the national surveillance monitoring network. The surveillance monitoring network is a nationally representative network of surface water bodies and consists of 179 river water bodies, 76 lakes, 30 transitional water bodies and 12 coastal water bodies.

As expected, polyaromatic hydrocarbons (PAHs) and mercury did show widespread exceedances of the EQS at monitoring sites. However, these substances have been identified at EU level as ubiquitous and occur widely in the environment on a global scale, due principally to atmospheric deposition. These can be found for decades in the aquatic environment at levels posing a significant risk, even if extensive measures to reduce or eliminate emissions of such substances have already been taken. Some are also capable of long-range transport. Therefore, non-compliant results do not infer specific issues local to a water body or indeed river basin district.

When the widespread pollutants mercury and PAHs are excluded, only four (1.3%, two rivers, one lake and one transitional) of the 297 water bodies were at poor chemical status (Figure 4.3). Substances that have exceeded standards include naturally occurring metals (cadmium, lead and nickel), two pesticides (atrazine and simazine) and the plasticiser Di(2ethylhexyl)-phthalate (DEHP).

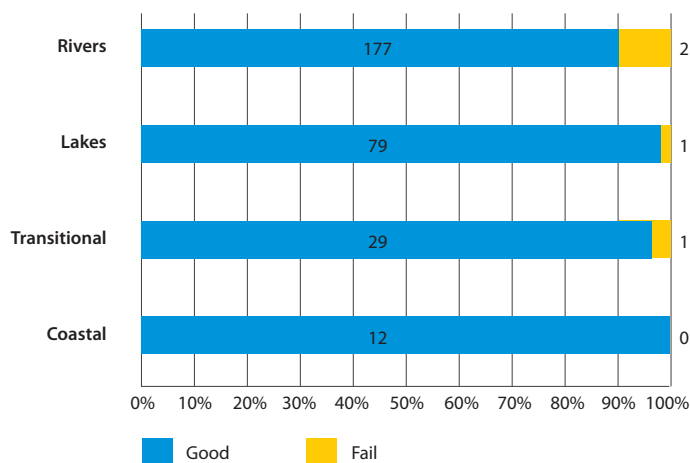


Figure 4.3: Chemical status of surveillance monitored surface water bodies for 2010-2015 period

4.7 The condition of water dependent protected areas

Protected areas are areas that have been designated as needing special protection because of their particular importance for use as bathing waters, drinking water supply, growing and harvesting of shellfish, conserving sensitive habitats and species or because they are particularly affected by eutrophication due to excessive inputs of phosphorus and/or nitrogen. The water related condition of these protected areas is set out below.

4.7.1 Bathing waters

The EPA publishes annual reports on "Bathing Water Quality in Ireland". These reports demonstrate that bathing water quality in Ireland has been of a consistently high standard over a number of years. In the latest published report for 2015, 128 out of a total of 134 or 93.4% of bathing waters met the EU mandatory values.⁷ Three quarters of bathing waters (101 of 137, 74%) were classified as being of 'Excellent' water quality. A further 13 (9%) were classified as being of 'Good' water quality. A summary of

the results showing compliance with EU mandatory values, for both freshwater and coastal locations, for the years 2010 to 2015 inclusive is presented in Fig 4.4.

Bathing water compliance 2010 - 2015

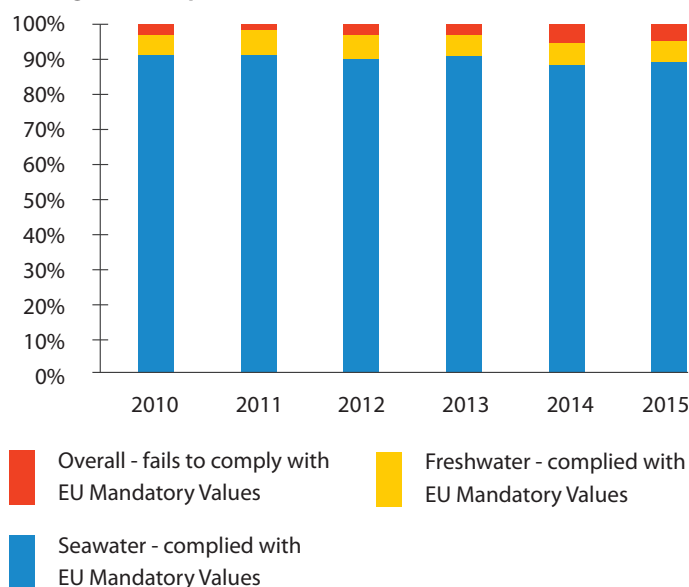


Fig 4.4: Bathing Water Quality in Ireland 2010 – 2015 ^a

4.7.2 Nutrient sensitive areas

EU member states are required under the Urban Waste Water Treatment Directive (UWWTD) (91/271/EEC) to identify nutrient sensitive areas. These have been defined as ‘natural freshwater lakes, other freshwater bodies, estuaries and coastal waters which are found to be eutrophic or which in the near future may become eutrophic if protective action is not taken’. Assessments are carried out on waters downstream of urban wastewater discharges from agglomerations above a population equivalent (PE) of 10,000. By 2015 23 out of a total of 26 agglomerations over 10,000 PE discharging to freshwater sensitive areas had treatment to remove phosphorus in place (Table 4.3). In the case of discharges to sensitive marine waters 16 were discharging to sensitive waters and only 3 had the necessary treatment in place to reduce nutrients in 2015.

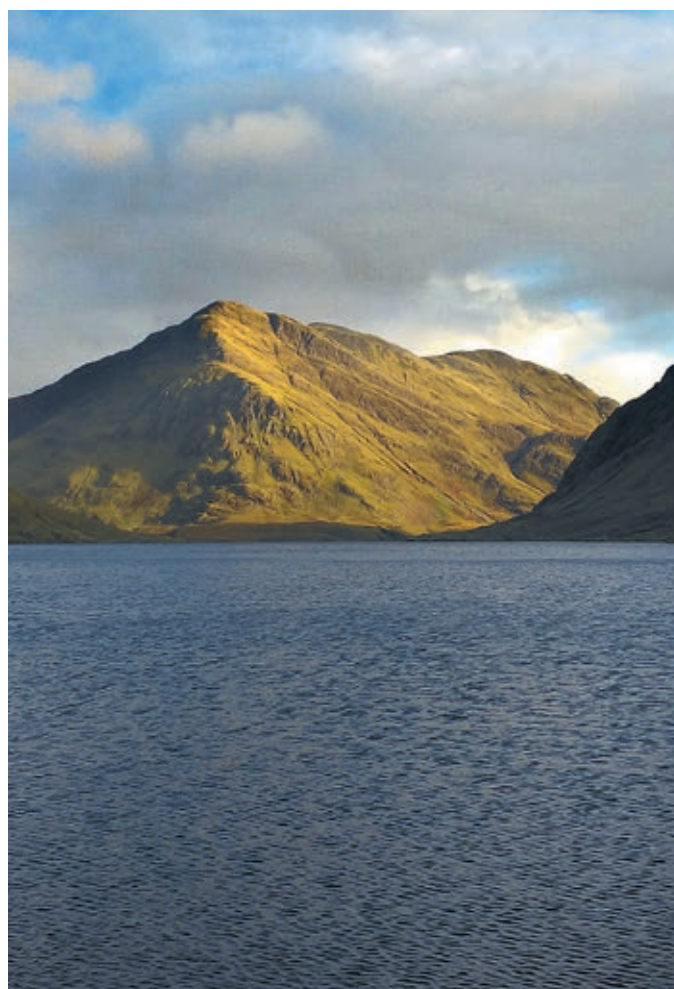
The EPA recently carried out a review of nutrient sensitive areas. 72 waste water discharges with PE above 10,000 were identified and waters downstream assessed. Of the 72 agglomerations, 47 were identified as having areas downstream showing evidence of nutrient sensitivity.

Agglomerations discharging to freshwaters or marine waters	No. identified as requiring more stringent treatment (following the 2010 review)	No. with more stringent treatment in place by 2015 and achieving required effluent standards
Freshwaters	26	23 (88%)
Marine waters	16	3 (19%)

Table 4.3: UWWT agglomerations discharging to nutrient sensitive freshwaters or marine waters with more stringent treatment in place and meeting the required standards

^a Bathing Water Quality in Ireland 2015, EPA (2016) <http://www.epa.ie/water/wm/bathing/>

^b Note: The method for assessing bathing water compliance changed in 2011 (SI 351 of 2011)



4.7.3 Drinking water protected areas

The Water Framework Directive requires the identification of Drinking Water Protected Areas (DWPAs). These are lakes, reservoirs, rivers and groundwater bodies from which water is abstracted to provide water for people to drink. Where necessary this raw water is treated to purify it to the required drinking water standard. In order to protect water from contamination from substances leading to the need for more treatment the risks need to be identified.

Information in the EPA Drinking Water Report for Public Supplies 2015 and other supplementary information was examined. With regards to the quality of drinking water following treatment over 99% of samples complied with microbiological and chemical standards. The Water Framework Directive requires that waters used for the abstraction of drinking water are protected so as to avoid deterioration in quality. For the purpose of identifying at risk drinking water protected areas, levels of pesticides and nitrates were assessed. 61 out of a total 1,277 public water supply sources indicated elevated levels of pesticides and 3 sources indicated elevated levels of nitrate. Elevated levels of these substances can also indicate the potential presence of other polluting substances.

4.7.4 Shellfish waters

In Ireland, 64 areas have been designated as shellfish waters (S.I. No. 268 of 2006, S.I. No. 55 of 2009, S.I. 464 of 2009). With regard to water quality standards average dissolved concentrations for metals complied with the Environmental Quality Standards for the period 2009-2015. While average total chromium concentrations were elevated at four locations (Sneem/Ardgroom, Valentia River, Bruckless, and Gweedore Bay), this was because of a single extreme value recorded in each case.

With regard to microbiological quality, overall achievement of the guide E. Coli value was relatively stable throughout the 7 year assessment period (2009-2015) (Figure 4.5).

Between 2009 and 2015 the areas most frequently not meeting the guide value were: Adrigole Harbour, Bannow Bay, Bantry, Cork North Channel, Cromane, Gweedore Bay, Kinsale, Loughras Beg, Tralee Bay and Wexford Harbour (inner and outer).

Shellfish Water Results

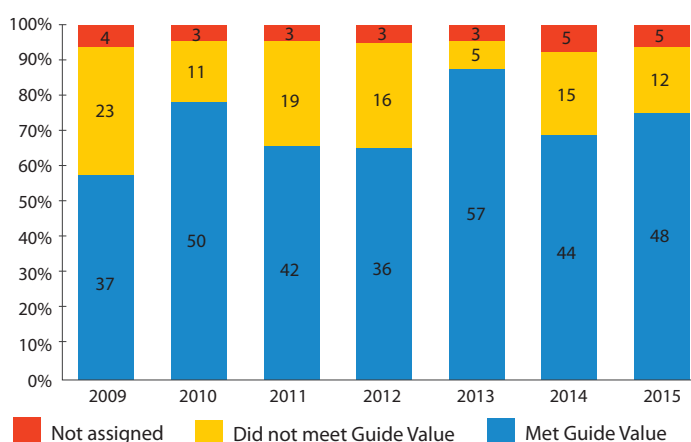


Figure 4.5: Numbers of designated shellfish waters meeting the E. coli guide values on an annual basis.

4.7.5 Protected water dependent habitats and species

Ireland has identified 430 candidate Special Areas of Conservation (SACs), of which, 358 (83%) contain at least one water dependant feature, i.e. water dependent habitats and/or water dependent protected species. There are 44 different water dependent habitat types and 22 water dependent species that have been identified by NPWS. Five of these water dependent habitats (11%) are deemed to be at Favourable Conservation Status, while eleven water dependent species (50%) are at Favourable Conservation Status ⁹ (Figure 4.6).

Suitable supporting water conditions, as well as other factors, are needed to ensure that these protected interests achieve Favourable Conservation Status. Where specific supporting water conditions (e.g. water quality, hydrological, morphological conditions) have not been specifically defined by NPWS it has been assumed that good ecological status is sufficient to support Favourable Conservation Status for the purpose of the second river basin planning cycle. In the case of protected Freshwater Pearl Mussel areas, high ecological status is needed. Additional water quality criteria and/or more stringent criteria may be defined in the future for particular habitats and species. For the purpose of this plan two habitat types (marl lakes and oligotrophic lakes) have been identified for further investigation (see section on measures for Natura 2000 sites).

Protected water dependent habitats and species are present in 849 river water bodies, 214 lakes, 128 transitional water bodies and 80 coastal water bodies. Just over half (51%) of these water bodies are monitored for WFD purposes. Of these, 60% (321) of river water bodies, 69 % (11) of lakes, 37% (22) transitional water bodies and 76% (28) of coastal waters met their respective good or high status requirements in 2015. (Figure 4.7). This indicates that supporting water conditions are more likely to be met in lakes and coastal waters, but that greater improvements are needed in river water bodies and transitional waters known to contain such features.

With regard to the Freshwater Pearl Mussel there are 27 designated populations, all of which are at Unfavourable Conservation Status. Of these, the top eight, which represents 80% of the total population and includes those with the best chance of recovery, have been prioritised for action ¹⁰. These priority populations are present in 28 river water bodies, of which 12 (43%) had met their high status target in the 2013-2015 monitoring cycle.

Groundwater Dependent Terrestrial Ecosystems (GWDTEs), such as fens, turloughs and bogs, have been assessed as part of the River Basin Characterisation and Classification assessment process. Of 63 GWDTEs failing their conservation objectives, groundwater was judged to be a contributing factor for 29 of these. Of these 29, 3 were confirmed as being *At Risk*, and the remaining 26 are under *Review*.

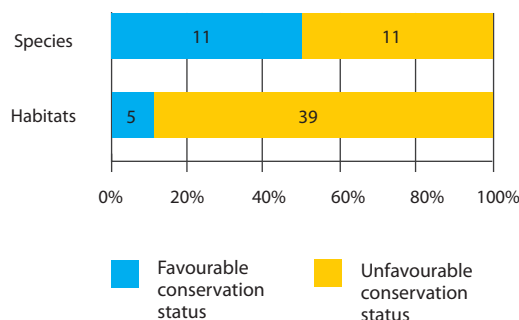


Figure 4.6: Numbers of designated Natura 2000 water dependent species and habitats meeting their conservation objectives (2013-2015)

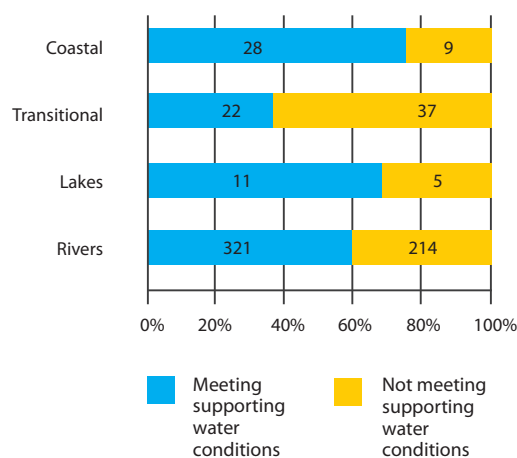


Figure 4.7: Numbers of monitored water bodies containing water dependent species and habitats meeting supporting water conditions (2013-2015)

⁹ The Status of EU protected Habitats and Species in Ireland, NPWS (2013), <https://www.npws.ie/article-17-reports-0>

¹⁰ A Strategy for Conservation of the Freshwater Pearl Mussel in Ireland, NPWS (2011)

Section 5: Catchment characterisation & environmental pressures on the water environment

An important part of developing this draft river basin management plan is to understand the pressures impacting on water status so that measures can be identified and implemented to manage those pressures. The catchment characterisation process, undertaken by the EPA with the assistances of a range of public bodies, assesses the risk of water bodies not meeting the requirements of the Water Framework Directive, and identifies the significant pressures on each water body that is at risk of not meeting its objectives. This work has been completed for 81% of water bodies to-date and will continue throughout 2017.

5.1 Risks to water bodies

A substantial body of work has been completed by the EPA, in conjunction with local authorities, Inland Fisheries Ireland (IFI) and Irish Water, to assess the significant pressures on waters on a variety of geographic scales over the past two years (waterbody, sub-catchment and catchment). This work is well progressed with work on waterbody and sub-catchment scale substantially completed with work at a catchment scale still to be undertaken in 2017 to inform the final plan. This will include integration of transitional waters and groundwaters into the assessment.

The previous chapter described the status of water bodies in Ireland based on the assessment of conditions compared against environmental standards established in legislation. For the purpose of managing pressures impacting on water status so as to achieve the environmental objectives established for water bodies, an assessment of the risks to water bodies has been undertaken by the Environmental Protection Agency with the assistance of a range of public bodies. Aquatic ecosystems can be damaged or degraded by a wide variety of environmental pressures which arise either from human activities undertaken in specific locations (point sources of pollution such as farmyards, wastewater treatment plants, septic tank systems) or widely dispersed human activities (diffuse sources such as land-spreading of fertilizers and surface run-off in urban areas). The key goal of the characterisation process is to identify those water bodies and protected areas which require action to meet the relevant objectives and to also identify the significant pressures impacting on those water bodies. This provides important information needed to inform the development of a programme of measures, and to allow a realistic and achievable RBMP to be developed and implemented.

The risk assessment approach considered the linkages and dependencies between the sources of environmental pressures, and the pathways linking those pressures to the receptors, such as rivers, lakes or groundwater. The assessment included examining the evidence from the monitoring data from 2007-2015, including review of the trends over time to see if conditions were likely to remain stable, improve or deteriorate by 2021. Account was taken of the sensitivity of some water-based ecosystems to nutrients and/or sediment and/or water abstraction arising from human activities, and of physical alterations to surface waters, such as dredging, river bank works and channelisation, which can also damage aquatic ecosystems. Models were used to help determine the most important environmental issues and pressures in each sub-catchment and to identify the key areas to target to achieve improved outcomes. Evidence and expertise from a range of public bodies has also informed the process. The outcome of these assessments is helping to inform the setting of objectives for water bodies and the measures that need to be taken to achieve those objectives.

5.2 National overview of risk assessment

Across all five water categories, the characterisation process has shown out of a total of 4,775 water bodies assessed to date that:

- 1,945 (41%) fall within the *Not at Risk* category, that is they are consistent with achieving the requirements of the directive and meeting their environmental objective of good or high status.
- 1,517 (32 %) are *At Risk* of not meeting their environmental objective of good or high status and
- 1,313 (27%) are currently under *Review*.

Table 5.1 provides statistics on the risk categories on a national basis for river, lake, groundwater, transitional waters and coastal water bodies

Water Body Type	At Risk		Review		Not at Risk	
	WB No.	WB %	WB No.	WB %	WB No.	WB %
Rivers	1213	38	775	24	1204	38
Lakes	147	18	267	32	408	50
Transitional	68	38	54	31	55	31
Coastal	17	24	37	52	17	24
Groundwater	72	14	180	35	261	51
Total	1517	32	1313	27	1945	41

Table 5.1: Summary of the Groundwater and Surface Water Body Risk Assessment

5.2.1 Water bodies for which the objective is High Status

Nationally, there are 381 river, lake, transitional and coastal water bodies that have a High Status Objective. These include 28 river water bodies in the catchment areas of the eight priority Freshwater Pearl Mussel Rivers. 226 water bodies (60%) are currently meeting this Objective and therefore are Not at Risk. 11 (3%) of water bodies are at *Review* and 138 (36%) water bodies are *At Risk* of not meeting their high status objective and require further action.

Water Body Type	No. of High Ecological Status Objective WBs	At Risk		Review		Not At Risk	
		WB No.	WB %	WB No.	WB %	WB No.	WB %
Rivers*	320	116	36	6	2	198	62
Lakes	37	14	38	0	0	23	62
Transitional*	19	7	37	4	21	2	11
Coastal	5	1	20	1	20	3	60
Total	381	138	36	11	3	226	60

* There are currently 6 transitional water bodies where a risk assessment is not yet completed and further assessment is required.

Table 5.2: Summary of Surface Water Risk Assessment for High Ecological Status Water Bodies

5.2.2 Water Dependent Protected Areas in Specials Areas of Conservation

Water dependent Special Areas of Conservation (SACs) requiring a high status objective have been addressed in the previous section. Other water dependent protected areas are addressed below. Surveys carried out by the National Parks and Wildlife Service have informed EPA analyses that identifies that water dependent protected habitats and species qualifying interests are present in a total of 1,158 surface water bodies. 43% of these water bodies are meeting their good status environmental objective and therefore are Not at Risk; 31% require additional monitoring and/or assessment and are in Review; while 24% of these surface water bodies are At Risk of not meeting their environmental objectives. This equates to 209 river water bodies, 8 lake water bodies, 47 transitional water bodies and 12 coastal waters where further/additional action is required (Table 5.3).

Water Body Type	No. of Protected Area WBs	At Risk		Review		Not At Risk	
		WB No.	WB %	WB No.	WB %	WB No.	WB %
Rivers	751	209	28	270	36	272	36
Lakes	208	8	4	53	25	147	71
Transitional*	117	47	40	16	14	42	36
Coastal*	82	12	15	21	26	38	46
Total	1158	276	24	360	31	499	43

* There are 11 coastal and 12 transitional water bodies where a risk assessment has not yet been completed and further assessment is required.

Table 5.3 Summary of Surface Water Body Risk Assessment for Water Dependent SACs

5.2.3 Assessing risk in waters not covered by the national monitoring programme

As previously stated Ireland has an extensive monitoring network by European standards. There is a proportion of water bodies where we do not have site-specific monitoring information, such as small coastal streams, remote upland lakes and offshore coastal water bodies. However, we have used our risk assessment process to identify the risks.

Figure 5.1 shows the risk categories identified for unmonitored water bodies. Unmonitored water bodies that are evaluated as

being *Not at risk* have no significant environmental pressures associated with them and so no further action is necessary. In the case of coastal waters and groundwater a large proportion are not at risk (59%-64%). A large proportion of unmonitored river water bodies require *Review* (66%). For unmonitored lakes, 52% are considered to be *Not at Risk* while 47% require *Review*.

These water bodies are being considered as part of the current monitoring programme

review, for additional monitoring and assessment to confirm the water quality issues and identify appropriate measures.

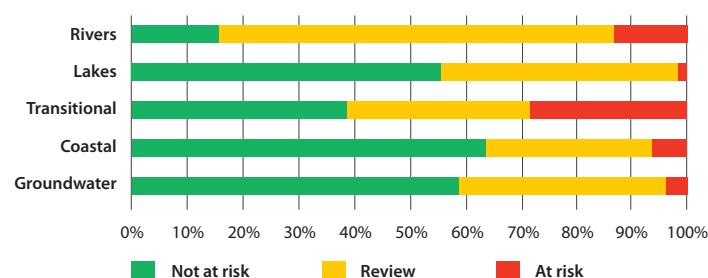


Figure 5.1: Risk assessment outcomes for water bodies without water body specific monitoring data (2013-2015).

5.3 Assessment of significant environmental pressures

5.3.1 Overview of Assessment

Having identified those groundwater and surface water bodies At Risk of not meeting their objectives by 2021, detailed assessments were undertaken by the EPA to identify the likely significant pressures preventing the water bodies from achieving the required environmental objectives. Significant pressures are those that either cause or are likely to cause an unsatisfactory water body status and which therefore need measures to be undertaken to mitigate the impacts(s).

These assessments are based on over 142 national datasets comprising information on pressures, impacts and physical settings. In addition, Local Authorities and Inland

Fisheries Ireland provided local knowledge and information which was incorporated into the assessment. In total, 13 pressures were considered – brief details on the information used in the assessment of pressures are given in Table 5.4.

Information used in the assessment of environmental pressures at water body level for rivers and lakes

- 1 Agriculture**
Evaluation of agriculture as a significant pressure involved the following: checking for water quality indicators, such as the presence of high phosphate concentrations; evaluating the presence of surface flow pathways for nutrients and sediment to rivers and lakes such as poorly draining soils and subsoils, and for underground pathways based on aquifer and groundwater vulnerability maps; use of maps showing critical source areas for phosphate loss to water (these are based on estimates of the nutrient load applied to land by farmers and the land drainage characteristics); and information from the EPA source load apportionment model which estimates the proportion of the catchment's nutrient load that can be attributed to each human activity.
- 2 Domestic Waste Water Systems**
The information used in assessing the impact of domestic waste water treatment systems were: landscape drainage characteristics (based on soils, subsoils and bedrock maps) indicating percolation conditions; the locations and densities of houses particularly in areas with poor drainage characteristics; and local authority information from inspections.
- 3 Urban Waste Water**
Information available on discharges from urban wastewater treatment systems was used as the basis for assessing their impact, such as the Annual Environmental Reports submitted by Irish Water to the EPA, data and information from EPA licensing and enforcement teams, and upstream and downstream ambient monitoring data for many plants. In addition, the EPA source load apportionment model results enabled the proportion of the nutrient load in rivers arising from plants to be considered.
- 4 Urban Runoff**
Urban runoff (i.e. misconnections from private foul connections to storm sewers, leakage from sewers and runoff from paved and unpaved surfaces) was categorised as a significant pressure where there were monitoring data for upstream and downstream of the urban areas, and where there were additional local authority and Inland Fisheries Ireland data and on-the-ground knowledge.
- 5 Forestry**
The impact of forestry was assessed using sediment and nutrient water quality monitoring data; aerial photography to check for new plantations and recent clear felling; Forest Service and Coillte forestry mapping; soil drainage characteristics that could facilitate runoff of sediment; and clear felling license applications.
- 6,7,8 Extractive Industry, Industry, Waste**
Assessment of these pressures used the following information: maps showing locations of EPA licensed sites and relevant Local Authority Section 4 discharges to water; aerial photography; peat extraction maps; information from EPA licensing and enforcement teams including Annual Environmental Reports submitted to the EPA; local authority Section 4 discharge monitoring data; and hydrochemistry data as an indicator for a particular pressure, for example ammonium which is often present in water in peatland areas.
- 9 Invasive Species**
The impact of invasive species was not assessed in detail as the available information is limited. However, information on their presence at EPA biological monitoring sites and data from the local authority and Inland Fisheries Ireland were used.
- 10 Physical Modification**
Assessing the significance of physical modification pressures involved consideration of available biological and hydromorphological (physical condition) evidence of impact based on monitoring information. This included information on fish status, River Hydromorphological Assessments (River-HAT), Q-values and siltation levels. The assessment examined the likely causes of observed impacts including the presence of channel modifications (e.g. arterial drainage and embankment works), land drainage schemes, deforestation activities and barriers to fish migration based on available maps and aerial photography. This was also supplemented by local knowledge provided by local authorities and Inland Fisheries Ireland.
- 11 Abstractions/Diversion**
A detailed quantitative assessment of possible impacts was undertaken by EPA where abstraction amounts were compared to estimated natural water flows / levels. In addition, biological monitoring data, the recently collated EPA Abstractions database containing locations and abstraction volumes for surface and groundwater abstractions and local authority and Inland Fisheries Ireland data and information were evaluated.
- 12 Historically Polluted Sites**
Evaluation of these sites was based largely on groundwater monitoring data for the specific pollutants likely to arise and from upstream and downstream chemical and biological monitoring data, as well as maps showing locations of EPA surrendered waste licenses sites.

Table 5.4: Information used in the assessment of environmental pressures at water body level for rivers and lakes

5.3.2 River and Lake Water Bodies: Significant Pressures

Identification of the significant pressures provides the means to target local measures, as well as providing a picture at national level to inform overarching measures and national policy requirements. In the 39 catchments assessed to date, 1,134 river and lake water bodies are *At Risk* of not meeting their environmental objective. The assessment of risks and pressures has helped to inform the formulation of measures contained in this draft river basin management plan. Figure 5.2 below, shows the frequency of significant pressures causing river and lake water bodies to be *At Risk*.

Of 1,134 river and lake water bodies that are *At Risk*, there are a total of 1925 individual significant pressures potentially impacting on these water bodies. Of these, 529 (47%) are impacted by a single significant pressure, while the remaining 605 (53%) water bodies are impacted by more than one significant pressures.

Significant Pressure In At Risk River and Lake Water Bodies

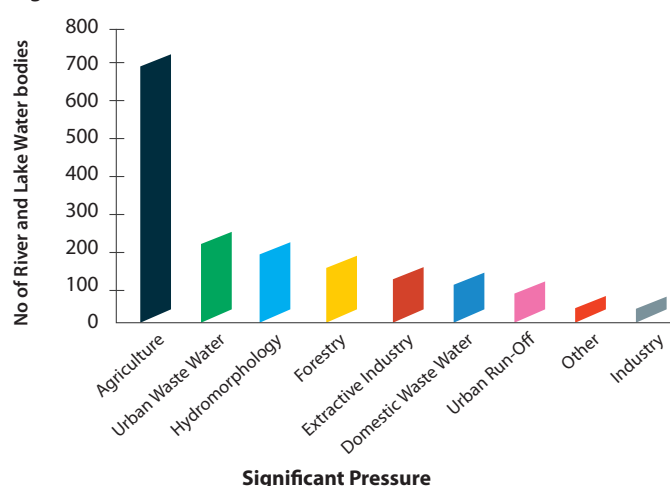


Figure 5.2: Likely significant pressures in At Risk river and lake water bodies based on risk assessments carried out to date (Note: Abstraction pressures are not included here and are addressed separately below)

Agriculture has been identified as a significant pressure in 729 (64%) river and lake water bodies that are *At Risk* of not meeting their environmental objective. Impacts are evident in all catchments but are most prevalent in the eastern half of the country, particularly in areas where there are poorly drained soils and subsoils, for example, Cavan, Monaghan, Meath (Figure 5.3a). The pressures relate to diffuse run-off of nutrients and sediment from land, and point source pollution associated with farmyards.

Urban waste water is a significant pressure in 248 (22%) river and lake water bodies at risk. Storm water overflows are believed to be impacting on 22 water bodies (2%). It should be noted that many water bodies contain multiple Urban Waste Water Discharges of differing agglomeration size. The distribution of urban waste water treatment plants are largely focused in the eastern half of the country and are coincident with higher population centres (Figure 5.3b).

Hydromorphology is a significant pressure in 220 (19%) water bodies at risk. The pressure relates to physical modification or damage to habitat and natural river/lake processes and functions caused by channelization, land drainage, dams, weirs, barriers and locks, overgrazing, embankments and culverts. A spatial pattern is

less evident given the variety of issues causing hydromorphology to be a significant pressure (Figure 5.3c). It is anticipated that as our knowledge and understanding of hydromorphological pressures improves, so too will the extent of the impacts across the country.

Forestry is a significant pressure in 183 (16%) water bodies at risk and the pressure is largely associated with clearfelling, drainage, and planting and establishment. The significant pressure is predominantly located in catchment headwaters and often coincident with catchment boundaries (Figure 5.3d).

Peat extraction has been identified as causing a significant risk to ecological status objectives in 112 waterbodies (10% of all waterbodies that have been determined as being at risk) (Figure 5.3e). The environmental impacts generally relate to suspended solids, ammonia and hydromorphological alterations. There is evidence that high levels of ammonia are being released from peat extraction activities during the draining process and may be causing ecological impacts in receiving waterbodies. The EPA plans to investigate the background concentrations of ammonia in peatlands to determine if they can be a contributory factor in elevated ammonia concentrations in waterbodies.

Domestic waste water include septic tank systems associated with one off housing and unlicensed private urban waste water treatment plants, and is a significant pressures in 138 (12%) water bodies at risk.

Urban run-off relates to a mixture of misconnections, leakage from sewers, and runoff from paved and unpaved areas and is a significant pressure in 112 (10%) water bodies at risk.

Invasive Alien Species (IAS) are non-native species introduced outside their natural range that threaten ecosystems, habitats and native species with environmental or socio-economic harm. Currently 37 species have been identified across the EU as a high priority for management, 9 of these occur in Ireland. The river basin public consultations on significant water management issues in 2015 identified invasive alien species as a significant issue for water management. For example, two species that pose a threat to aquatic ecosystems when present in riparian zones – Japanese Knotweed and Himalayan balsam – have been recorded throughout a significant proportion of the country-side by the National Biodiversity Centre.

Industry is a significant pressure in 69 (7%) water bodies at risk and includes IPPC (17) and IE (15) facilities licensed by the EPA and industry with a Section 4 Discharge to Water licenses (39) issued by Local Authorities.

Water abstraction refers to the taking of water from a surface water or groundwater body, either permanently or temporarily (for example, water diverted for hydropower generation). Abstraction of water can involve pumping, piping, diverting water into a reservoir, or sinking a borehole or well. Water is abstracted for many uses including public and private drinking water supply, industrial use, use in the food and drink industry, hydro-power generation, agricultural and agri-industry use, recreational use (such as golf courses) and for use in fisheries.

The overall potential impact on the supporting flow and level conditions for rivers and lakes that is posed by known water abstractions was low. This supports the findings of the assessments undertaken in 2008 for the first river basin management planning cycle. Nationally, 98 (3%) river water bodies and 73 (9%) lakes were identified for further assessment as potentially there may be a risk of water abstractions impacting on the supporting flow and level conditions needed to support the river and lake ecology. There are 62 groundwater abstractions (associated with 19 abstraction schemes/activities) being taken from 23 (4%) groundwater bodies that have also been identified where these abstractions may potentially pose a risk to the flow conditions needed to support the ecology in an adjacent river.

It should be noted that these assessments are conservative as they relate to potential impact. The actual level of impact on the river or lake ecology is likely to be less. All of the above 194 identified water bodies with abstractions require further assessment to confirm if the abstractions are in fact contributing to an ecology impact in the river and lake water bodies. This will be achieved by improving estimates of flow in these water bodies, undertaking more detailed assessment where the flow is regulated e.g. controlled by dams and an examination of available ecological monitoring information.

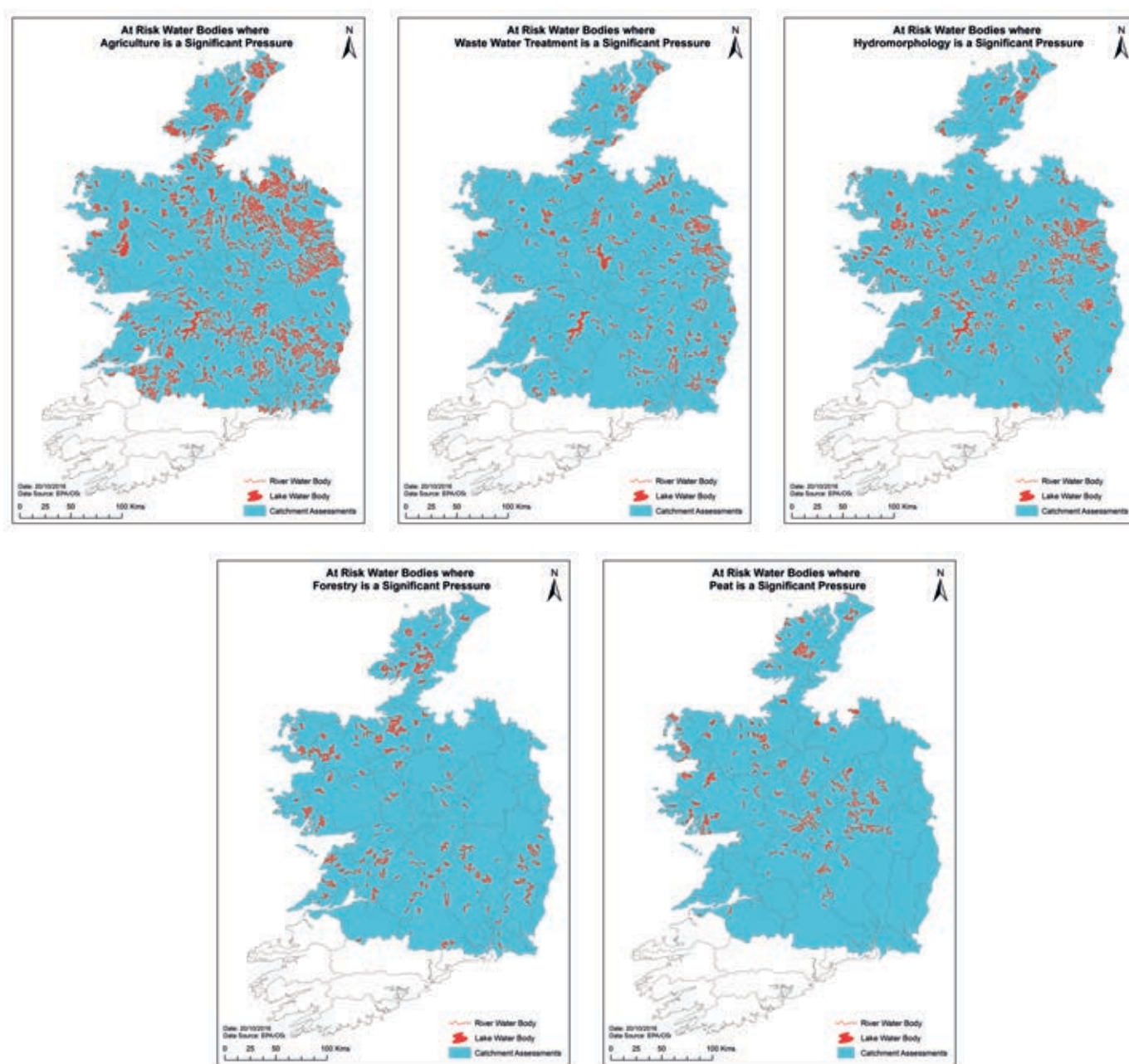


Figure 5.3: Maps showing location of significant pressures for a) Agriculture, b) Urban Waste Water, c) Hydromorphology, d) Forestry and e) Peat extraction. (Note: These are based on risk assessments completed to date).

5.3.3 High Ecological Status Water Bodies: Significant Pressures

130 river and lake water bodies are *At Risk* of not meeting their high ecological status objective. The risk profile is different to the general risk profile across water bodies nationally. Forestry is a significant pressure in 40 (31%) water bodies, followed by agriculture in 35 (27%) water bodies, hydromorphology in 27 (21%) water bodies, extractive industry (peat) in 21 (16%) water bodies and domestic waste water in 10 (8%) water bodies (Figure 5.4).

Significant Pressures on River & Lake Water Bodies with High Status Objective

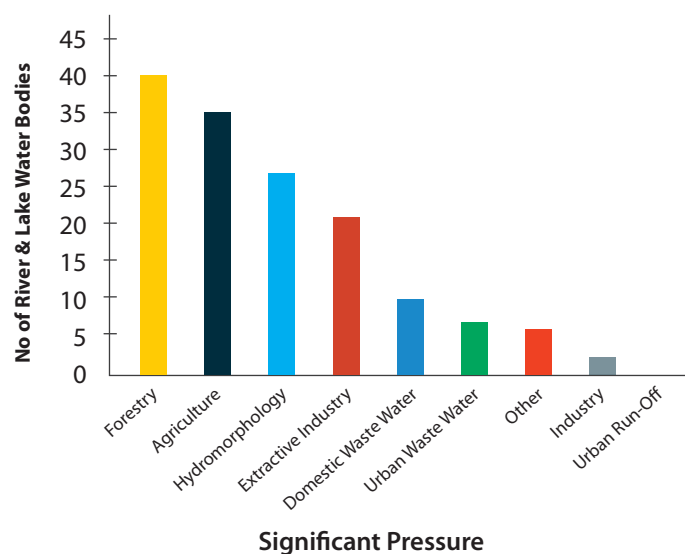


Figure 5.4 Significant Pressures on River & Lake Water Bodies with high status objective

5.3.4 Water Dependent Protected Areas in SACs: Significant Pressures

217 river and lake water bodies are *At Risk* of not meeting their good ecological status objective. The risk profile is similar to the general risk profile across water bodies nationally. Agriculture is a significant pressure in 106 (49%) water bodies, followed by Urban Waste Water in 43 (20%) water bodies, hydromorphology in 24 (11%) water bodies, domestic waste water in 23 (11%) water bodies, forestry in 23 (11%) water bodies, urban run-off in 22 (10%) water bodies and extractive industry in 20 (9%) water bodies (Figure 5.5).

Significant Pressures on River & Lake Water Bodies in Water Dependent Protected Areas

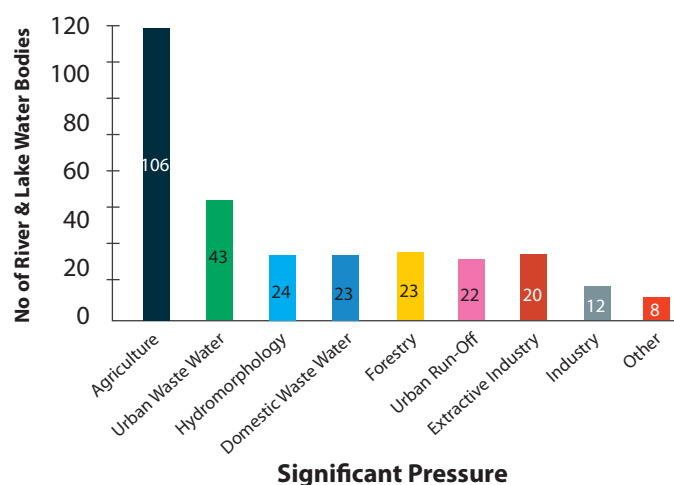


Figure 5.5 Significant Pressures on River and Lake Water Bodies in Water Dependent SACs

Section 6:

Environmental Objectives of the WFD & priorities for this Plan

The Water Framework Directive (WFD) itself sets out the environmental objectives which are required to be met through the process of river basin planning and implementation of those plans. Specific objectives are set out for surface water, groundwater and protected areas. The challenges presented in achieving the objectives are very significant, and therefore a key purpose of this draft RBMP is to set out priorities and ensure that implementation is guided by this prioritisation.

6.1 Environmental objectives set out in the WFD:

Article 4 of the WFD sets out the full detail of the environmental objectives of the Directive, the application of the objectives, and possible exemptions the objectives, however, in summary, the general thrust of those objectives is:

For Surface Waters:

- To prevent deterioration of the status of surface waters
- To protect, enhance and restore surface waters with the aim of achieving good status (ecological and chemical) for all water bodies
- For heavily modified water bodies and artificial water bodies, the aim is to protect and enhance those bodies to achieve good ecological potential and good chemical status
- To progressively reduce pollution from priority substances and cease or phase out emissions, discharges and losses of priority hazardous substances into surface waters

For Groundwater:

- To prevent deterioration of the status of groundwater
- To protect, enhance and restore all bodies of groundwater, and ensure a balance of abstraction and recharge, with the aim of achieving good groundwater status (quantitative and chemical)
- To reverse any significant and sustained upward trends in the concentration of pollutants in groundwater

For Protected Areas:

- To achieve compliance with objectives and standards under which the individual protected areas have been established.

6.2 Prioritisation for the second cycle RBMP:

Whilst the objectives of the Directive clearly set out the end goals, the challenges presented in achieving these objectives are very significant. Therefore, a key purpose of this plan is to set out priorities and ensure that implementation of this plan is guided by this prioritisation. This process of prioritisation was informed by the scientific characterisation, public consultation processes and a broad consideration of resources and resource constraints.

The prioritisation of actions towards the objectives must maximise the value of constrained resources, ensure cost effectiveness of measures, and ensure that delivery of this Plan is most effective and efficient over the short, medium and long term.

The latest information on the status of our water bodies and the outputs of the risk characterisation process were particularly important in deciding on these priorities. Some key findings include:

- Further progress is necessary to achieve full compliance with existing EU legislation.
- Over the period of the first cycle 900 monitored river or lake water showed an apparent change in status (i.e. either improved or dis-improved) with a net decline of 3% in the number at satisfactory ecological status (high or good).
- Further progress is also necessary if we are to meet protected area requirement, for example, 24% of SACs with water dependency are assessed as being at risk of not meeting their protected area objectives.
- The deterioration of high status water bodies has emerged as an important issue, with 130 river water bodies or lakes assessed as being at risk of not meeting their high status objective.
- The characterisation process has found a complex position with regard to the frequency of different significant pressures across the river basin district – with 73% of at risk water bodies subject to more than one significant pressure.
- Hydromorphology, including barriers, has emerged as a significant pressure impacting on water quality within the river basin district.

In line with the above, the following prioritisation was decided upon for this cycle of the river basin management plan:

- Ensure full compliance with relevant existing EU legislation
- Prevent deterioration
- Meet the specific water related objectives required for our protected areas
- Specifically protect and restore our high status objective water bodies
- Implement focused sub-catchment pilot schemes that will (i) target water bodies where evidence suggests they could achieve status improvements during this cycle; and (ii) progress pilots in sub-catchments with more complex issues that require multi-disciplinary and cross agency approaches.
- Work to improve our knowledge and understanding of hydromorphology and barriers as pressures impacting on water quality, including identifying the scale of these issues, and building the expertise necessary to address them.

The next section will set out the Programme of Measures necessary to move towards these objectives. The practical implementation of this plan will be fully cognisant of the priorities set out above. How we plan to implement measures in line with these priorities will be set out in section 10. The expected impact of the Programme of Measures, along with how we plan to monitor progress, will be set out in sections 11 and 12.

Section 7:

Measures to protect & improve our water bodies

As outlined in Section 5, the significant pressures impacting on waterbodies were classified into 14 categories. This section outlines the measures aimed at addressing these pressures. It focuses on the main measures that will achieve progress across the river basin district, and also outlines how more local, catchment and water body specific supporting measures will be developed and implemented. Table 7.1 sets out the significant pressures on at risk water bodies, and the associated sub-sections which set out the proposed programme of measures to address those significant pressures.

	Significant pressure	Category of Measure	Sub-section
1	Agriculture	Address pressures from rural diffuse & point sources	7.1
2	Domestic Waste Water Systems		
3	Urban Waste Water	Address pressures from urban waste water & urban run off	7.2
4	Urban Run Off		
5	Forestry	Address pressures from forestry	7.3
6	Extractive Industry	Address pressures from harvesting of peat	7.4
7	Invasive Species	Protect water bodies from invasive species	7.5
8	Physical Modification	Improve physical condition of water environment	7.6
9	Abstractions/Diversion	Address abstraction pressures	7.7
10	Industry	Other measures	7.8
11	Waste	Other measures	
12	Historically Polluted Sites	Other measures	
13	Water Treatment	Other measures	
14	Others	Other measures	

Table 7.1: The significant pressures on at risk water bodies and category of measures aimed at addressing those pressures.

7.1 Addressing pressures from rural diffuse and point source pollution

Primary agricultural production and domestic waste water treatment systems are key sources of rural diffuse and point source pollution. The catchment characterisation process found agriculture to be a significant pressure in approximately 67% of 'at risk' waterbodies. Excess nutrients, chemicals such as pesticides as well as sediment loss due to poor land management have all been identified as likely pressures in certain waterbodies. Domestic waste water treatment systems were also identified as a further significant pressure in a rural context, with 13% of at risk waterbodies impacted by this pressure.

The characterisation process has identified risk based on current information and trends. Food Wise 2025, which is the Report of the 2025 Agri Food Strategy Committee, sets out a cohesive, strategic plan for the development of agri-food sector over the next decade. It is a key consideration in addressing pressures on water over this cycle of river basin planning. The Food Wise 2025 Strategy sets out ambitious industry targets including, increasing the value of food exports by 85% by 2025 and increasing value added in the sector by 70%. It foresees an increase in the value of primary production by 65%. Food Wise 2025 identifies the strategic value of the sector to rural Ireland as well as key opportunities for the sector into the future. However it also recognises that 'a significant increase in food production cannot be considered in isolation from its environmental impact' and that future food production systems must manage and sustain our natural resources, including water.

Sustainability is, therefore, a key pillar of the strategy and considered critical to the delivery of the strategy objectives. A 'High level Implementation group', chaired by the Minister for Agriculture, Food and the Marine oversees implementation of the recommendations within the strategy, including 69 sustainability related recommendations. Furthermore, a Food Wise Implementation Plan has been published along with the strategy and will be a key mechanism for ensuring that relevant evidence is gathered during implementation to inform decisions on achieving and maintaining a sustainable agriculture sector. In addition, a Food Wise 2025 Environmental Sustainability Committee was established in 2016 to evaluate and assess the delivery of environmental sustainability and mitigation actions in the Food Wise Implementation Plan.

Much of the increase in the value of output will be achieved through the adoption of the latest production technologies and processes in order to maximise production efficiencies. This will require enhancements and investment in terms of knowledge transfer and educational supports. However, structural changes are also expected in the agricultural sector. The Strategic Environmental Assessment for Food Wise 2025 sets out a "sustainable growth scenario" which, for example, projects that much of the increased dairy output will be driven by breeding dairy cows for greater milk yield while maintaining or reducing cow size, thereby decreasing feed intake and waste output.

Overall, the Food Wise 2025 scenario projects an increase in milk production, stable beef production and a relatively stable total cattle population. Increased milk production has and will be achieved through a slight increase in cow numbers and increased milk production per cow based upon accelerated genetic improvement of the national herd. The result of changes in the national herd composition will lead to a small (+2.9%) increase in national bovine manure N excretion between 2005-07 and 2030. Food Wise 2025 is also expected to result in changes to our national inorganic fertiliser use. Inorganic N fertiliser is projected to increase by 8.8% between 2005-07 and 2030 and there is expected to be an increase in N use efficiency. National P fertiliser use is more difficult to predict. The current nitrates regulation imposes maximum rates for phosphorus fertiliser based on inputs meeting crop offtakes. All sources of phosphorus must be taken into account, e.g. concentrates fed to livestock and P in livestock manure as well as mineral fertilisers. Additional phosphorus fertiliser above that required to meet crop offtake is only allowed when a soil analysis shows a need for it.

However, it is acknowledged that the structural changes within the sector will impact differently in different areas of the country. Areas associated with dairy production are expected to see increased animal numbers. There are currently 7,000 predominantly dairy farmers availing of a higher stocking rate allowance under the nitrates derogation. These derogation farmers are subject to stricter controls such as mandatory nutrient management planning and soil sampling, annual submission of fertiliser accounts and an increased level of field inspection.

To ensure the vision of sustainable growth is achieved, the changes within the sector will need to be monitored, the impacts of these changes analysed and, where necessary, the measures and interventions set out in this section will be focussed on areas of potential emerging pressures on water quality. New targeted initiatives may need to be developed during the course of this 2nd cycle river basin management plan to respond to emerging pressures.

7.1.1 High level actions to address rural diffuse and point source pollution:

As set out in detail in Section 3 of this draft RBMP, the Nitrates Regulation and associated Nitrates Action Programme is the primary agricultural measure in place to support meeting the objectives of the WFD. This will remain the case during the second cycle, and the provisions of the Nitrates Regulations and the associated measures outlined in the NAP will continue to set the minimum environmental baseline which all Irish farmers must achieve. During the course of this cycle, the integrated Governmental approach to enforcement of the nitrates regulations will be maintained and strengthened. The interagency/inter-departmental Water Quality and Agriculture working group will ensure increased targeting of inspections by Local Authorities based on risk assessments and water quality results. Any new findings by IMPEL (European Union Network for the Implementation and Enforcement of Environmental Law) in relation to "Recommended minimum criteria for environmental inspections" will be incorporated in the selection procedure. Data from the EPA catchments characterisation programme will be used to identify catchments where Local Authorities should prioritise agricultural inspections. DAFM will continue to undertake inspections in support of Local Authorities and to share information that assists in targeting inspections. An information campaign will commence in early 2017 aimed at addressing farm management issues with the objective of improved compliance rates.

The existing Domestic Waste Water Treatment Regulations and associated inspection regime, also set out in greater detail in Section 3, will continue to be an important measure over the period of the second cycle. The EPA has responsibility for developing and overseeing a National Inspection Plan to support the regulations, and it has recently published the second National Inspections Plan 2015-2017. By the end of 2014, a total of 1,559 inspections were carried out. A national targeted engagement campaign is also being progressed by the EPA in co-operation with the local authorities and other stakeholder groups to address issues identified during these inspections, for example, appropriate de-sludging of tanks. The EPA will prepare the third plan during 2017 and this will incorporate the information gathered from the RBMP characterisation process to ensure the inspection regime takes account of those areas where the evidence shows septic tanks are likely to be impacting on water quality.

Two other statutory measures were also detailed in Section 3, the Pesticides Regulations and the Agriculture Environmental Impact Assessment Regulations. The former provides for compulsory registration and training of professional users of pesticides, and for restrictions/safe guard zones, in particular surrounding drinking water abstraction points. The latter provide for an EIA screening and consent process for farmers with regard to activities such as land drainage works. These statutory measures will continue to be important measures over the period of the second cycle.

7.1.2 Supporting measures for rural diffuse and point source pollution:

In addition to the high level actions in place, and which will continue and evolve during this second cycle, there are four key supporting measures envisaged. These are;

- Targeted agri-environment schemes under the Rural Development Programme (RDP) 2014-2020.
- The Agricultural Catchments Programme (ACP).
- Knowledge Transfer and the widespread adoption of best practice and
- Monitoring of sectoral changes and 'modelling' of water quality impacts.

7.1.2.1 Rural Development Programme (RDP) 2014-2020:

With an enhanced focus on delivery of good environmental outcomes, a more 'targeted' approach has been taken to the current Rural Development programme. The RDP 2014-2020 consists of a suite of measures designed to enhance the competitiveness of the agri-food sector, achieve more sustainable management of natural resources and ensure more balanced development of rural areas. The allocation for RDP 2014-2020 amounts to almost €4 billion, of which €2.19 billion is funded by the EU. A more targeted approach has been taken to this current programme, with an enhanced focus on delivering positive environmental outcomes. There is a strategic focus on water quality objectives and two targeted agri-environment schemes under the RDP have important roles as supporting measures to improve water quality, the Green Low Carbon Agri-Environment Scheme (GLAS) and Targeted Agriculture Modernisation Scheme (TAMS).

Green Low Carbon Agri-Environment Scheme (GLAS): GLAS is a targeted agri-environment scheme under the RDP, with a budget of €1.4bn for the period 2014-2020 and an expected 50,000 farmers participating. The objective of the scheme is to improve the rural environment by improving water quality, mitigating climate change and promoting biodiversity. Actions to-date such as fencing of watercourses (13,000 km), low input farming (284,000ha) and catch crops (17,000 ha) are examples of key interventions at farm level supporting the delivery of the next phase of River Basin planning. Participating farmers must engage a trained agricultural advisor, participate in action specific training, and have a nutrient management plan in place to receive full payment in the scheme. Unlike previous agri-environmental schemes which provided equal access to all farmers, GLAS prioritises farms in

specific areas with key actions. Prioritisation of farms within vulnerable catchments and 'high-status' waterbodies is a key feature of the GLAS programme. Additionally, there is increased focus within the programme on ensuring farmers understand the reasoning behind the environmental benefits of the measures they are undertaking and providing advisory support. This will promote the implementation of 'best practices' at farm level, improving efficiency and environmental outcomes as a result. The cumulative environmental benefits from these actions are expected to materialise over the period towards 2020 and beyond and the results will be monitored and evaluated.

Targeted Agricultural Modernisation Schemes (TAMS):

Previous capital investment schemes allowed access to all farmers across a variety of sectors, whereas new schemes are specifically prepared for and targeted at individual sectors or issues that will bring about the greatest increases in efficiency. The Targeted Agriculture Modernisation Scheme provides grant assistance to farmers for investments related to the pig and poultry sectors, dairy equipment, the storage of slurry, soiled water and other farmyard manures and related facilities. €395m is allocated to these investments, which will leverage a further €500-600m in investment by farmers. €190m of the €395m is specifically targeted at two schemes which form part of the TAMS; the Animal Welfare, Safety and Nutrient Storage Scheme and the Low Emission Slurry Spreading Scheme. These will lead to a significant investment in nutrient storage and improved nutrient utilisation over the period of the next River Basin planning cycle. Increased purchase of low emission spreading equipment will increase the volume of slurry that will be spread using this equipment, providing an opportunity to improve the utilisation of nutrients in manure and offset chemical fertiliser use on more intensive farms.

Other RDP Schemes: A focus on 'bottom-up' approaches to delivery of environmental objectives is supported through the assignment of €70 million to what are termed 'locally led' schemes under the programme. This approach builds on the experience gained in implementation by DAFM of the internationally acclaimed 'Burren Beo' project. Supporting the next phase of River Basin plans, a locally-led Freshwater Pearl Mussel (FPM) Scheme targeting 8 priority Freshwater Pearl mussel sites is currently under development and will be subject to European Commission approval. Full details of this scheme, are provided in Section 8 on measures to meet our protected area objectives. A competitive 'call' is proposed also to support delivery of locally focused environmental scheme including those focused on the water environment.

7.1.2.2 Agricultural Catchments Programme (ACP)

As outlined in section 3, the ACP will continue to work with over 320 farmers across six catchments to evaluate the environmental and economic effects of the NAP measures implemented under the Nitrates Directive. The outputs of this programme show that good nutrient management and farm management practices can reduce phosphorus source pressure whilst maintaining high production levels. The programme has also shown that behavioural change that brings about positive impacts can be secured, for example,

changing the timing of slurry application to better match the peak growing season and thus enhancing nutrient uptake and limiting losses to water and improved nutrient use efficiency leading to reduced losses of nitrogen and phosphorus to waters. Knowledge exchange and the general facilitation of information sharing are seen as key to ensuring best practice is adopted. The outputs of the programme also point to the issues of poorly drained soils posing a greater challenge in terms of mitigating the risks to water quality. The third cycle includes a specific requirement for 'measuring and monitoring' any impact of Food Wise 2025 on the water environment through detailed monitoring work being conducted in the catchments. Transferring learning's from the ACP to all farms will also be an important added focus of the current programme.

7.1.2.3 Promoting the adoption of best environmental practice through Knowledge Transfer (KT):

Effective 'knowledge exchange' is seen by all stakeholders as the key to ensuring that best environmental practice is achieved on farms. Better nutrient management and the management of environmental risks on a widespread basis provides the opportunity for more positive outcomes than regulatory drivers alone. There are over 130,000 farms nationally, and whilst the long term target will be to ensure all farms and farmers are targeted for the adoption of best practice through knowledge transfer, during this second cycle we will develop this area through two key actions; (i) the National Dairy Sustainability Forum and (ii) wider knowledge transfer and adoption of best practice.

National Dairy Sustainability Forum: The dairy industry is the sector with the most potential for growth in output, thus contributing to the aims of Food Wise 2025. All stakeholders, from farmer to industry to government recognise the need to ensure that this expansion is sustainable. A joint industry/farmer/government forum, the National Dairy Sustainability Forum, initiated by the Irish Dairy Industry Association, will drive the development and roll out of a targeted knowledge transfer programme to effectively deliver the key learnings from the ACP and on soil fertility improvements to dairy farmers.

Membership of the Forum is drawn from the key sectoral and industry stakeholders with participation from Bord Bia, the dairy co-operatives who process the milk, farm organisations, Teagasc, the Department of Agriculture, Food and Marine (DAFM), the DHPCLG, local authorities and the EPA.

Three strategies will be implemented as a first phase of the development of a phased multi-annual change management programme and to develop on-farm technical options, strategies and solutions. A co-operative led farm pilot programme will be established by a number of the participating co-operatives to incorporate best practice from the ACP in particular soil fertility – focusing on both economic and environmental outcomes. Further to this pilot approach, a wider promotion programme on better nutrient management will be developed and implemented for dairy farmers supplying to the co-operatives. In addition a

promotion programme will be developed and implemented to support best practice in the management of point source pollution on participating farms. It will be the task of this group to collaboratively address the on farm economic and environmental sustainability challenges for the dairy industry in a broader and more strategic way than currently takes place – and to realise the benefits of the knowledge that has developed over recent years. It is envisaged that this approach will be part of an evolution of the existing Origin Green scheme, promote the sustainable development of the sector, and provide benefits in terms of economic viability, water quality and climate impact.

Wider knowledge transfer and adoption of best practice: A budget of €100m has been allocated from the RDP for a programme aimed at the adoption of best practice through knowledge transfer and the full implementation of this measure is a recommendation of the FW 2025 strategy. The purpose is to up skill farmers and agricultural advisors. Specific advice will be provided on environmental, bio-diversity and climate change issues to help contribute to the development of a more sustainable agri-sector. This programme will roll out professional advisory and knowledge transfer services to 27,000 farmers across all sectors. This voluntary programme will ensure those farmers who obtain the services are engaged with the programme and will adopt the plans and practices proposed by the advisory service.

To further support good nutrient management across the entire country, an on-line nutrient management planning (NMP) system has been launched by Teagasc and made available to all Farm Advisory System (FAS) approved planners. This tool is unique in Europe and will promote and encourage efficient fertiliser use at a national level – therefore reaching those farms not addressed by the other KT actions. Use of this system will be mandatory for farmers in GLAS and for derogation farmers – accounting for almost 60,000 farmers. Its core enhancement is translating exacting nutrient management in to pictorial presentation at field level with colour coded identification of field nutrient status.

7.1.2.4 Monitoring sectoral changes and modelling water quality impacts

It is accepted that Ireland faces significant challenges in meeting water quality targets while increasing production in the agricultural sector and the Food Wise 2025 strategy prioritises the sustainability of production systems and the need for monitoring of any environmental risks and impacts. The progress of catchment characterisation by the EPA, the Food Wise 2025 Implementation Plan coupled with intensive monitoring of specific catchments through the ACP programme will provide a platform for monitoring and modelling any potential risks or impacts under Food Wise 2025. The ACP programme will have a key role in providing the scientific basis to support the development of targeted mitigation initiative, where necessary, to deliver the sustainability pillar which is critical to the success of the Food Wise 2025 Strategy.

7.1.3 Rural diffuse & point source pollution – principal actions for the 2nd cycle:

The following sets out the principal actions for the second cycle with regard to addressing rural diffuse and point source pollution:

1. Existing high level measures, namely, (i) nitrates regulations, (ii) domestic waste water treatment regulations, (iii) pesticides regulations; and (iv) agriculture environmental impact assessment regulations will continue to form a key part of the actions over the second cycle.
2. The integrated Governmental approach to enforcement of the nitrates regulations will be maintained and strengthened, and the interagency/inter-departmental Water Quality and Agriculture working group will ensure increased targeting of inspections by Local Authorities based on water quality results and the outputs of the characterisation process.
3. In developing the 2018-21 National Inspections Plan for domestic waste water systems we will use the outputs of catchment characterisation to further improve the existing risk based approach set out in the current 2015-17 plan.
4. Under the RDP, the GLAS Scheme, with a budget of €1.4bn for the period 2014-2020 will see 50,000 farmers participating and implementing actions to improve the rural environment, including actions to improve water quality. The scheme prioritises vulnerable and high status catchments, and has a strong focus on ensuring farmers understand the environmental benefits of their actions. Also under the RDP, the TAMS scheme will facilitate total investment of around €500m-600m for better management and storage of animal manures, including more efficient spreading equipment. The 'targeting' of these agri-environmental schemes and interventions rolled out by DAFM will continue and respond to emerging knowledge and evidence (such as catchment characterisation).
5. A joint industry/farmer/government forum, initiated by the Irish Dairy Industry Association, will drive the development and roll out of a targeted knowledge transfer programme to effectively deliver the key learning's from the Agricultural Catchments Programme to dairy farmers. It is envisaged that this will consist of both co-operative led farm pilot programmes and wider promotion programmes for nutrient management and management of farm pollution point sources. It will be part of the evolution of the existing Origin Green scheme, promote the sustainable development of the sector, and provide benefits in terms of economic viability, water quality and climate impact.
6. In addition, and to promote the adoption of best environmental practice across different sectors of agriculture, €100m has been allocated from the RDP for a knowledge transfer programme with the purpose of up-skilling farmers and agricultural advisors. Over the lifetime of the RDP, this programme will roll out professional advisory and knowledge transfer services to around 27,000 farmers across all sectors on a voluntary basis. Farmers will receive compensation for participating in targeted knowledge transfer groups and the professional agricultural advisors will be trained in facilitating such groups and will also receive compensation for facilitating groups. One of the core requirements for participants in the knowledge transfer measure will be the completion of a farm improvement plan which includes a sustainable management plan.
7. To further support good nutrient management across the entire country, an on-line nutrient management planning (NMP) system has been launched by Teagasc and made available to all Farm Advisory System (FAS) approved planners. Use of this system will be mandatory for farmers in GLAS and for derogation farmers – accounting for almost 60,000 farmers.
8. It is accepted that Ireland faces significant challenges in meeting water quality targets while increasing production in the agricultural sector, and a key recommendation of the Food Wise 2025 strategy is the need to monitor the environmental impacts of the strategy. DAFM will work closely with relevant agencies to ensure this monitoring takes place. In particular the ACP programme will model and monitor the impacts of agricultural development under Food Wise 2025 in specific catchments. Where necessary, the measures and interventions set out in this section will be focussed on areas of potential emerging pressures on water quality. New targeted initiatives will be developed where necessary to ensure that the sustainability objectives of Food Wise 2025 are met.

7.2 Addressing pressures from urban waste water and urban run off

The outputs of the catchment characterisation process found that urban waste water and urban run-off respectively account for around 22% and 10% of significant pressures on at risk river and lake water bodies. Urban waste water pressures on water bodies include the discharge of inadequately treated effluent and intermittent discharges from storm water overflows.

The principal measure with regard to urban waste water is compliance with the UWWTD and compliance with EPA discharge licence Emission Limit Values. As outlined in Section 3 progress was made in this regard during the first cycle. Investment for the period to 2021 has been prioritised by Irish Water based on ensuring appropriate levels of treatment for compliance with emission limit values, meeting the requirements for protected areas, and the elimination of raw sewage discharges where they occur. The actions currently being progressed, and which will continue to be progressed out to 2021, flow from these priorities. The details are set out in the strategies, plans and programmes developed by Irish Water since it was established in January 2014.

7.2.1 High level actions to address pressures from urban waste water and urban run off

The key high level actions aimed at addressing urban waste water pollution are:

- Licensing or certification of urban waste water discharges to the aquatic environment from sewerage systems owned, managed and operated by water service authorities.
- Ensuring compliance with the UWWTD and EPA discharge authorisation conditions through the implementation of the Irish Water – Water Services Strategic Plan and the associated Irish Water Investment Plan.

As outlined in Section 3, the EPA is responsible for authorising and regulating urban waste water discharges. Licences are required where the population equivalent of the urban area is greater than 500, and certificates of authorisation are required below that threshold. These authorisations include conditions that address the requirements of the UWWTD and, where necessary, establish a requirement for more stringent treatment on the basis of the “combined approach” set out in Article 10 of the WFD where more stringent treatment is needed to implement a requirement set out in river basin management plans. It is the responsibility of Irish Water to comply with the requirements of these licences and authorisations. Licence conditions may lay down requirements for operational and infrastructural improvements to both the collection and treatment systems where necessary to meet the prescribed objectives of river basin management plans.

Having now licenced 505 agglomerations, and issued certificates of authorisation for a further 543 urban areas, the EPA's focus will

continue to be the monitoring and, where necessary, enforcement of licence conditions over the period of this second river basin management planning cycle. Licence reviews will be undertaken where necessary to better align licence requirements with the environmental priorities set out in this plan. The EPA's priorities for improved urban waste water management include ensuring compliance with the UWWTD; the elimination of raw sewage discharges; eliminating serious pollution; improving the status of water bodies impacted by sewage pollution; and the protection of sensitive areas such as shellfish growing waters, bathing waters and freshwater pearl mussel habitats.

Over the period 2017-2021 Irish Water plan to invest approximately €1.7bn in wastewater projects, programmes and asset maintenance, of which €880m is planned for major waste water treatment projects.¹¹ A total of 105 wastewater treatment plants will be either upgraded or newly built. This investment covers a broad range of urban areas, for example, 46 agglomerations are above 2,000 population equivalent and 17 relate to urban areas of less than 500 population equivalent.

Improvements to collection systems are also planned, with projects commencing in 41 agglomerations, with a total planned investment of €349 million. In some instances these works are necessary to resolve potential UWWTD compliance issues, however, the majority of works are aimed at ensuring that collection system performance supports continued environmental compliance and achievement of Water Framework Directive environmental objectives. In addition to improvements to collection networks, a programme of Drainage Area Plans (DAPs) for wastewater collection systems is planned for 44 agglomerations over the period to 2021. The focus of these plans is to better understand the performance and impacts of collection systems in order to identify improvements, for example, in the operation of storm water overflows. In prioritising the agglomerations chosen for DAPs the main focus is compliance with the UWWTD and meeting other environmental objectives.

The remaining €145m of the €1.7bn is for capital maintenance of waste water treatment plants and waste water collection systems.

Furthermore, in line with Irish Water's Water Services Strategic Plan¹² development of a Wastewater Compliance Strategy will commence in 2017. This strategy will build on the plans, projects and programmes in place. It will focus on compliance with the UWWTD, as well as on meeting the objectives of the RBMPs, at an affordable cost and within an achievable timeline; aligning regulatory and river basin planning cycles and legislative requirements. The timeline for the strategy reflects the need to ensure consistency with the development of RBMPs, as well as the importance of undertaking appropriate stakeholder consultation. The work will be evidence based; incorporating catchment assessments of discharges from Irish Water's assets, and making best use of ongoing outputs from the EPA's catchment characterisation activities.

¹¹ Irish Water Investment Plan 2017-2021

¹² Irish Water's Water Services Strategic Plan https://www.water.ie/docs/WSSP_Final.pdf

7.2.2 Supporting measures for urban waste water and urban run-off

In addition to the high level measures outlined above a number of supporting measures aimed at addressing urban waste water pollution are in place or planned. These include;

- Improved operational and maintenance practices
- Review of nutrient sensitive areas in the context of the UWWTD
- Targeted investment in sub-threshold WWTPs; and
- Research and innovation in the management of urban waste water

Improved operational and maintenance practices: Capital investment in wastewater treatment and collection systems, together with optimal operation of these assets, is necessary to ensure compliance with the UWWTD and to meet environmental objectives. A key benefit of a national water services utility is in the delivery of better knowledge sharing and the implementation of best practice at national level. Over the period of this second cycle, Irish Water will continue its work developing and implementing Standard Operating Procedures for the operation, maintenance and inspection of waste water treatment plants and collection systems. Irish Water will also continue the development of asset registers and refinement of treatment plant capacities, which facilitate improved asset management.

Review of nutrient sensitive areas in the context of the UWWTD: The EPA recently completed a review of nutrient sensitive areas, in line with the provisions of the UWWTD. Of the 72 agglomerations examined as part of the review, a total of 47 were identified as having areas downstream showing evidence of nutrient sensitivity compared to 45 in the 2010 review. Urban waste water discharges within the catchments of newly identified nutrient sensitive areas will now be subject to the requirement for more stringent treatment as laid down in the UWWTD.

Targeted investment in sub-threshold WWTPs: It is recognised that in some instances the performance of smaller plants, which are subject to certificates of authorisation, can be the cause of significant pressures in water bodies which have been prioritised for action in this river basin management plan. Expenditure of €12 million, targeted at such plants, has been included in the current Irish Water Investment Plan 2017-2021.

Research and innovation in management of urban waste water: The Irish Water CER Innovation Fund has been allocated by the CER to encourage Irish Water to invest in research and innovation projects. Proposed research projects must further a range of objectives, including achievement of relevant environmental standards and the objectives of the Water Framework Directive. Irish Water is currently involved in a number of research projects and programmes such as EPA STRIVE, INTERREG and Water JPI Research which will contribute to further supporting the long term needs of Ireland's water and wastewater sector.

7.2.3 Urban Waste Water and Urban Run-off – principal actions for the 2nd cycle:

The following sets out the principal actions to address pollution from urban waste water and urban run off over the period of the second cycle:

1. EPA will continue to authorise and regulate waste water discharges from urban areas.
2. Compliance with the requirements of the UWWTD and EPA discharge licence Emission Limit Values will be achieved through the implementation of the Irish Water Business Plan and associated Irish Water Investment Programme.
3. Over the period 2017-2021 Irish Water plan to invest approximately €1.7bn in wastewater projects, programmes and asset maintenance, of which approximately €880m is planned for major waste water treatment projects and approximately €350m for capital investment in collection systems. This investment will result in 105 new or upgraded treatment plants in agglomerations or urban areas and works on collection networks in 41 areas.
4. In addition to the above, Drainage Area Plans (DAPs) for waste water collection systems will be completed for 44 agglomerations by 2021, with the prioritisation of plans based on compliance with the UWWTD and meeting other environmental objectives.
5. Irish Water will continue to develop and implement best operational practice across all of their assets, including developing and implementing Standard Operating Practices for all WWTPs, developing a full asset register, and completing a review of treatment plant capacities.
6. Irish Water will commence developments of their Wastewater Compliance Strategy in 2017. This will build on existing plans, projects and programmes and provide a long term strategy for ensuring compliance with the requirements of the UWWTD and meeting the requirements of river basin management plans in a cost effective manner.
7. The outcomes of the EPA review of nutrient sensitive areas will be implemented. Waste water discharges into the catchments of newly identified nutrient sensitive areas will be subject to the relevant requirements of the UWWTD.
8. Expenditure of €12 million, targeted at smaller plants causing significant pressures, has been included in the current Irish Water Investment Plan 2017-2021.
9. There will be ongoing research and innovation in the areas of urban waste water management, funded at both national and European level.

7.3 Addressing pressures from forestry

The Forest Service of the DAFM is aware of the negative impacts inappropriately sited forests and poorly managed forest operations can give rise to, particularly in terms of sedimentation and nutrient runoff, and damage to water quality, aquatic habitats and aquatic species such as salmonids and Freshwater Pearl Mussel. As such, the protection of water forms a key component of its assessment of all proposals for regulated forestry activities. However, the Forest Service and the wider forest sector also highlight the significant role that properly sited and managed woodlands and forests can play in protecting water, through the delivery of a range of water-related ecosystem services.

7.3.1 Programme of measures to address pressures from forestry

Forestry regulation: As the national forest authority, the Forest Service has numerous responsibilities in relation to forest activity in Ireland. These principally revolve around the statutory regulation of key forestry activities (afforestation, forest roading, thinning, felling and replanting, and aerial fertilisation). Under the State-aided 2014-2020 Forestry Programme, the Forest Service also promotes sustainable forest management through various schemes, including the Afforestation Scheme, the Woodland Improvement Scheme, the Forest Road Scheme and the Native Woodland Conservation Scheme.

In the years 2014 to 2015, the following were carried out under the Forest Service assessment procedures: 12,449 hectares of new forests were planted on 1,981 sites, comprising 21% broadleaves and 79% conifers. As per the required standards, each site includes 15% open space and retained habitat (include water setbacks) and 10% broadleaves. 4,908 Felling Licences were issued, covering 32,929 ha of thinning and 23,595 ha of clearfell. 326 km of new forest roads were constructed.

As the consenting authority, the Forest Service has key responsibilities under the WFD and the Habitats Directives (as set out in transposing legislation), regarding its assessment of any application for the above activities.

As part of its assessment process, the Forest Service applies a variety of procedures to ensure that any approval, if issued, is in keeping with the principles of sustainable forest management and the protection of the environment, including water. Elements of the process include referrals to various bodies, Appropriate Assessment screening and Environmental Impact Assessment screening, site and GIS-based inspections by Forestry Inspectors, and adherence to various Forest Service requirements, protocols and scheme rules.

Land Types for Afforestation: The Forest Service Land Types for Afforestation process (which commenced in 2016) excludes a range of sites from the Afforestation Scheme on timber productivity grounds, due to infertile conditions (as indicated by vegetation) and / or other inhibiting site factors. This overlaps with many habitats (including Annex 1 habitats, particularly wet and dry heath and blanket and raised bog) and landscapes that are highly sensitive from a water perspective, effectively excluding afforestation as a land use from these areas.

Environmental Requirements for Afforestation: The Forest Service Environmental Requirements for Afforestation document outlines mandatory requirements for all afforestation, whether grant aided or not. These requirements consolidate and update existing environmental guidelines and contain various additional safeguards regarding the protection of water, including greater water setbacks, the inclusion of native woodland plots along watercourses, and the incorporation of a Potential Water Risk Scenario table and a template Water Management Plan, for use where particular concerns exist regarding water.

Coillte's Environmental Risk Assessment (ERA) approach:

As the owner of over half of Ireland's forested lands, Coillte has a significant role to play in protecting water quality from potential impacts arising from its forest operations. In addition to the environmental controls applied by the Forest Service, as outlined above, Coillte operates an Environmental Risk Assessment procedure to assess and manage potential environmental impacts associated with its forest operations. The ERA procedure identifies the sensitivity of sites to certain forestry activities and then specifies the planning actions and mitigation options that must be considered on various site types. The ERA procedure therefore integrates environmental risk assessment into each stage of the planning and operational process associated with tree felling.

Forest and water research: The DAFM research programme for forestry is set out in the document *Forest Research Ireland – Meeting the needs of Ireland's forest sector to 2017 through research and innovation*. This programme allows significant scope for water-related research activity. Historically, the DAFM has also funded research projects studying the interaction between forests and water. Recent relevant research which influence forest policy and practices in relation to water include the following:

- Forestry Management for the Freshwater Pearl Mussel (FORMMAR).
- Combined Research on Riparian Woodland (CROW): A 4-year project (2010-2014) studying aquatic buffer zones (ABZs) in forests
- Assessment of the Impacts of Forest Operations on the Ecological Quality of Water (HYDROFOR): A 7-year (2008-2014) project jointly funded by the EPA and the DAFM.

Forestry promotion: The Native Woodland Scheme package provides funding to undertake potentially significant works in relation to the delivery of water-related ecosystem services. It is implemented by the Forest Service in partnership with Woodlands of Ireland, DAHRRGA, the Heritage Council and other native woodland stakeholders. It comprises of two separate schemes:

- The Native Woodland Establishment Scheme (NWS Est.) funds the creation of new native woodland on open greenfield sites. This scheme has the potential to deliver water-related ecosystem services, as set out in the recent Forest Service document Woodland for Water (see below).
- The Native Woodland Conservation Scheme (NWS Cons.) funds the appropriate restoration of existing native woodland and the conversion from conifer forest to native woodland, primarily for native woodland biodiversity but also to deliver water-related ecosystem services. The scheme is also weighted towards water-sensitive sites.

Proposed Environmental Enhancement of Forests Scheme:

The Forestry Programme 2014-2020 includes a funding measure entitled the Environmental Enhancement of Forests Scheme. Under this scheme, a fixed grant will be available to forest owners to undertake particular actions and to achieve structural changes within existing forests and during current rotations, to improve the environmental 'footprint' of those forests regarding impacts on water quality, habitats and species, archaeological sites, landscape and other environmental sensitivities. The scheme is currently in development stage, and once released, will be of relevance to existing forests within water-sensitive areas.

Draft Plan for Forestry and Freshwater Pearl Mussel in Ireland:

Forest Service is currently developing a Plan for Forestry and Freshwater Pearl Mussel (FPM) in Ireland, which will have direct relevance in relation to high status objective waterbodies and protected areas. This proposed Plan will comprise the following elements:

- the development of a Forestry Management Framework to apply to forestry operations and developments within the 27 catchments of FPM populations in rivers designated as SACs for the species;
- a programme of measures within the Priority 8 FPM Catchments; and
- targeting of priority sites within all 27 catchments, where active engagement with forest owners and landowners will result in the elimination of risk or the realisation of enhanced protection.

KerryLIFE: The Forest Service is a co-beneficiary in the EU KerryLIFE project, led by DAHRRGA and involving DAFM, Coillte, Teagasc, the community-based South Kerry Development Partnership, and others. KerryLIFE is focused on sustainable land use management for the conservation of Freshwater Pearl Mussel. KerryLIFE is trialling a wide range of approaches under both agriculture and forestry, and the outcome of the latter will have the potential for much wider application. The project will run to December 2019.

Proposed Woodland for Water measure: As set out in its document Woodland for Water: Creating new native woodlands to protect and enhance Ireland's waters (September 2016), the Forest Service proposes the strategic deployment of a measure combining an undisturbed water setback and new native woodland to form permanent semi-natural landscape features designed to deliver water-related ecosystem services, such as: reduction in sediment mobilisation and runoff into watercourses, interception of nutrient runoff into watercourses, bank stabilisation, food input into the aquatic ecosystem, shading / cooling regulation of floodwater and mitigating acidification.

The 'Woodland for Water' measure has been proposed by the Forest Service in the context of ongoing discussions regarding the 2nd Cycle of the WFD. Funding is currently in place under NWS Est. to realise the measure, and further work is being undertaken with other key parties to identify ways to strategically target it at key sites, particularly high status objective waterbodies, and to encourage landowners in its uptake.

7.3.2 Forestry - principal actions for the 2nd cycle:

The following sets out the principal actions related to forestry;

1. Forestry Services will implement the regulations, policies and requirements related to forestry which are being realigned with national water policy.
2. Coillte, which owns over half of Ireland's forested lands, will continue to implement its integrated Environmental Risk Assessment approach to its forestry operations.
3. Forestry Services will promote the uptake of the native woodland establishment and conservation scheme and the environmental enhancement of forests scheme.
4. With regard to the protection of freshwater pearl mussel population from forestry pressures, Forestry Services will develop and implement plans for the protection of designated populations of freshwater pearl mussel from forestry pressures; and complete the ongoing KerryLife project with project partners.
5. Forestry Services will work with other stakeholder, in particular local authorities, to ensure the strategic deployment of forestry measures to protect high status waters and progress the other priorities set out in this river basin management plan.
6. DAFM and EPA will continue to undertake forestry and water research to inform future forestry practices for the protection and enhancement of water quality.

7.4 Addressing pressures from the harvesting of peatlands

At present large scale peat extractive industries are required to hold an Integrated Pollution Control (IPC) licence from the EPA for their activities. This relates to peat extraction from areas above 50 hectares. Bord Na Móna currently owns 6% of the peatlands of Ireland and is the single largest peat extraction licensee. The licences issued for peat extraction activities, undertaken by Bord Na Móna, encompass an area of approximately 80,000ha. Of that 80,000ha active peat extraction currently occurs on approximately 20,000ha. The area included within the licensed installation boundaries is not all an active peat extraction area but includes significant areas of undisturbed peat land, buffer areas, silt ponds (Bord Na Móna manage more than 500 silt ponds) and lands under rehabilitation. In addition to Bord Na Móna the EPA currently has licence applications from two other private commercial peat extraction companies.

7.4.1 Programme of measures to address pressures from harvesting of peatlands

Improvements to legislative controls: The Department of Housing, Planning, Community and Local Government is finalising draft Regulations requiring the Environmental Protection Agency to carry out Environmental Impact Assessment (EIA) for all existing and new large-scale peat extraction as part of its examination of IPC licence applications for the activity. The new licensing system will apply to large-scale peat extraction (>30ha) both inside and outside European sites and will streamline and consolidate environmental controls on peat production.

When the revised regulatory system for large-scale peat extraction is in place, it is intended that smaller scale commercial peat harvesting will be brought under a new local authority licensing system (separate from the planning consent system) incorporating EIA, as appropriate, and appropriate enforcement powers. Proposals for this new system will be drawn up in 2017 and will be the subject of public consultation before work begins on the legislation underpinning the new system in late 2017.

National Peatland Strategy: A National Peatland Strategy was published by the National Parks and Wildlife Service of the Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs in 2016. This Strategy aims to provide a long-term framework within which all of the peatlands within the State can be managed responsibly in order to optimise their social, environmental and economic contributions. As part of its actions the viability of peatlands for flood attenuation measures will be considered as part of the national programme of Flood Risk Management Plans being rolled out under the Floods Directive. Under the Strategy an examination of privately cutaway bogs will be undertaken to identify appropriate future uses, which will aim to harness their potential to contribute to environmental, economic and social wealth.

The Strategy expressly identifies peat harvesting as a pressure on water quality in certain areas and sets out high level actions to be undertaken to ensure peat production does not have a detrimental impact on water quality, and to ensure that peatlands can contribute positively to achieving the objectives of the WFD. These actions are:

- For all peatland related activities, it should be demonstrated that they do not, either individually or in-combination with other activities, adversely impact on the environmental objectives of the WFD, associated daughter Directives and national regulations.
- Peatland related activities should not significantly alter the environmental supporting conditions for Natura 2000 sites such that these cause a failure of the conservation objective for that designated habitat and by inference cause a risk of the WFD environmental objectives relating to protected areas not being met.

These actions, and all other actions set out in the strategy will be implemented by the Peatlands Strategy Implementation Group (PSIG) of which DHPCLG is a member, together with agencies such as NPWS, EPA, OPW and others. The PSIG will develop proposed structures to ensure the stated actions are undertaken and that the objectives of the strategy (and, by association, the WFD) are met.

Bord Na Mona Sustainability 2030 Strategy and Biodiversity Action Plan 2016-2021: Bord Na Móna has set out an action plan for the long-term rehabilitation of cutaway bogs, acknowledging obligations under the Water Framework Directive and the Habitats and Birds Directive. The plan is built around the commitment from Bord Na Móna to cease harvesting energy peat by 2030. Some key Bord Na Móna objectives under this Biodiversity Action Plan, include:

- Trialling ammonia attenuation/retention opportunities in cutaway peatlands,
- Developing a map of ecosystem goods and services for Bord Na Móna lands,
- Adding to the raised bog network under the Bord Na Móna Raised Bog Restoration programme,
- Develop best practice guidelines relating to rehabilitation and restoration of a range of peatland types,
- Control and monitoring of invasive species.

In addition, Bord Na Móna will be required to carry out an Environmental Impact Assessment on all of its peatlands, including appropriate assessment, where necessary, commencing in early 2017, which will consider, assess and regulate its impacts on WFD objectives.

7.4.2 Peatlands - principal actions for the 2nd cycle:

The following sets out the principal actions to address impacts on water caused by peatland harvesting.

1. The Minister for Housing, Planning, Community and Local Government intends to enact regulations in 2017 to (1) require the Environmental Protection Agency to carry out EIA for all existing and new large-scale peat extraction (>50ha) as part of its examination of IPC licence applications for the activity and (2) bringing smaller scale commercial peat harvesting under a new local authority licensing system incorporating EIA, as necessary.
2. The Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs will oversee the implementation of the Peatland strategy the principal aim of which is to provide a framework for determining and ensuring the most appropriate future use of cutover and cutaway bogs.
3. Bord na Mona will implement its Sustainability 2030 Strategy and Biodiversity Action Plan 2016-2021 which addresses the long-term rehabilitation of its cutaway bogs.
4. Bord na Mona, in conjunction with the EPA, will assess measures to mitigate the generation and impact of ammonia from their cutaway peatlands.

7.5 Protecting water bodies from invasive species

Invasive alien species (IAS) emerged as an area of particular concern during the public consultation processes for development of this plan. While legislative responsibility rests with DAHRRGA, EPA monitoring and local knowledge from local authorities and Inland Fisheries Ireland has confirmed the widespread presence of IAS nationally.

The potential impacts of IAS include the alteration of eco-systems (e.g. causing bank erosion), inhibiting access to water bodies, affecting land development and in some cases potential human health impacts. Ireland has experienced fewer issues with regards to IAS than other European countries, however, in line with increased globalisation many of the most problematic aquatic IAS were introduced within the last 20 years.

Efforts to control and eradicate IAS have had mixed success. While currently IFI has no statutory remit for IAS, it has been involved in effectively managing and reducing the coverage of curly waterweed in Lough Corrib from 100ha to less than 20ha. IFI also appears to have successfully eradicated the fish species chub (over the period 2006-2010). In contrast, control of Japanese Knotweed has been particularly difficult, including along river corridors. Similarly control of the Asian clam has also proven difficult.

Experience has confirmed that it is technically infeasible to remove most IAS once they become established. Therefore, our

priorities will be, firstly, to prevent the introduction of potential high impact IAS, and secondly, working to eradicate or effectively control IAS at the early stages before they become firmly established. A key challenge to achieving this is ensuring effective governance and organisation across multiple bodies.

7.5.1 Programme of measures to address aquatic and riparian IAS causing high impact to surface waters

Implementation of EU Regulation (1143/2014) on 'the prevention and management of the introduction and spread of invasive alien species': The 2015 EU Regulation (No. 1143/2014) on 'the prevention and management of the introduction and spread of invasive alien species' requires EU wide action to prevent, minimise or mitigate their adverse impacts. Currently 37 species are listed under the Regulation, 9 of which occur in Ireland, and these require particular attention. Additions to this list may be made in the coming years. The Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs (DAHRRGA) has overall responsibility for implementation of the Regulation although many actors will be required to ensure effective implementation.

Development of plans for priority Invasive Alien Species:

DAHRRGA will lead the development of Management Plans for the management of priority species listed in the EU regulation. These Plans will provide information on pathways, pathway mitigation, practical control and eradication, or containment if eradication is technically infeasible. Priority will be given to high impact IAS that are at an early stage in the invasion process and where eradication or significant control is possible.

Development and implementation of clear governance

arrangements and coordination mechanisms across relevant public bodies: Discussions are currently at an advanced stage, led by DAHRRGA, to put strong governance arrangements in place to manage IASs. This will involve the assignment of responsibility by Government for managing aquatic IAS in Ireland. It is intended to develop a coherent and co-ordinated national approach to IAS management and facilitate communication and collaboration with government departments, scientific and environmental institutions, NGOs, other stakeholders and the public. Because of the threat to waters both north and south cooperation with authorities in Northern Ireland is also essential. DAHRRGA will discuss the re-invigoration of cross-border cooperation on IAS with the Department of Agriculture, Environment and Rural Affairs in Northern Ireland.

Core tasks for dealing with IAS will include measures to address IAS monitoring, surveillance, early warning protocols, rapid response, control and biosecurity. The National Parks and Wildlife Service (NPWS) of DAHRRGA are providing funding to enable the National Biodiversity Data Centre to provide a service for the collation and dissemination of surveillance information, including early warnings on the risks and/or discovery of IAS. There will be enhanced cooperation between relevant authorities including IFI, NPWS, OPW, EPA, Local Authorities, SFPA and MI.

Harnessing community and stakeholder involvement and support to ensure the long-term sustainability of IAS projects:

Bottom-up community catchment initiatives offers significant potential for local action to address IAS. IAS is a cross-cutting issue that requires the participation of a wide range of community groups and stakeholders to be effective. Community engagement will be essential to achieving success.

Bodies such as IFI, NBDC, and NPWS will work with communities and stakeholder groups, including through the Local Authority Waters and Communities Office, to help build capacity and skills for IAS control and management. The availability of trained and committed community and stakeholder groups can provide valuable resources (e.g. citizen science, volunteers, IAS champions in clubs) to supplement public bodies efforts in the areas of IAS monitoring, surveillance, early warning systems, rapid response, control and biosecurity.

In addition, IAS has been included as a topic for inclusion in the GLAS training programme with a view to increasing both advisor and farmer awareness and knowledge of the threats posed by invasive species. Information notes on selected species are now available on DAFM's website.¹³

Development and promotion of national guidelines for biosecurity to prevent the introduction and spread of IAS, and to mitigate their impacts: Once strengthened governance arrangements for the management of IAS are in place assistance will be provided to relevant public bodies that work with water or watercourse management and maintenance to develop and implement biosecurity protocols for their staff to prevent the spread of IASs. These public bodies will also promote the use of these protocols more widely among other water users.

EPA funded research on IAS: The EPA has commissioned eleven research projects on invasive alien species to date¹⁴ and, where appropriate, will consider including research on aquatic Invasive Alien Species in future research calls. Such research may include themes such as, (1) Determination of the levels of interaction between IAS and native species in different aquatic and riparian situations and (2) elucidation of the direct and indirect effects that IAS have on ecological status in water.

EPA is currently funding research on IAS prevention, control and eradication led by Sligo institute of technology. The research will employ surveys and experiments to inform and improve biosecurity at potential IAS points of entry into Ireland, and also reduce secondary spread within the island.

7.5.2 Invasive Alien Species - principal actions for the 2nd cycle:

The following sets out the principal actions to address aquatic and riparian IAS causing high impact to surface waters:

1. EU Regulation (1143/2014) on 'the prevention and management of the introduction and spread of invasive alien species' will be implemented, with overall responsibility resting with DAHRRGA, with many other actors required to ensure implementation.
2. Clear governance arrangements for managing aquatic IAS in Ireland, including the assignment of responsibilities and development of agreed co-ordination mechanisms, will be put in place. This work will continue to be led by DAHRRGA and will seek to promote cross-border co-operation on the issue.
3. DAHRRGA will also lead on the development of management plans for priority IAS, with priority given to high impact IAS where eradication or control is possible.
4. National guidelines for biosecurity, to prevent the introduction and spread of IAS and to mitigate their impacts, will be developed
5. The relevant State bodies, in particular DAHRRGA/NPWS and IFI, and supported by LAWCO, will work to harness community and stakeholder involvement and support to ensure the long-term management and control of IAS.
6. EPA will continue to fund research on IAS including those impacting on the water environment.

7.6 Measures to protect and improve the physical condition of the water environment

Rivers, lakes and coastal waters in Ireland, as elsewhere in Europe, have a long history of alteration by humans for navigation, water and food supply, waste disposal, flood defence, settlement and power generation dating back centuries in some cases. These changes have resulted in direct alteration of these water bodies. By connecting areas of land, water bodies have also been indirectly affected by catchment-scale land use changes such as urban development, forestry and intensive agriculture. Alteration of water bodies has often been carried out with the best of intentions but without knowledge of the potential ecological consequences.¹⁵

There is increasing evidence that the physical condition (hydromorphology) of surface waters is as important to maintaining healthy ecosystems as the quality of the water sustaining them.¹⁶ Abnormally high siltation levels in particular are a cause for concern. In addition, physical barriers in rivers, such as impassable weirs, can impede the movement of water and sediment but can also prevent certain protected fish species from migrating, consequently affecting the health of these populations. Work is on-going across State Agencies to investigate and understand these further.

¹³ <http://www.agriculture.gov.ie/farmerschemespayments/glas/glastraining/>

¹⁴ <http://erc.epa.ie/smartsimple/>

¹⁵ River Restoration and biodiversity. Nature based solutions for restoring the rivers of the UK and Republic of Ireland (2016). A report by the IUCN.

¹⁶ EU FP7 Project REFORM (REstoring rivers FOR effective catchment Management: <http://reformrivers.eu/reform-results>)

7.6.1 Programme of measures on improving the physical condition of the water environment

Amended environment and planning regulations introduced since 2010: The 2011 Environmental Impact Assessment (EIA) (Agriculture) regulations (S.I. 456 of 2011) require an EIA screening and consent process for farmers with regard to three activities (i) restructuring of rural land holdings (ii) commencing to use uncultivated land or semi-natural areas for intensive agriculture and (iii) land drainage works on lands used for agriculture. Where it is intended to undertake any of these activities, and the proposed works a) exceed certain threshold values or b) the proposed works are to be carried out within (or may affect) a proposed NHA or a nature reserve, or c) the proposed works may have a significant effect on the environment, an application must be made to the DAFM. The assessment process considers whether the proposed works are likely to have a significant effect on the environment. Where risks are identified works are not permitted without DAFM consent. These regulations provide additional protection of waters from damaging physical alterations.

The 2011 planning and development (amendment) Regulations (SI 454) provided for the exempted development threshold for drainage of wetlands to be reduced from 20 hectares to 0.1 hectares. It also provided for the threshold for mandatory environmental impact assessment for such drainage to be reduced to 2 hectares.

Improvements in assessment methods and knowledge of the physical condition of surface waters: The experience from implementation of the WFD across the EU, and within Ireland, shows that there is a need to improve how hydromorphology is taken into account, specifically in relation to ecological status assessment, monitoring and characterisation, as well as in the design and implementation of measures.¹⁷ This is to be expected since this aspect of ecosystem quality has only recently been the subject of assessment, and methods are still evolving.

In the case of rivers the EPA has already taken steps to adopt the Morphological Quality Index (MQI) approach for assessing rivers to build on the existing site based, physical habitat assessment, the River Hydromorphological Assessment Technique (River-HAT). The MQI is a morphological based, multi-scale assessment which embraces the greater use of remote sensing. This assessment will provide greater insight into the physical condition of rivers, existing pressures impacting the physical condition of rivers and the rivers response to such pressures.

In relation to lakes, estuaries and coastal waters hydromorphological assessments have been largely limited to looking at the footprint of various infrastructural types (e.g. relative extent of modifications due to shoreline development) rather than the physical quality of the water body itself. The EPA is improving the assessment of hydromorphology for lakes,

transitional and coastal waters by using a combination of Geographic Information Systems (GIS) analysis and field survey. 61 lakes were reassessed using the new approach resulting in the downgrade of 9 lakes from high to good status compared to 5 lakes which were originally downgraded at the beginning of the cycle. Similarly improved assessment methods for marine waters have been trialled by the EPA. This has provided more accurate assessments of impacts. As a result, from a total of 29 marine water bodies assessed, the morphological status of 2 were upgraded and 7 were downgraded.

Inland Fisheries Ireland has identified the need to improve the assessment of barriers along rivers (e.g. weirs and dams) which may be impacting on a range of migratory fish species, including species protected under the Birds and Habitats Directive. The migration of the protected sea lamprey to spawning areas in particular has been impacted by barriers to migration.¹⁸ A recent IFI project on the river Nore identified and documented over 600 barriers to river connectivity which gives an indication of the potential scale of the issue nationally.¹⁹ IFI has identified the need for a national geo-referenced barriers inventory as an essential tool for infrastructure and environmental planning and has trialled protocols for barrier detection, inventory and assessment. IFI will lead a multi-stakeholder programme that will collect and collate data to support the development of this inventory of barriers nationally. These will be ranked according to the risk they pose to fish migration. This work will also contribute to a largescale EU project called AMBER.²⁰

During the first cycle IFI has carried out mitigation works on circa 30 man-made barriers to improve fish passage. The beneficial results of these mitigation measures have been to open access to upstream catchment areas for fish species and to eliminate the 'waiting time' for migratory fish. In the case of natural barriers, such as waterfalls, these are seen as an integral part of the channels where they occur. Modification of such 'barriers' is not considered consistent with WFD objectives.

There are multiple potential benefits from adopting the more comprehensive approach of measuring the physical condition of surface waters directly at a larger scale. Benefits include a more comprehensive and objective means of measuring departure from natural conditions thus facilitating the establishment of criteria for regulating future development involving modifications to surface waters. It will also provide the basis for design criteria for future habitat restoration projects. An additional benefit will be the provision of a more robust and objective basis for supporting decisions on whether a water body is so significantly modified that it should be considered for designation as a Heavily Modified Water Body (HMWB). Currently there are 35 HMWBs nationally. Once the more comprehensive approach to measuring the physical condition of surface waters is developed a review of HMWBs will be carried out by the EPA. An improved assessment of hydromorphology will also inform the assessment of flood hazard, thus supporting Flood Risk Management Plans.²¹

¹⁷ Terms of Reference for Ad-hoc Task Group on Hydromorphology (Draft dated February 2016). Common Implementation Strategy for the Water Framework Directive and the Floods Directive - Work Programme 2016-2018

¹⁸ Rooney, S.M., Wightman, G.D., O Conchuir, R. and King, J.J. (2015) : Behaviour of sea lamprey (*Petromyzon marinus* L.) at man-made obstacles during upriver spawning migration: use of telemetry to access efficacy of weir modifications for improved passage. *Biology and Environment : Proc. R. Ir. Acad.* 115 B, 1-12.

¹⁹ Gargan, P. G., Roche, W. K., Keane, S., King, J. J., Cullagh, A., Mills, P. and O'Keeffe, J. (2011) Comparison of field- and GIS-based assessments of barriers to Atlantic salmon migration: a case study in the Nore Catchment, Republic of Ireland. *J. Appl. Ichthyol.* 27 (Suppl. 3) (2011), 66-72

²⁰ The AMBER project (Adaptive Management of Barriers in European Rivers) is a multi-disciplinary research project involving 20 partners from 11 countries including Ireland, funded from the European Union's Horizon 2020 Research and Innovation Programme.

²¹ European Communities (Assessment and management of flood risks) Regulations 2010 (S.I. No. 122 of 2010)

There is increasing evidence that the impairment of the physical integrity of rivers, lakes and transitional waters can impact negatively on their ecosystems and hence their ecological status. A key focus during this second cycle will be to build the evidence base to determine the significance of physical conditions in surface waters to supporting good and/or high ecological status. The EPA with the support of other agencies, will work together to develop the evidence base.

To maintain and, where necessary, restore physical conditions of surface water to support good and/or high ecological status environmental standards will need to be developed. Preliminary analysis of river hydromorphological assessments and Q-values, for example, suggests that a River-HAT score of >0.6 (on a scale of 0 to 1) may be required to support good ecological status. A score of ≥0.7 may be required to support high ecological status. The EPA, with support from other state agencies, will improve our understanding of the hydromorphology of surface water bodies, and develop appropriate environmental supporting conditions during this second cycle

Mitigation measures incorporated in the OPW drainage maintenance programme: Under the 1945 Arterial Drainage Act, the Office of Public Works (OPW) is obliged to carry out maintenance work on the network of arterially drained channels. Since 1990 the OPW has worked with IFI and its predecessors to develop maintenance strategies that would reduce adverse habitat impact and that could provide habitat benefit.²² This has been compiled into a series of Environmental Management Protocols and Standard Operating Procedures.²³ OPW undertakes maintenance on approximately 2,000 km of channels in its network annually which follows the environmental drainage maintenance environmental procedures to minimise environmental impact. The guidance provides potential for significant retention of riparian habitat and also for alteration of instream hydromorphology in appropriate locations.²⁴ This latter is achieved through diggings that can alter the uniform cross-section and/or longitudinal profile of the channel. This is a zero-cost option as the machine is on site. The reduced floodplain connectivity in arterially drained channels leads to reduced overall River-HAT scores for the area examined. However, the channel may achieve Good and High scores for some of the other 8 attributes scored in River-HAT assessments. The OPW's environmental guidance facilitates achieving Good and High scores for several of the hydromorphology attributes assessed.

Over the second cycle the OPW will carry out maintenance on 2,000 km of channel each year. Robust implementation of the environmental procedures has the potential both to minimise adverse environmental impacts and to effect positive hydromorphological change in drained channels. The OPW initiated

a new programme called the Environmental River Enhancement Programme (EREP) with IFI in 2008 and this is currently operational. The EREP focus is on achieving hydromorphological improvement through two main strands - implementation of specific river enhancement works such as importing spawning gravels and implementation of the environmental methods in channel maintenance such as altering the channel bed to form more natural riffle pool glide sequences. This programme will continue during the second cycle.

Lower Shannon – examine the feasibility of improving fish migration in the lower Shannon catchment: The feasibility of improving fish migration on the Shannon catchment is being examined by IFI, Irish Water, the NPWS, ESB and the DHPCLG. Fish migration, both upstream and downstream, for salmon, eels, sea trout, twaite shad, allis shad and sea lamprey in the Shannon is impacted by the presence of the Parteen dam which was constructed in 1929 as part of the Shannon hydroelectricity scheme. Fisheries experts believe that construction of an appropriately designed bypass channel will benefit the entire Shannon system, enhancing stocks of the above protected native fish species. This will contribute to the objectives of both the Habitats Directive and the Water Framework Directive. Further assessment of options will be progressed during 2017.

Supporting research projects: Several research projects have been initiated by the Environmental Protection Agency in response to the requirement to address the physical condition of surface waters. These include the SILTFLUX project²⁵ which aims to develop a better understanding of fine sediment flux in Ireland and the ecological impacts of siltation. The COSAINT project²⁶ aims to assess the impacts of cattle access to streams on the ecology of those streams as well as evaluating the environmental effectiveness of various approaches to excluding cattle. The DETECT project²⁷ is designed to try to disentangle the effects of multiple environmental stressors acting on rivers and lakes including the physical deterioration of habitats. The RECONNECT project²⁸ aims to develop a methodology for prioritising barrier modification or removal in order to improve both fish movement and hydromorphological conditions. Outputs from this will support the IFI programme mentioned previously in creating a national catalogue of barriers to fish migration ranked according to risk.

²² KING, J. J., O' GRADY, M. F. and CURTIN, J. (2000) The Experimental Drainage Maintenance (EDM) programme: engineering and fisheries management interactions in drained Irish salmonid channels. *Verh. Internat. Verein. Limnol.* 27, 1532-1535.

²³ <http://www.opw.ie/media/OPW%20Environmental%20Management%20Protocols%20&%20SOPs%20April%202011.pdf>

²⁴ King, J.J., Lehan, B.M., Wightman, G.D., Dooley, R. and Gilligan, N. (2011) Development and implementation of environmental protocols in river maintenance in Ireland. *Water and Environment Journal*, 25, 422 - 428.

²⁵ SILTFLUX: <http://77.74.50.157/siltflux/>

²⁶ COSAINT: <https://www.dkit.ie/centre-freshwater-environmental-studies/research-projects/lake-catchment-management/cosaint-project>

²⁷ DETECT: <https://www.afbini.gov.uk/articles/detect-project>

²⁸ RECONNECT: <http://www.ucd.ie/reconnect/>

7.6.2 Protecting and improving the physical condition of the water environment - principal actions for the 2nd cycle:

The following sets out the principal actions related to hydromorphology;

1. Existing regulations providing for EIA to (i) mitigate the impact of planned land-use changes on waters and (2) which reduced the threshold for exempted development threshold for drainage of wetlands from 20 hectares to 0.1 hectares will continue to be implemented.
2. The EPA will improve assessment methods and knowledge of the physical condition of surface waters, including; developing a Morphological Quality Index for Irish rivers and enhanced use of GIS for assessing lakes, transitional and coastal waters.
3. The EPA, with the support of other agencies, will also develop the evidence base regarding the link between physical integrity of water bodies and ecological status and defining appropriate environmental supporting conditions with regard to hydromorphology.
4. Mitigation measures incorporated in the OPW drainage maintenance programme will be applied for all such works.
5. IFI will lead a multi-stakeholder programme that will collect and collate data to support the development of an inventory of barriers to fish migration nationally.
6. The feasibility of implementing measures to improve fish migration in the Shannon catchment will be examined, with all relevant State bodies working co-operatively.
7. Four EPA research projects related to hydromorphology (SILTFLUX, COSAINT, DETECT and RECONNECT) will be completed and the outputs used to inform future actions to mitigate the impact of hydromorphological impacts.

7.7 Addressing abstraction pressures

The Water Framework Directive requires that abstractions of surface water or groundwater which are likely to have a significant effect on water status are regulated. The Department of Housing, Planning, Community and Local Government is currently reviewing how best to address this requirement in a proportionate and efficient way. Whilst no decision on an approach will be made until thorough public consultation has been undertaken, it is anticipated - given the relatively low level of abstraction pressure and abundance of rainfall in Ireland - that a proportionate regime for the regulation of relevant abstractions can be developed without imposing an unnecessary regulatory burden.

It is envisaged that any such a regime would focus on the most significant abstractions recognising that the Directive does not require controls over abstractions that do not have a significant impact on the status of water bodies. It is important to note in this context that only 4% of water bodies nationally have been identified as potentially at risk of over abstraction.

7.7.1 River Basin District characterisation and abstraction risk assessment

For the purpose of the current river basin management plan covering the period 2018-2021, EPA has undertaken a quantitative assessment of abstraction amounts and compared them to estimated natural water flows in rivers and water levels in lakes and groundwater bodies. The abstraction amounts used for the assessment are based on best available information of known abstractions from a recently collated EPA abstractions database. The database includes some 2,630 abstractions of which approximately 1,000 have an abstraction rate greater than 100 cubic meters per day. Of these larger abstractions, 125 are associated with licensed industrial facilities. The database includes 1,286 public drinking water supplies, 635 privately sourced group water supplies and some 700 abstractions associated with IPC/IE installations, bottled water plants, power generation plants, quarries, mines, schools and private supplies.

The assessment shows that the level of risk due to abstraction pressures in Ireland is low. Nationally, out of a total some 3,192 river and 812 lake water bodies, 98 river (3%) and 73 lake (9%) water bodies were identified as potentially at risk of over-abstraction. Out of a total of 513 groundwater bodies, 23 (4%) were identified as potentially at risk. A more detailed case-by-case assessment is now needed to confirm if these 194 water bodies are in fact failing to meet their objectives under the WFD due to abstraction pressures. Further assessment will be undertaken during the course of this river basin planning cycle up to 2021. Where necessary, the required corrective measures will be identified and steps taken to address such pressures where they arise.

7.7.2 Programme of measures to address abstraction pressures

Several developments have taken place to improve our knowledge and understanding of the risks from water abstractions which will contribute to more sustainable management of water abstractions in the longer term. These developments include (1) the updating of the water abstractions database in 2016 by the EPA, (2) the publication of EU guidance²⁹ on ecological flows in 2015 which provides clarification in relation to the flow conditions needed to support ecological status, (3) a review of the national hydrometric programme by the EPA which provides the basis for river flow and lake level estimations which are critical to managing abstraction pressures and (4) the completion of bathymetric surveys by EPA for 53 lakes with water abstractions, which will enable volumes and turnover rates to be more accurately estimated.

Upgrading and maintenance of the hydrometric network:

Reliable flow and/or level estimates are required for individual water bodies in order to determine the cumulative impact of abstractions on water bodies. To provide for this the EPA has responsibility for the National Hydrometric Monitoring Programme under Section 64 of the EPA Act (1992). The Programme consists of 398 flow monitoring and lake level monitoring stations. 242 are operated by the EPA and local authorities, 147 by the OPW and 9 by the ESB.

The EPA is currently reviewing the National Hydrometric Programme with respect to future needs. The review is addressing the definition of the national network, identification of the responsibilities for other hydrometric data providers and identification of the maintenance requirements for sites in the network that are the responsibility of the EPA and local authorities. The EPA is also reviewing modelling needs to facilitate the making of water balance assessments in order to support future water resource management decisions.

Register of water abstractions: Building on the existing EPA abstractions database, the establishment of a comprehensive and maintained national register of water abstractions is essential in order to assess and manage the potential risk of over-abstraction on an on-going basis. It is therefore proposed, in the short to medium term, to advance legislative proposals establishing a requirement to maintain a register of abstractions, including abstraction amounts, for all surface water and groundwater abstractions greater than 25 cubic meters per day.

Consultation on, and development of, appropriate regulation for abstractions:

In addition to developing a national register of water abstractions, it will be necessary to develop an appropriate regulatory framework for relevant abstractions. This will be integrated with the river basin management process and will serve to manage overall water abstraction at the water body level or catchment scale. It is envisaged that the proposed management framework will apply to those abstractions which are required to register; that is abstractions greater than 25 cubic metres per day. The framework will comprise a system of general binding rules for the majority of registers abstractions and provide for the individual licensing of the more significant abstractions, typically where the abstraction is greater than 250 cubic meters per day. The proposed approach will be subject to separate public consultation to ensure the regulation of abstractions is both effective and proportionate and does not impose unnecessary regulatory burden.

7.7.3 Addressing water abstraction pressures - principal actions for the 2nd cycle

The following sets out the principal actions aimed at addressing abstraction pressures for the 2nd cycle:

1. The EPA is currently reviewing the national hydrometric monitoring programme. From the review it will identify the revisions necessary to provide the required flow and water level estimates needed to assess the impact of abstraction pressures on surface water and groundwater bodies.
2. The EPA will undertake further assessment of the 4% of water bodies identified as potentially at risk of over-abstraction. This will establish if any of these water bodies are failing to meet their objectives under the WFD and will advise on appropriate measures to mitigate the pressures.
3. The Department of Housing, Planning, Community and Local Government will in 2017 progress legislative proposals to establish a comprehensive and maintained register for water abstractions greater than 25 cubic meters per day.
4. The Department of Housing, Planning, Community and Local Government will consult on a proportionate and risk-based framework for the regulation of relevant abstractions with the view to progressing the necessary legal and administrative regulation to ensure continued sustainable use of our water resources.

7.8 Overview measures to address other pressures

The previous sub-sections set out the programme of measures aimed at addressing the most important significant pressures within the river basin district. This subsection sets out the proposed measures to address other pressures, namely, land use and planning, flood risk, climate change, planned mitigation measures for lead in drinking water, and hazardous chemicals.

7.8.1 Land use planning and water

The River Basin Management Plan recognises the need for alignment and integration with the planning system in order to ensure effective water management and compatibility between planned growth and environmental sustainability.

Planning in Ireland is critically important to the wellbeing of our water bodies through plan making at a strategic level or in relation to careful consideration of individual applications for development seeking planning permission. The planning system therefore makes a significant contribution to water objectives by ensuring that development that could pose a risk is avoided in the first instance, where feasible and by including appropriate planning conditions in planning permissions for new development.

²⁹ "Ecological Flows in the Implementation of the Water Framework Directive, CIS Guidance Document No. 31, Technical Report 2015-086, European Commission, 2015.

The planning system also has influence across a wide range of sectors, both directly and indirectly and interacts with many common issues that are pertinent to effective river basin management including:

- water services;
- landscape;
- flood risk planning;
- coastal and marine management; and
- climate action and adaptability.

Within the planning hierarchy there are a number of national, regional and local plans that can impact on water management and water quality. These set the spatial context for sustainable development and growth as well as approaches and measures to reduce and mitigate their environmental impacts.

At the apex of the planning hierarchy will be the National Planning Framework (NPF), the Government's successor to the National Spatial Strategy. Below the NPF will be three Regional Spatial and Economic Strategies (RSEs) with which, in turn, county and city development plans must be consistent.

A draft of the NPF, which is subject to Strategic Environmental Assessment (SEA), will be subject to public consultation in 2017. Thereafter the three RSEs, which are also subject to SEA, will be subject to public consultation.

The aim of these planning policy documents is to set long-term national, regional and local development frameworks within which government departments and agencies, the three regional assemblies and local authorities, as well as wider private sector and community interests, will work together to ensure proper planning and sustainable development and in particular the optimal development of the country as a whole, nationally, regionally and at local level.

The NPF and RSEs will provide specific guidance and a framework for:

- Future population and employment growth and sustainable development
- Spatial planning of urban and rural areas, including distinctions between the differing roles of settlements.
- Investment in critical national infrastructure to support sustainable growth.
- Planning at regional and local levels including the co-ordination of regional spatial and economic strategies and city and county development plans.
- Co-operation and coordination across international borders, including our territorial waters.
- Approaches and measures to reduce and mitigate environmental impacts, including water quality, biodiversity and habitat loss as well as greenhouse gas emissions and address the necessity of adaptation to climate change

A key objective for the planning system is to ensure the aims of river basin management are reflected in relevant policies and implementation actions at the various levels of plans. In a reciprocal sense, the river basin management planning process will also identify implementation objectives which the planning system can help address. Therefore both the river basin management and spatial planning processes will work together in identifying and progressing common aspirations regarding the achievement of environmental objectives and targets.

Recognising the above and to ensure greater awareness, alignment and integration of sustainable water management issues, the planning system has undergone a number of changes in recent years. These changes include amendments to planning legislation to improve integration between the planning system and water management³⁰, regulations to control the drainage and reclamation of wetlands and enhanced guidance regarding activities such as quarrying and management of peatlands.

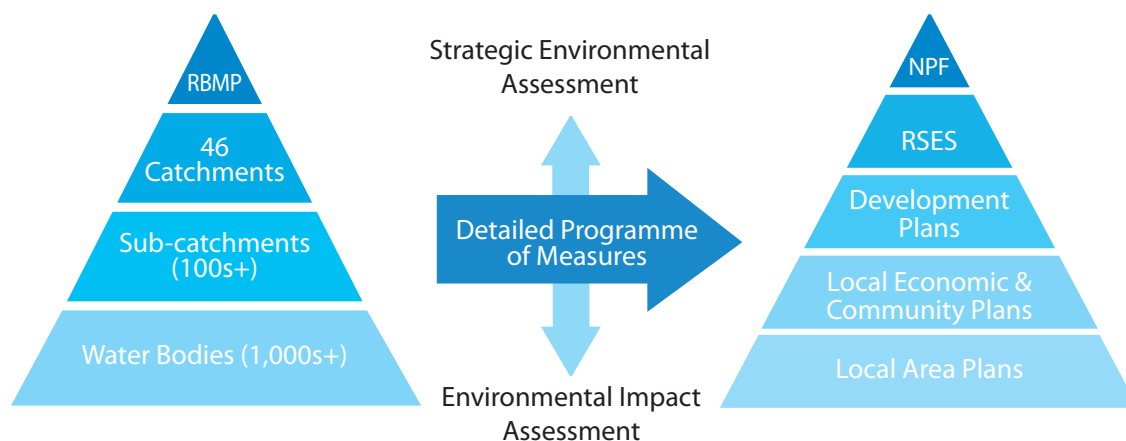


Figure 7.1: Hierarchical Structure of RBMPs and Planning Policy

³⁰ The Water Framework Directive is cited in planning legislation at Section 1A of the Planning and Development Act 2000, as amended by the Planning and Development (Amendment) Act 2010. Section 1A confirms that effect or further effect, as the case may be, is given by that Act to European Union Directives, including "Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy". Section 10(2)(cb) of the same Act, relating to the content of development plans, also states that every development plan shall include objectives for: "the promotion of compliance with environmental standards and objectives established— (i) for bodies of surface water, by the European Communities (Surface Waters) Regulations 2009; (ii) for groundwater, by the European Communities (Groundwater) Regulations 2010; which standards and objectives are included in river basin management plans (within the meaning of Regulation 13 of the European Communities (Water Policy) Regulations 2003)".

A key policy instrument to ensure that plans, policies and projects are better aligned is the use of Strategic Environmental Assessment (SEA) at a strategic plan and programme making level and Environmental Impact Assessment (EIA) at the project level, including planning applications for developments of strategic importance under the Planning and Development (Strategic Infrastructure) Act 2006.

The main objective of the SEA Directive is to:

“provide for a high level of protection for the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes with a view to promoting sustainable development”.

SEA assessments are undertaken before plans or programmes are adopted so the impact of the proposed plans and their objectives on the environment, including water bodies, can be evaluated and used to inform strategic growth options and to ensure that the built environment responds to the sensitivities and requirements of the wider natural environment. The NPF, RSEs and County and City Development Plans are all subject to mandatory SEA in which case the consideration of impacts of the proposed plans on water quality and RBMP is one of the key elements of the SEA process.

At the detailed stage of development management, EIA will include consideration of potential impacts and risks to water objectives as considered within planning policy documents, all of which have undergone SEA, with due consideration of the RBMP, and any necessary avoidance and mitigation measures will be attached.

In addition to legislative changes, the Department has published guidance in 2008 on *‘River Basin Management Planning - A Practical Guide for Public Authorities’* by the Department of Housing, Planning, Community and Local Government, as well as the *‘Flood Risk Management Guidelines for Planning Authorities’* in 2009. These have been effective in facilitating the making of better informed decisions for the benefit of people and the environment.

With reference to a commitment given by the Department in the 2008 *‘Practical Guide for Public Authorities’*, the Department will, in conjunction with the development of the RBMP, prepare high level guidance for planning authorities on the relationship between physical planning and river basin management planning. This guidance will provide a methodology for planning authorities to ensure that relevant plans and planning decisions are consistent with River Basin Management Plans and the requirements of the Water Framework Directive.

The preparation of this guidance will include input from the Office of Public Works, Irish Water, the Environmental Protection Agency, the County and City Management Association and others, as required. In preparing guidance, the Department will also have regard to relevant developments at EU level, including relevant guidance from the EU Commission.

7.8.2 The assessment and management of flood risks

The Office of Public Works is the competent authority in Ireland for the EU ‘Floods’ Directive, which requires the Member States to:

- Undertake a Preliminary Flood Risk Assessment (PFRA) to identify areas of potentially significant flood risk (referred to as Areas for Further Assessment, or AFAs);
- Prepare flood hazard and risk maps for the AFAs; and,
- Prepare catchment based Flood Risk Management Plans (FRMPs) setting objectives for managing the flood risk within the AFAs and setting out a prioritised set of measures for achieving those objectives.

The OPW has been implementing the Directive primarily through the national Catchment-based Flood Risk Assessment and Management (CFRAM) Programme. This has included the preparation 29 Draft Flood Risk Management Plans (FRMPs) for the country, which have been subject to SEA and plan-level AA and were prepared in coordination with the implementation of the WFD, as set out in the FRMPs. The Draft FRMPs were published for consultation during the period July - October 2016.

Many communities at risk from flooding around Ireland currently do not benefit from flood protection. The Draft FRMPs therefore include many measures comprising proposed structural flood protection works aimed at addressing this gap to reduce the risk to people and property. However, such works, if not designed and implemented carefully, have the potential to have a detrimental impact on the hydromorphology and, potentially, on the ecological status of water bodies. These potential impacts are, in most cases, relatively minor and short-term, for example, the risk of increased sediment during construction, which can be mitigated through appropriate actions during implementation. In some cases however, the works may have a more significant or permanent impact, such as major changes to physical structure due to channel deepening or widening.

An assessment of the most appropriate measures to reduce or manage the flood risk within each catchment and each of the 300 Area for Further Assessment (AFA) around Ireland has been undertaken. One aspect of the assessment looked at the potential impact of possible measures on water bodies achieving WFD objectives. This assessment has determined which measures might cause impact in terms of the objectives of the WFD, varying in scale and duration. It has also considered the overall impacts and benefits to the environment and to society across all objectives as part of the consideration of viable alternatives for managing flood risk for the community. The initial high level assessment found that of the new structural measures proposed in the Draft FRMPs, more than two-thirds are likely to have a positive impact, no impact, or only a short-term negative impact, which should typically be mitigated at detailed design and implementation stage. Approximately 20% of the structural measures may have medium-term or recurring impacts on hydromorphology, although they may not cause a deterioration in status or impede the

achievement of GES, and mitigation measures may be available to avoid or manage such potential impacts. Finally, less than 10% may cause a permanent or long-term impact. These figures are based on a high level assessment and are indicative only. Project-level assessments (i.e. the more detailed analysis required prior to planning or Exhibition) may well result in amendments to the projected impacts.

Following approval of the FRMPs, the next stage to progress the proposed flood risk management measures will be to undertake more detailed assessment and design at a project-level, before submitting the proposals for Exhibition (under the Arterial Drainage Acts) or planning permission. This assessment will normally include an Environmental Impact Assessment (EIA) and, where necessary, a project-level Appropriate Assessment (AA) in line with the Birds and Habitats Directives. The assessment will also enable a detailed appraisal of the potential impacts of the final measure on the water body hydromorphology and status to be undertaken including, where necessary, a detailed appraisal under Article 4(7) of the WFD (derogation related to deterioration caused by new modifications). This will build on the initial work done during the preparation of the Draft FRMPs. The work planned by EPA to improve assessment methods for river morphology (See section 7.6 on physical condition) has the potential to assist in (1) assessing the potential impact of flood management measures on WFD objectives, (2) identifying the most appropriate mitigation measures and (3) supporting decisions on the application of Article 4(7) derogations. The EPA and OPW will work together to develop technical methods to assist in the assessment of impacts from flood protection schemes.

7.8.3 Climate change mitigation and adaptation:

The impact of climate change on waters was raised as a Significant Water Management Issue in the consultation undertaken in 2016. For Ireland, climate change impacts are projected to increase in the coming decades and could include the following:

- sea level rise;
- more intense storms and rainfall events;
- increased likelihood and magnitude of river and coastal flooding;
- water shortages in summer in the east of the country;
- adverse impacts on water quality; and
- changes in distribution of plant and animal species on land and in the oceans

The main climate change impacts expected in Ireland will result from changes in air and soil temperature, changes in rainfall patterns and extreme events. The mean annual surface air temperature has increased by approximately 0.8°C over the last 110 years and the beginning of the growing season for certain species is now occurring up to 10 days earlier.³¹ Average annual national rainfall has increased by approximately 60mm or 5 per cent in the period 1981 to 2010, compared to the 30-year period 1961 to 1990. Typically climate models project Ireland will get wetter in Winter and drier in Summer (Nolan, 2015). However, confidence in this

statement is low in scenarios where climate change is successfully limited to below 2°C and the large uncertainty in modelling of climate change for Ireland at the interface between the North Atlantic and European continent. Extreme events are likely to increase in intensity and frequency. Precipitation may occur in more intense downpours together with longer dry spells, impacting on run-off volumes and water availability between rainfall events. These changes in the environment will require adaptation to climate change. Adaptation refers to dealing with the impacts of climate change and involves taking practical actions to manage risks from climate impacts, protect communities and strengthen the resilience of the economy. It is a long term process and will need to be taken into account with regard to agriculture, energy, forestry, heritage, transport and flood defence in order to minimize the environmental, economic and social impacts on the country.

Ireland’s first National Climate Change Adaptation Framework (NCCAF) (2012), aims to ensure that adaptation actions are taken across key sectors and also at local level to reduce Ireland’s vulnerability to climate change. The Framework requires the development and implementation of sectoral and local adaptation plans which will form part of the national response to the impacts of climate change. Each relevant Government Department (or State Agency, where appropriate) are required to prepare adaptation plans for their sectors. Twelve areas were identified for action in total including Transport, Flood Defence, Agriculture and Energy. The Climate Action and Low Carbon Development Act, 2015 puts the development of National Climate Change Adaptation Frameworks and Sectoral Adaptation Plans on a statutory basis. The Act also establishes the Climate Change Advisory Council to advise ministers and the government on climate change matters.

The first NCCAF has to be approved by Government at the same time as the river basin management plan will be finalised (i.e. by the end of 2017). The DCCAE is responsible for developing the NCCAF. Following its approval, the Act requires the Government to request all relevant Government Ministers to prepare sectoral adaptation plans covering the relevant sectors under their remit. Some sectors that are relevant to River Basin Management Plans and the Lead Department for preparation of the Sectoral Adaptation Plan, in each case, are listed in table 7.1 below:

Sector Level	Lead Department for Sectoral Adaptation Plan
Water	Department of Housing, Planning, Community and Local Government
Agriculture, Forestry	Department of Agriculture, Food and the Marine
Biodiversity	Heritage Division of the Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs
Flood Defence	Office of Public Works

Table 7.1: Lead Departments for climate change sectoral adaption plans of relevance to the RBMP

³¹ <http://www.met.ie/climate-ireland/climate-of-ireland.asp>

In the context of this draft plan, the Minister will actively work with the DCCAE to ensure that all relevant actions that can be identified relating to the water environment are addressed in the first NCCAF including progressing resilience of water and water treatment facilities and appropriate actions by land owners and managers.

7.8.4 National Lead Strategy for Drinking Water

The legal limit for lead in drinking water was lowered in December 2013 from 25 micrograms per litre to 10 micrograms per litre (also expressed as parts per billion).

The Irish Government published a National Strategy to Reduce Lead in Drinking Water³² on 9th June 2015. In response to the recommendations of this strategy, Irish Water prepared a detailed Draft Lead in Drinking Water Mitigation Plan³³ to identify measures to mitigate the risks to human health posed by the presence of lead in drinking water. The statutory consultation on the draft plan and associated environmental reports closed in September 2016 and a final plan will be published in the near future.

Based on current available data, Irish Water estimates that lead pipework exists in approximately 180,000 residential properties in Ireland as well as in many commercial and public buildings. The draft plan recognises that the most effective long-term strategy is to remove all lead supply pipes. However, as it will take many years to achieve this target, Irish Water proposes to introduce corrective water treatment, as an interim mitigation measure, at up to 400 Water Treatment Plants. This corrective water treatment will include orthophosphate treatment and pH adjustment, over the short to medium term, in high risk water supplies where it is technically, economically and environmentally viable to do so. It is planned to roll out this programme over 3 years, subject to site-specific environmental assessments.

Phosphorus has the potential to impact on the environment and in particular water bodies, through the process of nutrient enrichment and eutrophication.

Therefore, it will be necessary to consider the risk of environmental impact and the pathways by which the added phosphorus may reach environmental receptors and possible mitigation measures to offset any such impact.

A site specific environmental assessment will be carried out on each water supply zone including an Appropriate Assessment. Where a significant risk to environment receptors associated with orthophosphate treatment is identified, the necessary environmental protection measures will be implemented.

7.8.5 Hazardous Chemicals

As stated previously, apart from two ubiquitous substances (mercury and PAHs) the amount of non-compliances with the Environmental Quality Standards for Priority Substances and Priority Hazardous Substances is very low in Ireland and not of

significant concern. The main exceedances arose due to naturally occurring metals in known mineral rich areas, particularly where mining has been carried out.

A number of pesticides, including Mecoprop, MCPA (a herbicide used to control the growth of rushes) and 2,4-D have been detected at low concentrations at a large number of river monitoring sites during routine monitoring. The significance of the pesticide levels detected is being assessed especially in the context of drinking water protection. Exceedances of drinking water standards have been found, primarily due to MCPA.

Action is being taken to collect and remove hazardous substances from the environment. The EPA, Teagasc, the DAFM, local authorities and waste contractors are all collaborating in a joint initiative to facilitate the collection, recovery and disposal of farm hazardous waste. The campaign has been extensively advertised and promoted by many of the project partners including Irish Farmers' Association, Irish Creamery Milk Supplier Association, Bord Bia, the Irish Farm Film Producers Group, some agricultural co-operatives and agricultural merchants. Between 2013 and 2014 nearly 3,000 farmers used the collection centres and a total of 264 tonnes of farm hazardous waste were collected. This included 32 tonnes of pesticides consisting of insecticides, fungicides and herbicides many of which are extremely toxic to both human health and the environment. Farmers paid for the service, which confirms clearly that farmers want to manage these wastes in an appropriate manner and are willing to pay for the safe recovery and disposal of these wastes where a service exists. Other actions are being taken under Ireland's National Implementation Plan for the Stockholm Convention on Persistent Organic Pollutants (POPs) which inter alia, aims to reduce the presence and emissions of certain substances of concern in the water environment by banning certain hazardous pesticides and industrial chemicals in addition to requiring the development of emission inventories and monitoring programmes for releases of unintentional POPs (dioxins and furans, PCBs and HCB) which may result from certain combustion and industrial activities.

Changes to the EU water legislation have taken place since the commencement of the first cycle of plans. Directive 2013/39/EU revised the environmental quality standards for a number of priority substances, added new substances to the original list, and include additional environmental quality standards for biological quality elements. The revised Priority Substances Directive also provide for the establishment of a Watch List to monitor concentrations of emerging pollutants and other substances of concern in the aquatic environment. The Minister made regulations the European Union Environmental Objectives (Surface Water) (Amendment) Regulations 2015 (SI 386 of 2015) to give national effect to the directive. The EPA has commenced monitoring for the Watch List substances and is planning on undertaking an advance study during 2017 to assess the presence of the list of substances contained in the revised Priority Substances Directive in Irish waters to inform future monitoring and assessment of their importance.

³² <http://www.housing.gov.ie/water/water-quality/lead-drinking-water/national-strategy-reduce-lead-drinking-water-published>

³³ <https://www.water.ie/projects-plans/lead-mitigation-plan/Draft-Lead-in-Drinking-Water-Mitigation-Plan-July-2016.pdf>

Further candidate Priority Substances and Priority Hazardous Substances continue to be considered at EU level. EPA is participating in this work to ensure that the WFD monitoring programme continues to be fit for purpose and that relevant substances are considered.

7.8.6 Addressing other significant pressures - principal actions for the 2nd cycle

The following sets out the principal actions aimed at addressing other significant pressures for the 2nd cycle:

1. The forthcoming National Planning Framework will integrate with this River Basin Management Plan. To support this, following the adoption of the RBMP and completion of the NPF, DHPCLG will prepare high level guidance for planning authorities on the relationship between physical planning and river basin management planning. This guidance will provide a methodology for planning authorities to ensure that relevant plans and planning decisions are consistent with River Basin Management Plans and the requirements of the Water Framework Directive.
2. OPW will undertake project level assessment of all relevant proposed physical flood management measures before submitting plans for exhibition, including, where necessary, a detailed appraisal under Article 4 of the WFD.
3. DHPCLG will work to ensure that relevant actions relating to the water environment are addressed in the National Climate Change Adaptation Framework.
4. Site specific environmental assessments will be carried out on each water supply zones where orthophosphate treatment is proposed as part of the National Lead Strategy for Drinking Water.



Section 8:

Measures for protected areas & high status waters

As outlined in sections 4 and 5, significant progress remains with regard to meeting the requirements for our protected areas. This section sets out the planned programme of measures for drinking water protected areas, bathing waters, shellfish waters, nutrient sensitive areas and finally for SACs with water dependency.

8.1 Achieving the requirements for Drinking Water Protected Areas:

The Water Framework Directive requires the identification of Drinking Water Protected Areas (DWPAs). These are reservoirs, rivers and the groundwater bodies from which water is abstracted to provide water for people to drink. Where necessary this raw water is treated to purify it to the required drinking water standard. In order to protect water from contamination from substances leading to the need for more treatment the risks need to be identified. Where risks are identified Safeguard Zones may be delineated. These zones are areas where the land use may be causing pollution of the raw water. Actions can be targeted in these zones to address pollution so that additional treatment of raw water can be avoided.

8.1.1 Public water supplies – Drinking Water Safety Plans

Irish Water currently operates 918 water treatment plants abstracting from some 1,277 water sources split approximately 57% groundwater and 43% surface water. These public water supply schemes serve 83% of the population. High level risk assessment has already been applied as part of the 2017-2021 investment planning process to help develop a national picture of investment needs. Irish Water plans to prepare a full Drinking Water Safety Plan (DWSP) risk assessment for each water supply, but this will take a number of investment cycles to complete. A DWSP identifies all potential risks to the water supply, from catchment to consumer, and mitigation measures and procedures are put in place to manage these risks. Each DWSP will look at six elements namely, source, raw water, treatment, distribution, customer and management.

Pending the completion of full DWSPs, Irish Water is working on a programme to complete the Source Risk Assessments. The purpose of these risk assessments is to identify drinking water sources which may require measures to protect the drinking water source and avoid the need for additional future purification treatment. Table 8.1 sets out Irish Water's planned programme for the completion of 353 Source Risk Assessments by the end of 2021, with the remainder being carried out in the next investment cycle.

To assess appropriate mitigation measures, such as integrated catchment management and the design of drinking water treatment plants, Irish Water has commenced a programme of raw

water monitoring at 191 abstractions points (105 Surface Water and 86 Groundwater) over a 12 month period. This programme will support the DWSP Source Risk Assessment by identifying the presence of substances above thresholds that pose a risk to drinking water.

Year	Planned Progress	Number Completed
2016	Source Risk Assessments completed as part of full DWSPs already carried out for major capital projects.	55
2018	Source Risk Assessments to be completed as part of a review of existing source protection plans and zones of contribution developed previously by the EPA, LA and GSI.	148
2018	Source Risk Assessments to be completed as part of preparation of a National Water Resource Plan.	100
2021	10 Source Risk Assessments per annum to be completed from 2017-2021.	50
Total		353

Table 8.1: Irish Water Programme for Preparation of DWSP Source Risk Assessments

8.1.2 Group water schemes

There are approximately 376 privately sourced Group Water Schemes (GWS) in Ireland that come under the remit of the Drinking Water Regulations. These community-owned and managed schemes supply 70,000 households representing 4.2% of the population using a variety of source types (52.5% groundwater and 47.5% surface water).

The National Federation of Group Water Schemes (NFGWS) which represents a large proportion of GWS has, since its establishment, advocated the "source to tap" approach to drinking water services provision and has developed a HACCP (Hazard Analysis and Critical Control Points) based Quality Assurance System which is in use throughout the sector.

The NFGWS developed a comprehensive strategy for source protection on group water schemes as an aid to group water schemes wishing to put in place their own scheme specific source protection plan. This strategy was published in November 2012.

A five year programme of work was initiated in 2013 to assist with the identification, mapping and risk assessment of the source zones of contribution (ZOCs) and catchment areas as a first step in the development of a scheme-specific source protection plan for each GWS. Grant aid of 85%, up to a maximum of €550 per GWS has been made available through the Rural Water Programme which is funded by the DHPCLG and administered and managed by the relevant Local Authority.

A total of 299 GWSs were identified (157 borehole, 75 spring, 56 surface water & 11 combination) as needing source

protection plans. The protection plans involve delineating the Zone of Contribution (ZOC) for each scheme, followed by the identification of catchment characteristics and potential sources of contamination, the monitoring of the water source, risk assessment and the development and implementation of remediation measures. By the end of 2016, assessments and reports for a total of 208 GWS are expected to be completed.

During the period 2017 to 2021, the following works will be undertaken for the remaining GWSs:

- Completion of Source Protection Zones of Contribution (ZOCs) and reports by the end 2018.
- Establishment of a raw water source monitoring programme.
- The preparation of a detailed source protection works plan for each GWS which will identify cost-effective solutions where infrastructural improvements have been recommended.
- Carry out the works identified in the above plans under the Rural Water Programme.
- Continue and expand the community engagement initiatives.

8.2 Achieving the requirements Bathing Water Protected Areas

For the 6 bathing water areas rated as poor in the 2015 Bathing Water Quality Report the latest status on the required improvement works is as follows:

- Irish Water has either carried out significant capital works to wastewater infrastructure, or has plans to do so in the near future, at Ballyloughane, (Co. Galway), Duncannon (Co. Wexford), Loughshinny (Co. Dublin), Rush South Beach (Fingal) and Youghal Front Strand (Co. Cork).
- Automatic warning signs have been installed and further investigative works are planned to identify the source of the problem at Merrion Strand (Dublin City) and develop mitigation measures.

8.3 Achieving the requirements for Shellfish waters:

To ensure compliance with the regulations, pollution reduction programmes have been put in place for each of the designated shellfish water.

As part of the licensing of discharges to waters the EPA requires Irish Water to provide an assessment of the impact on the quality of shellfish waters. Disinfection of discharges in the vicinity of shellfish waters may be required in certain situations to protect from any adverse effects of these discharges. To-date 38 impact assessment reports have been completed and the remainder will be completed by 2021.

8.4 Achieving the requirements for Nutrient Sensitive Areas:

Of the existing 42 designated nutrient sensitive areas 26 of the associated agglomerations have the required nutrient removal in place and comply with the standards. The remaining 16 agglomerations are scheduled by Irish Water for upgrade by 2021. Following the recent review of nutrient sensitive areas completed by the EPA at the request of the Minister for Housing, Planning, Community and Local Government, the Minister will consider formal designation of additional nutrient sensitive areas. The relevant authorisations will be reviewed and amended where appropriate by EPA.

8.4.1 Approach taken to achieving water conditions to support Natura 2000 site objectives

In relation to protected water-dependent habitats and species under the Birds and Habitats Directive the role of the river basin management planning process is to contribute towards achieving water conditions that support Favourable Conservation Status. In preparing this draft RBMP the risk assessment carried out by the EPA for these water dependent Natura 2000 protected areas has focussed on looking at the risks to the water standards/objectives established for the purpose of supporting Good Ecological Status (GES). GES, which is the default objective of the WFD, is considered adequate for supporting many water dependent Natura 2000 protected areas. The Freshwater Pearl Mussel is the exception where more stringent water condition standards have been established in law. However, it is recognised that this may need to be reviewed in certain cases where new evidence becomes available.

By definition, the habitats and species listed on the Birds and Habitats Directives are the most threatened and vulnerable across Europe. Some of the listed water dependent habitat types and species are particularly sensitive to environmental pressures and water standards/objectives may not be sufficient to support favourable conservation status in all cases. In other cases additional water related parameters may be important to supporting favourable conservation status. Ecological Quality Objectives have been developed and established in legislation for Freshwater Pearl Mussel populations in Special Areas of Conservation designated for their protection, including additional quality elements and standards (see proposed actions below). For SPA's specific protected areas objectives have not been determined at this stage and a default objective of achieving good status has therefore been applied.

Priority is being given to addressing those protected areas that are considered to be not meeting the required water conditions. These will be prioritised for further investigation and follow up action, as necessary. Follow up action may include the implementation of supporting measures and/or undertaking additional monitoring or research. Two priority protected habitats have been identified by the DAHRRGA and EPA where water quality standards for

GES may not be sufficient to protect these sensitive ecosystems. These are marl lakes and oligotrophic lakes. During this second cycle DAHRRGA and EPA will prioritise these two habitats for investigation and will develop appropriate environmental supporting conditions where required. These will be used as a basis for informing future management measures, where necessary.

8.4.2 Planned actions in relation to designated Freshwater Pearl Mussel areas

In the case of designated Freshwater Pearl Mussel areas, supporting water quality conditions equivalent to High Ecological Status have been established. DAHRRGA produced a national conservation strategy for the species in 2011, which prioritised implementation of measures at a catchment-scale for 8 freshwater pearl mussel populations. 80% of the total national population is present in these 8 catchments. All freshwater pearl mussel populations are in unfavourable conservation condition, as a result of hydromorphology, sedimentation and enrichment impacts.

Protected areas have been prioritised for supporting measures, where necessary, during this second cycle, and this will include designated Freshwater Pearl Mussel Areas. In addition, under the national conservation strategy for the Freshwater Pearl Mussel, the DAFM in collaboration with DAHRRGA is in the process of establishing a Locally Led Agri-Environment Scheme (LLAES) funded through the Rural Development Programme for the above mentioned eight designated Freshwater Pearl Mussel areas for priority action. This is to be a bottom-up partnership approach and will build on the experiences of the KerryLIFE project focused on the Caragh and Kerry Blackwater catchments. The scheme will target up to 800 participants and it is hoped that it will be open to participants in 2017.

In line with the national conservation strategy, DAFM (Forest Service) will implement a Plan for Forestry & Freshwater Pearl Mussel in Ireland, incorporating Catchment Forest Management Plans for the 8 priority catchments and the revision of the 'Forestry & FPM Requirements'. Practical forestry measures will include 'Continuous Cover Forestry', 'Reforestation for Biodiversity' and 'Forest Removal'. The Native Woodland Establishment Scheme, Native Woodland Conservation Scheme and actions to ensure afforestation of suitable sites, under the Forestry Programme 2014-2020, will be key to the implementation of forestry measures in the 8 priority catchments.

DAHRRGA will review and revise, as necessary, the national conservation strategy during this second cycle, incorporating the findings of the above initiatives, as well as the results of monitoring and research programmes. Site-specific conservation objectives for Freshwater Pearl Mussel SACs have already been published for a number of SACs and DAHRRGA will publish conservation objectives for all Freshwater Pearl Mussel SACs by the end of 2018. DAHRRGA will also continue to monitor and report on the condition of Freshwater Pearl Mussel populations and their habitat and will undertake prioritised practical conservation measures. Measures may include actions within the national

peatland strategy, assisted breeding, guidance on the assessment of the ecological impacts of proposed projects, and further population genetic studies.

8.4.3 Protected areas - principal actions for the 2nd cycle

The following are the planned principal actions for protected areas during the second cycle:

1. As part of the development of drinking water safety plans, Irish Water will complete 353 Source Risk Assessments by 2021.
2. Irish Water will also undertake a programme of raw water monitoring at 191 abstractions points to support the above risk assessments.
3. The National Federation of Group Water Schemes will continue its programme of source protection plans, with plans prepared for all relevant schemes.
4. The development of source risk assessments will contribute towards the identification of appropriate mitigation measures. An integrated and co-operative approach with all stakeholders will be required for the assessment, identification and delivery of necessary measures and the ongoing protection of drinking water sources, which will be facilitated through the implementation structures for this RBMP.
5. Works will be progressed to ensure 6 bathing water areas classified as poor in 2015 meet required standards.
6. At risk water dependant Natura 2000 sites will be prioritised for supporting measures.
7. DAHRRGA and EPA will undertake research to develop the required water related standards to support the conservation objectives for marl and oligotrophic lakes which have been identified as potentially requiring more stringent water quality conditions.
8. The DAHRRGA, with support from other agencies, will implement its strategy for designated freshwater pearl mussel areas.
9. The DAFM in collaboration with DAHRRGA will establish Locally Led Agri-Environment Schemes (LLAES) funded through the RDP for the eight priority designated Freshwater Pearl Mussel areas. The KerryLife project will be completed and provide important lessons for protecting other freshwater pearl mussel catchments.
10. Forestry Services will implement the Plan for Forestry & Freshwater Pearl Mussel in Ireland, which includes catchment forestry management plans for the 8 priority FWPM catchments.
11. DAHRRGA will review and revise, as necessary, the national freshwater pearl mussel conservation strategy to incorporate the findings of the above initiatives, as well as the results of monitoring and research programmes

8.5 Strategy and Actions to protect our High Status Waters

The protection of high status waters is one of the main priorities of this River Basin Management Plan. High status waters very often serve as tributaries and headwaters for larger water bodies. This River Basin Management Plan places a particular emphasis on the protection of high status waters as one of its top priorities and where possible, looks to provide the framework for restoration of some water bodies to high status, where deterioration has occurred since the beginning of the first river basin management planning cycle.

The challenge is to consider returning those that have declined to below high status since the beginning of the first planning cycle, protect those that are at risk of declining, and monitor environmental pressures that may cause other high status water bodies to deteriorate. Monitoring has shown that some water bodies are close to the high/good boundary and vary regularly between high, good and occasionally moderate status. It is therefore imperative to keep track of real improvements or declines in these water bodies, and to manage them appropriately as high status objective water bodies.

8.5.1 Measures already initiated

Because high status water bodies are sensitive to even minor increases in environmental pressures, a multipronged targeted approach is needed involving a range of stakeholders, including state agencies and local communities. Already a number of sectoral responses to the decline in high status water bodies have been initiated including the following:

Agriculture

The new Agri-environmental scheme (GLAS) administered by the DAFM, has a key objective of protecting waters and has been recently modified to contribute in particular to the protection of high status water bodies. The scheme provides priority access to farmers whose land holding is bounded by a high status water body. Participation in GLAS is then conditional on the farmer undertaking water protection measures including, as appropriate, fencing to prevent cattle access or establishment of riparian margins. To date, under Tranche I of GLAS, 9,919 farmers have taken up these measures and 8,005 km of fencing/riparian margins have been installed along high status water bodies. The water protection measure has the second highest uptake of all GLAS measures. (Further details on GLAS are given in Section 6.1 on agricultural measures).

In relation to the continuing pressure from agriculture, DAFM has funded a research project called HARMONY³⁴ led by Teagasc to investigate the impact of agriculture in high status catchments with the aim of integrating agri-environmental research with socio-economic tools to provide evidence-based measures for

nutrient management for these sensitive catchments. Agriculture in these areas is typically extensive and inadequate management of nutrient on farms can cause a significant pressure in sensitive catchments. The research identified a low uptake of soil testing and nutrient management planning within each catchment, leading to inefficient fertiliser use and poor redistribution of nutrients across the farm. There was also a lack of targeted nutrient management on peat soils under grassland which is important for P fertilisation as peat soils do not require P build up and thus should only receive maintenance P fertilisation. The inefficient use of fertilisers leads to a significant risk to water quality and the findings of the research so far point towards the need for targeted agri-environmental advisory support for farmers in these areas to achieve great P fertiliser use efficiencies and reduce risks of losses to waters.

Forestry

Recent forestry policies have been clearly aligned with water protection policy, namely the Water Framework Directive. This includes changes in relation to replanting policy and the establishment of a number of grant aided programmes which have been specifically designed with water protection in mind. These include (1) the Native Woodland Establishment Programme and (2) the Native Woodland Conservation Programme. The mandatory guidelines for “Environmental requirements for afforestation” are currently being revised by DAFM and include provision for water management plans for new afforestation plans. In addition, the Forest Service of DAFM has recently published a policy document “Woodlands for Water” which promotes the use of native woodlands as protection measures for waters. Consideration is being given to how the measures can be targeted and promoted in priority catchments such as in high status rivers and lakes. (Further details are given in Section 6.3 on forestry measures).

Domestic Waste Water Treatment Systems

The National Inspection Plan for domestic waste water treatment systems, prepared by the EPA, includes high status catchments as a priority for carrying out inspections of septic tanks. The Plan will be revised in 2017 at which time the most recent water quality results and the WFD characterisation process will further determine the relative risk posed by domestic waste water treatment systems and allow for a more targeted approach to inspections in high status water bodies at risk from DWWTs.

A national targeted engagement campaign is also being progressed by the EPA in co-operation with the local authorities and other stakeholder groups to address the issues identified during the engagement and inspection processes.

8.5.2 Further measures proposed for second cycle

In addition and in response to risks identified by the EPA and recommendations from a review of high status waters³⁵ it is proposed to undertake the following actions during this RBMP cycle:

³⁴ <https://www.teagasc.ie/environment/water-quality/harmony/>

³⁵ Ní Chatháin, B., Moorkens, E. and Irvine, K., Management Strategies for the Protection of High Status Water Bodies., 2012

Establish a “Blue Dot Catchments Programme”: A network of river and lake catchments where the objective is to protect and restore high ecological status, termed the “Blue Dot Catchments Programme”, will be established. The purpose of the Blue Dot programme is to provide a means of focussing attention and resources across a range of agencies with the aim of protecting, and where required, restoring high ecological status. The Blue Dot programme will seek to emulate the successful approach adopted by the EPA towards seriously polluted waters, whereby priority was given to eliminating pollution in these waters. This ‘red dot’ programme has seen the reduction of seriously polluted river channel length from 122km in 1997 to just 6km in 2015.

Establish a working group to develop and manage the Blue Dot Catchments Programme: In order to coordinate and focus efforts and resources across a number of key agencies for the purpose of protecting and restoring high status in the Blue Dot Programme it is proposed to establish a Blue Dot Working Group. This working group will be established at a national level and will be led by local authority regional structures. It will also include key stakeholders involved in delivering sectoral measures within these priority Blue Dot catchments. The EPA will provide technical support and advice. Key tasks for the Blue Dot working group include devising a strategic approach to taking effective actions in Blue dot catchments, including;

- Identify risks to water quality in the Blue Dot catchments through local investigation which may include targeted environmental monitoring and assessments,
- Broad education/awareness raising initiatives in Blue Dot catchments to promote best environmental practice, for example, in land management and maintenance of septic tanks),
- Improving the exchange of information within and across agencies to monitor activities on an ongoing basis in Blue Dot catchments (e.g. land use change, new developments) which may result in deterioration in the future and take early corrective action to eliminate risks to water quality,
- Promoting and supporting the establishment of community led catchment initiatives in Blue Dot catchments,
- Providing targeted agri-environmental advisory support to farmers in Blue Dot catchments to assist in identifying risks to water at farm level and developing tailored solutions,
- Identifying and promoting the uptake of relevant grant schemes, where appropriate, in the Blue Dot catchments for the purpose of improving the protection of water quality. E.g. GLAS, the Locally-led targeted Agri-Environment Schemes, the forestry native woodland schemes and the LEADER programme (Protection and sustainable use of water resources),
- Identify research needs with the aim of developing solutions to the environmental pressures facing high status waters, and measuring the effectiveness of existing solutions. This role should also include the promotion of high status waters as a priority theme in the development of research policies by key stakeholders.

8.5.3 High status rivers and lakes - principal actions for the 2nd cycle:

The following sets out the principal planned actions related to high status rivers and lakes;

1. Existing measures, such as the GLAS scheme, forestry schemes and septic tank inspections will continue to promote the protection of high status waters. Uptake of these schemes in high status areas will continue to be promoted and a proportion of septic tank inspections will be weighted towards high status catchments.
2. Recognising that protecting high status waters is a priority, a “Blue Dot Catchments Programme” will be developed and implemented. This will establish a network of river and lake catchments with the shared objective of protecting and restoring high ecological status waters. This programme will be delivered through local authority structures, integrating with wider implementation structures, and will facilitate focussed deployment of resources to “Blue Dot” catchments.
3. In addition to facilitating focussed deployment of resources, the Blue Dot programme will facilitate public awareness and engagement including the development of community led catchment initiatives through LAWCO.

Section 9:

Economic analysis of water use

This section provides a brief economic analysis of water use in the Irish river basin district. It provides some socio-economic information before outlining information on the estimated water use within sectors, the costs associated with the provision of water and waste water services and cost recovery within the sector. Planned actions in the area during the second cycle are also set out.

9.1 Introduction

Article 9 of the WFD requires Member States to take account of the principle of recovery of the costs of water services, including environmental and resource costs, in accordance with the polluters pay principle. Cost recovery must have regard to an economic analysis of the costs associated with the provision of water services, including long-term forecasts, undertaken for the purpose of Article 5. Article 9 also sets out the need to ensure adequate incentives for users to use water resources efficiently, and for an adequate contribution of the different water users (industry, households and agriculture) to the recovery of costs. In doing so, Member States may have regard to the social, environmental and economic effects of the recovery of costs, as well as the geographic and climatic conditions of the region. Furthermore, Article 9 allows Member States, where it is established practice, to not apply the provisions of cost recovery, where this does not compromise the purposes and achievements of the objectives of the directive.

The availability of data and research around water use in Ireland has improved over the period of the first cycle. This is mostly associated with the water reform programme including the setting up of a single national utility for water and waste water services and the independent regulation of the sector. It is recognised that there is a need to further improve the data and information associated with the sector, and the associated economic analysis of this data, and this work will continue to develop over the period of the second cycle.

9.2 Significant water pressures and socio-economic context

Section 4 of the draft RBMP identifies the significant water pressures causing water bodies to be at risk of not meeting the objectives of the WFD. These pressures include; agriculture, urban waste water, hydromorphology, forestry, extractive industry, domestic waste water, urban run-off and industry.

With regard to agriculture, as noted in the opening section of this plan, the agriculture and food sectors make vital contributions to economic activity and output in Ireland. Over 160,000 jobs are directly associated with the sector and the value of exports is in the region of €10bn per annum. Food Wise 2025 sets out a strategy aimed at increasing the value of exports to €19bn per annum by 2025. Much of this increase in the value of output is to be

achieved through efficiencies such as technological improvements, knowledge transfer, driving innovation, developing new products and opening up new markets. However, it is also expected that the strategy will result in structural changes within the sector, such as a greater emphasis on dairy production. The potential impact of such changes on water quality, and indeed the wider environment, is recognised within the Food Wise 2025 Strategy. Sustainability is a key goal of the Irish agri-food offering and therefore monitoring and mitigation of any impacts as they emerge will be an important aspect of Food Wise 2025 and indeed implementation of this RBMP.

The forestry sector is also important, both economically and socially. The annual output of the industry is valued at around €2.3 billion, and our forests also provide recreational and tourist facilities. Sustainable expansion of forestry in Ireland is a key component of our climate mitigation strategy. Again, the potential for growth in this sector to impact on water quality is recognised, and the responses to these pressures are covered in section 7 of this plan. With regard to extractive industry, peat extraction is the predominant source of pressure on water quality. In this regard it is noteworthy that CSO data shows that nationally 7% of households use peat as their primary source of heating – with 34% of households in the Midlands region and 24% of households in the Western region using peat as their primary source of heating.³⁶ This shows the importance of that fuel source, in particular in a rural context.

With regard to both urban waste water and domestic waste water pressures, it is important to consider these in the context of the settlement patterns noted in Section 1 of this draft RBMP – with 38% of the population living in rural areas. In line with these settlement patterns Census data shows that 69% of households are connected to public waste water systems, with the remainder having other systems such as septic tanks. Furthermore, a significant share of the population (18% in total) are not connected to the public water supply, and instead have individual wells or are connected to group water schemes. Population growth is recognised as a potential pressure with regard to waste water services, and indeed the supply of drinking water. The strategic plans, and specific projects, developed by Irish Water take account of projected population growth and also the need to ensure sufficient headroom to deal with future population and economic growth.

In addition to the links between pressures on water and the socio-economic characteristics of the river basin, the wider water environment in Ireland supports both economic and social activities. Whilst the full economic value of water and the wider water environmental requires further works, an economic study of recreational angling in Ireland has estimated that it contributes €755m per annum to the Irish economy – indicating the important contribution the water environment makes to our economy and society.³⁷

9.3 Cost and costs recovery for water services

9.3.1 Structure of Water and Waste Water Services in Ireland

A detailed analysis of the structure of water and waste water services in Ireland was carried out by PWC as an input to the reform of water services.³⁶ Based on the available information at that time this analysis found that 77% of households are connected to the public water supply (now provided by Irish Water), a further 12% are connected to either public or private group schemes and the remaining 10% have private supplies (i.e. are connected to wells).

For those households with private wells, the economic cost of drinking water supply is fully borne by the user. The group water schemes are generally co-operative groups delivering drinking water services to local communities in rural locations, where the high cost of providing infrastructure has made the provision of a public supply unviable. Public group water schemes are supplied in bulk by Irish Water, whereas private group water schemes have their own supply source. To recover costs from public group water schemes Irish Water has adopted the charging practices previously used by Local Authorities. Public group water schemes generally supply both domestic and non-domestic users and they are typically charged for the metered amount less a domestic water allowance for each domestic user in the scheme. The approach to costs recovery has been to ensure equitable treatment between domestic users who are direct customers of Irish Water and domestic users on public group schemes.

With regard to domestic waste water services, Census data suggests that 69% of households are connected to public waste water services, provided by Irish Water. The remaining 31% have individual or group appropriate treatment systems – a figure very much in line with the scale of rural population. For those not connected to the public waste water services, the costs of provision and maintenance of the appropriate systems are borne by the user.

9.3.2 Estimates of water use in Ireland

Domestic metering has provided accurate data on usage per property. A full calendar year of more than 500,000 meter reads in 2015 finds average per property consumption of 365 litres per day. This would include private side leakage where this is occurring. Irish Water estimate that they supply 82% of households with drinking water – the vast majority through direct supply with some indirect supply through public group schemes. Based the above per property consumption rate, and the share of households supplied through the public water supply, Irish Water estimate a total consumption of around 214 million m³ for relevant households.

Assuming this average of 365 litres per property per day also applies to households in private group water schemes and to those households with individual wells their combined total water use would be around 47 million m³ per annum. This yields an estimate of 261 million m³ per annum of total drinking water use for domestic households in Ireland.

With regard to non-domestic water use, there are approximately 189,000 non-domestic connections to the public water and/or waste water supply, with 96% of these connections metered.³⁹ Irish Water is improving the collection of non-domestic data through migration of billing from local authorities to Irish Water. The accuracy of non-domestic data will be improved through two programmes targeting smaller non-domestic meter systems refurbishment and large non-domestic revenue meters, which will inform the development of the non-domestic tariff proposals. Current estimated total consumption for these non-domestic customers fluctuates in the range 330 to 350 million litres per day, comprising metered and unmetered non domestic usage. This equates to total non-domestic water use in the range 120 - 128 million m³ per annum.

Network losses in the public supply are estimated from the difference between water abstracted and treated, and the above levels of consumed water for those supplied by the public supply. The table below provides estimated use for domestic and non-domestic public water users, network losses from public supply, and estimated domestic use from private group schemes and private wells.

Sector	Estimated annual water use (million m ³)
Domestic public supply consumption	214
Non-domestic public supply consumption	124
Network leakage/unaccounted for public water	266
Operational use for mains flushing and networks maintenance	1
Estimated private wells and private group schemes - domestic use	47
Total	652

Table 9.1 Estimated annual drinking water use (million m³) by sector

Estimates for water use by the agriculture sector in Ireland are provided in the table below. The activity levels are from the most recent CSO data. The estimated water use for dairy cows, beef herd and sheep are based on published research data for Ireland. For all other cattle, pigs, poultry and crops the water use estimates are taken from work carried out by Scottish Authorities for their

³⁶ CSO QNHS Module on Household Environmental Behaviours 2014 (<http://www.cso.ie/en/releasesandpublications/er/q-env/qnhsenvironmentmoduleq22014/>).

³⁷ Socio-economic study of recreational angling in Ireland 2013 (<http://www.fisheriesireland.ie/AnglingStudy2013>)

³⁸ Reform of the water sector in Ireland – Position Paper January 2012 <http://www.housing.gov.ie/sites/default/files/migrated-files/en/Publications/Environment/Water/FileDownload%2C29192%2Cen.pdf>

³⁹ This information is based on 2013 billing data.

economic analysis of water use as part of their RBMP. On this basis total water use for agriculture in Ireland is estimated at around 153 million m³ per annum.

	Activity level (Head - 2016)	Estimated water use per unit of activity (m ³ /annum)	Implied estimated annual water use by activity (Mm ³ /annum)
Dairy cows	1,397,900	33.4	46.7
Beef herd - suckler cows	1,103,700	19	21.0
All other cattle	4,719,600	11	51.9
Sheep	5,175,800	2.9	15.0
Pigs	1,594,000	10.6	16.9
Poultry	11,000,000	0.094	1.0
Crops (ha)	286,000	2.1	0.6
Total			153.1

Table 9.2: Estimate of water use within the agriculture sector by sub-sector

9.3.3 Cost of public water and waste water provision

Prior to the establishment of Irish Water as a single national utility for the provision of public water and waste water services, these services were delivered by 34 Local Authorities acting as water authorities. Central Government funding was provided for capital investment programmes in water and waste water infrastructure through the Water Services Investment Programme (WSIP). This funding was supplemented by individual Local Authorities from within their own resources, including non-mortgaged loans and income from development levies.⁴⁰ The historical level of funding for the Water Services Investment Programme is set out in the chart below.

Water Services Investment Programme for 2000-2013.

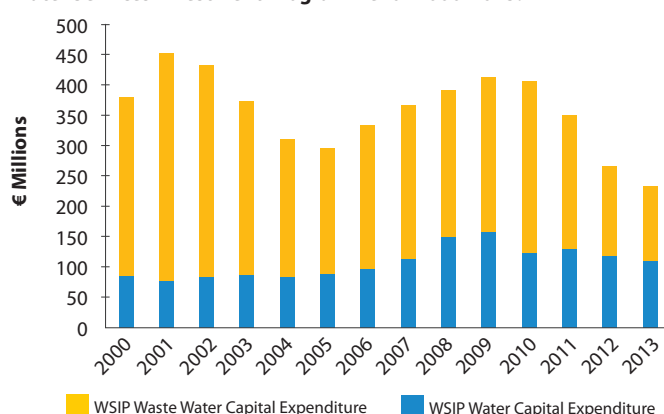


Figure 9.1: Capital expenditure on the Water Services Investment Programme for 2000-2013.

The total capital allocation from the WSIP over the period 2000-2013 is estimated at €5bn, with €1.5bn expenditure on water and €3.5bn on waste water. For 2009-2013, which reflects

the period of the first cycle RBMP when water services were delivered by individual local authorities, the WSIP provided a total of €1.67bn in capital funding – with €633m allocated to expenditure on water projects and €1.03bn allocated to waste water expenditure.

However, it should be noted that the actual capital expenditure by Local Authorities was greater than the amount allocated through the Water Services Investment Programme. For example, the non-domestic element of WSIP projects were met by Local Authorities, and these were generally in the region of 20%-25% of total costs depending on the ratio of domestic to non-domestic demand driving the need for investment. For some elements of the WSIP the Local Authority contribution was greater – for example for the Serviced Land Initiative (SLI) which was a sub-programme of the WSIP, Local Authorities were required to meet 60% of costs.⁴¹

With regard to the operational costs of running public water and waste water services Local Authority operational costs for the provision of these services in 2013 is estimated at €721m. Income from non-domestic water charges was €185m for 2013. The funding gap was met by other income sources, mainly the General Purpose Grant, which is paid from central government to local authorities to provide finance for the funding of some day-to-day activities and local government initiatives, and also from own resources.⁴³

The above information relates to the period prior to the establishment of Irish Water. Since 2014 both capital and operational expenditure on public water and waste water services are incurred by Irish Water. This will result in a more coherent understanding of expenditure in the future. However, some complexity arises around issues such as surface water drainage which remains the responsibility of Local Authorities.⁴⁴

The processes around funding for Irish Water are still evolving, however, in summary the Commission for Energy Regulation (CER) sets an allowed level of revenue for Irish Water for each year. This is currently set on two year cycles termed 'revenue review periods'; for example the current revenue review period is for the period 2017-2018. Here, the CER reviews Irish Water's proposed capital and operational expenditure and determines the revenue that Irish Water is allowed to recover for the period. This allowed revenue provides Irish Water with allowances to cover costs relating to operational and capital expenditure and also incorporates efficiency challenges as imposed by the CER.

With regard to capital expenditure specifically, the chart below sets out estimated capital expenditure on water and waste water by Irish Water.⁴⁵ For the period 2014-16 figures (nominal prices) are based on actual expenditure to 31 October 2015 and estimated forecast expenditure to 31 December 2016. The expenditure for 2017-21, expressed in 2015 prices, represents Irish Water's proposed capital investment over the period as set out in their

⁴⁰ Irish Water Phase 1 Report, PWC, 2011 <http://www.housing.gov.ie/sites/default/files/migrated-files/en/Publications/Environment/Water/FileDownload%2C29193%2Cen.pdf>

⁴¹ Water Services Investment Programme 2007-09 Value for Money Review (2010) <http://www.housing.gov.ie/sites/default/files/migrated-files/en/Publications/Environment/Water/FileDownload%2C27138%2Cen.pdf>

⁴² Reform of the water sector in Ireland Position Paper January 2012 Department of Environment, Community and Local Government.

⁴³ Irish Water Phase 1 Report, PWC, 2011 <http://www.housing.gov.ie/sites/default/files/migrated-files/en/Publications/Environment/Water/FileDownload%2C29193%2Cen.pdf>

⁴⁴ Further consideration is also required for the final plan around historic and projected expenditure in the area of group/rural water services.

⁴⁵ In the chart costs related to the metering programme, establishment costs and non-network capital investment have been split equally between water capital expenditure and wastewater capital expenditure.

capital investment plan. This amounts to a total of €3.7bn over the period. However, no non-network capital investment is included for the period 2019-2021 as this has yet to be estimated.

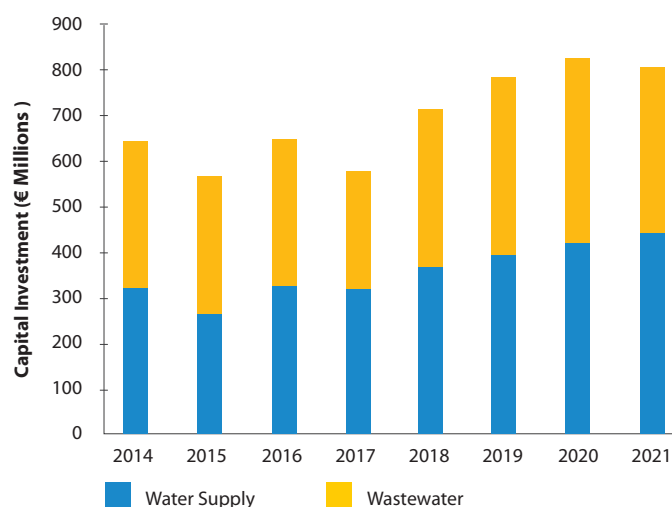


Figure 9.2: Estimated capital expenditure (2014-2016) on public drinking water and waste water, and future capital expenditure (2017-2021) as proposed by Irish Water in their Capital Investment Plan (2017-2021)

Whilst the above sets out Irish Water's proposed investments as outlined in the Capital Investment Plan the CER reviews and approves Irish Water's proposed investment figures periodically as part of its revenue control process. In December 2016 the CER issued its decision regarding Irish Water's allowed revenue for the period 2017-2018.⁴⁶ This decision provides for allowed revenue to cover Irish Water's capital expenditure for that period. The CER has allowed Irish Water capital costs of €523m for 2017 and €629m for 2018 (in 2015 prices). Here, Irish Water is required to reduce its proposed expenditure by 10.6% for that period. In terms of understanding the total costs associated with the provision of water and waste water services, the information provided here shows that, based on their regulatory decisions, CER expect total operational and capital expenditure by Irish Water for 2016 to be in the region of €1.3bn – of which €722m was allowed for operational and €637m for capital expenditure.⁴⁷

Operational costs for Irish Water cover the day-to-day running costs of the utility. The CER approves allowances for Irish Water's operational costs as part of a revenue control process. The first revenue control (IRC1) ran from 1 October 2014 to end 2016. During that period, the CER allowed Irish Water to recover operational costs of €734m and €722m, for 2015 and 2016 respectively together with €202m for Q4 2014. These allowances included a requirement for Irish Water to deliver efficiencies of 7% per annum within its controllable operational costs. The second revenue control (IRC2) will run over 2017 and 2018. On 12 December 2016, the CER decided to allow operational costs of €710m for 2017 and €685m for 2018. These figures mean that Irish Water will be required to deliver efficiencies of around 20% within its base controllable operating expenditure over the period from the start of 2015 to the end of 2018.

9.3.4 Cost recovery in the public water and waste water sector

The above information outlined past levels of expenditure on public water and waste water services, and planned future levels of expenditure. The following considers how the costs of public water and waste water services were recovered historically as well as detailing the present cost recovery model and developments in same.

Since 1998 Government's National Water Pricing Policy has been to charge non-domestic customers for water and waste water services the full costs of providing such services to these customers. Historically non-domestic charges were charged and collected by individual local authorities, which has resulted in 44 distinct billing authorities. Since 2014 Irish Water has been responsible for service provision to non-domestic customers. For the most recent regulatory period (October 2014 – December 2016) the CER expected that Irish Water would bill approximately €230m per annum to non-domestic customers. Direct billing of these customers by Irish Water will be fully in place in 2017. Furthermore, the CER has agreed a project plan for the establishment of the enduring Non-Domestic Tariff Framework with Irish Water. This project has already commenced and Irish Water is currently progressing the development of its tariff design and transitional proposals. The public consultation phase of the project will begin in 2017 and planned implementation of the new enduring tariff is mid-2018.

With regard to the costs of domestic public water and waste water services, over the period 1997 to 2014 the Exchequer met the capital, operational and maintenance costs for the provision of these services. Domestic water charges were introduced on 1st January 2015. For those households using both the public water supply and the public wastewater services, the metered rate of charges was set at €3.70/m³. For households using only one service (water supply or wastewater) the metered charge was set at 1.85/m³. Charges were capped at a maximum level which varied based on household composition. The capped rates were based on usage of around 43m³ per annum for single occupancy household and around 70m³ per annum for multi-adult households. Where metered usage was lower than the capped rate the bill would be less than that capped rate. Additionally, a water conservation grant of €100 was introduced in 2015, which all households were eligible for. However, those households supplied by Irish Water had to register as customers by June 2015 to be eligible.

Based on the above level of charging, and excluding the net impact of the water conservation grant, it was envisaged that in total domestic customers would be charged in the region of €270m per annum. Together with non-domestic charging, which was expected to total around €230m per annum, this would have resulted in total combined charges to customers in the region of €500m per annum.

⁴⁶ Irish Water Second Revenue Control 2017-2018, Decision Paper, CER/16/342, 12 December 2016, [http://www.cer.ie/docs/001108/CER16342%20CER%20Decision%20on%20Irish%20Water%20Revenue%20for%202017-2018%20\(4\).pdf](http://www.cer.ie/docs/001108/CER16342%20CER%20Decision%20on%20Irish%20Water%20Revenue%20for%202017-2018%20(4).pdf)

⁴⁷ Under the CER regulatory model, capital expenditure is funded through a depreciation charge and rate of return allowance within the overall revenue allowance. Furthermore, these are forecast numbers and subject to outturn. For Irish Water financial accounts aspects of operational and capital costs are treated in a different manner to regulatory accounting as the former are produced in line with International Financial Reporting Standards.

The current situation with regard to domestic water charges is that in June 2016 the Oireachtas voted to suspend charges for a period of 9 months, from 1st July 2016 until 31st March 2017. This suspension has meant the latest bills which have issued to domestic customers relate to Quarter 1 2016 consumption. This is to allow a deliberative process on the future funding of public domestic water and waste water services to take place. This process will consist of three stages, namely:

- An expert commission on domestic public water services was established to report on the funding of domestic public water services in Ireland and provide recommendations on a sustainable long-term funding model for domestic water and wastewater services. This expert commission reported in November 2016.⁴⁸
- A special Oireachtas committee which will then examine these recommendations and endeavour to make its own recommendation. It is expected that this process should take about three months.
- Finally, the Oireachtas will, within one month of the committee's recommendations, consider and vote on those recommendations.

The Government is also committed to establishing, on a statutory basis, an external advisory body to advise on measures which may be needed to improve the transparency and accountability of Irish Water. It will publish advice to the Government and give quarterly reports to an Oireachtas Committee on the performance by Irish Water on implementation of its business plan. The work of this external advisory body will complement the work of the CER in its role as economic regulator of water and waste water services.

9.4 Promoting efficient and sustainable water use

9.4.1 Drinking water efficiencies

The first phase of the domestic metering programme, which commenced in 2013, had the objective of installing 1.05 million meters. It is expected that by February 2017 around 880,000 meter installations in domestic dwellings will be completed. Future metering of domestic dwellings will be prioritised along with other investment needs, based on cost benefit assessments, policy considerations and technical difficulties with regard to some dwellings. Decisions on such future investments will be made under the normal regulatory regime and processes whereby the CER approves the capital revenues associated with Irish Water's Water Services Capital Investment Programmes.

The meters now in place provide data which is useful for a number of purposes; providing online information to metered customers with regard to their water usage, and providing Irish Water with accurate data to improve forward planning and investment decisions with regard to water supply and network leakage.

As is clear from the figures above, very significant amounts of treated water are lost to leakage. A key deliverable set out in Irish Water's Business Plan is the reduction of leakage from 49% in 2014 to 38% by the year 2021 and thereafter to Sustainable Economic Levels of Leakage (SELL). The metering programme was supplemented by a "first fix" leakage programme whereby Irish Water has repaired leaks from external supply pipes on the external customer property side, despite such leaks being the responsibility of customers. Irish Water estimates that by the end of Q2 2016 this, along with other interventions, has resulted in over 65 million litres of water per day saved – equating to around 23.7 million m³ per annum of water saved.

Irish Water plan to invest around €73 million per annum out to 2021 to reduce leakage. This contributes to Irish Water's overall leakage target of 226 million litres of water per day saved – equating to around 82.5 million m³ per annum of water saved in the period 2014 to 2021. A range of interventions are being implemented including pressure management activities, active leakage control measures, water-mains renewals and continued customer side savings.

9.5 Cost effectiveness of measures

The individual programmes and projects delivered as part of our basic measures are subject to the normal cost effectiveness analysis or cost benefit analysis prior to investment being made, in line with normal public spending procedures. Whilst measures are required and implemented across the sectors identified as causing significant pressures to at risk water bodies, urban waste water treatment is the most significant area of expenditure. As has been outlined the effectiveness and efficiency of expenditure in this area is ensured through the economic regulation of Irish Water by CER.

In terms of measures, and in particular supporting measures, it is acknowledged that assessing cost effectiveness was not strong enough as part of the implementation structures of the first cycle of plans. This is something which will be rectified in this cycle, and the implementation structures will ensure that measures will be monitored such that cost effectiveness analysis can take place to better inform future decision making with regard to measures.

⁴⁸ Report on the funding of domestic public water services in Ireland (November 2016) <http://www.oireachtas.ie/parliament/media/committees/futurefundingofdomesticwaterservices/Report-of-Expert-Commission-on-Domestic-Public-Water-Services.pdf>

9.6 Actions to improve economic analysis and sustainable use of water over the 2nd cycle

Whilst our understanding of overall water usage, and the sector more generally, has developed over the period of the first cycle, it is recognised that improved economic and socio-economic analysis is required in the water area, as is the continued progression of water conservation measures based on best available evidence. With this in mind, over the course of the second cycle the following actions will be undertaken:

1. CER, as economic regulator, will approve Irish Water costs and continue to drive efficiencies within its cost base. For example, Irish Water is required to deliver efficiencies of around 20% within its base controllable operating expenditure over the period from the start of 2015 to the end of 2018.
2. CER will also monitor Irish Water's delivery for money spent and publish information to improve transparency in this regard. For example, the CER is currently putting in place a suite of metrics against which it will assess Irish Water's performance, over time and against international comparators. These metrics will relate to, for example, customer service, environmental performance, quality of service for water supply, security of water supply and sewerage service.
3. CER will continue to develop and implement a harmonised suite of non-domestic water tariffs that will benefit customers in terms of transparency, equity and simplicity. Similar work will be progressed by the CER in relation to a harmonised suite of charges for connection to the water and wastewater systems.
4. Metering information will be used by both Irish Water and CER to improve our understanding of water use and leakage. Irish Water will continue its programme to address leakage and unaccounted for water, with an expected outcome of saving around 82.5 million m³ of water per annum by 2021.
5. Data from both non-domestic and domestic water meters will be used to develop basic annual water statistics to be produced and published by the CSO, in co-operation with other stakeholders. CSO will also develop catchment specific statistics to support delivery and monitoring of this RBMP – again in co-operation with other stakeholders.
6. The economic analysis of water will be developed on an ongoing basis throughout this second cycle, in particular following decisions around the future structures and funding model for the delivery.



Section 10: Implementation Strategy for the 2nd Cycle

This draft RBMP sets out a range of actions aimed at moving towards the objectives of the WFD. In terms of devising a strategy for implementation it must be acknowledged that the planned actions are diverse, involving multiple stakeholders and will be implemented taking account of available resources. Planned actions range from high level national measures implemented by national authorities (such as the Irish Water Capital Investment Plan and the Nitrates Action Programme), through to sub-catchment management and water body specific measures that need to be refined and implemented at a local level. In addition, measures such as the National Dairy Sustainability Forum represent a stakeholder-led approach to WFD implementation not previously developed during the first cycle. Furthermore, the vital role of monitoring implementation is also recognised, as is the need for further investigation and the refinement of measures where the exact cause of impact on water status is not fully understood. A specific challenge, therefore, is the efficient and effective allocation of available resources between implementing measures, further characterisation, and monitoring.

The learnings from the first cycle, set out in section 1 of this draft RBMP, point to more success in implementing basic measures, through national policy and programmes, than for water body specific measures. It is also apparent that the measures successfully implemented tended to be those driven by a single authority, for example, the Nitrates Action Programme and cross-compliance inspections. Furthermore, in assessing the first cycle of RBMP the European Commission observed that “there was no single body having ultimate responsibility” and also stated “fragmented institutional structures, poor intra and inter-institutional relationships and capacity” undermined the ability to both develop and implement plans.

Finally, as previously noted, the public consultation process for developing this draft RBMP has identified the need to improve approaches to, and structures for, communication and public and stakeholder engagement. The strategy and structures used to develop this plan, and those set out with regard to implementation of this second cycle RBMP aim to address these issues. Significant improvements in term of providing the public and other stakeholders with information have been made in the context of developing this draft plan, including the development of the catchments.ie website and publication of regular catchment newsletters. The proposed actions to improve this area are set out in section 11 of this draft RBMP.

10.1 High level implementation strategy

As noted in Section 5 of this draft RBMP, 41% of our water bodies meet, or are expected to meet, the requirements of the WFD. For these water bodies the full implementation of basic measures, along with continued monitoring, is expected to be sufficient. For those water bodies at risk of not meeting the requirements of the WFD, the potential for better targeting of basic measures will be examined and the implementation of appropriate supplementary measures may also be required. In terms of targeting measures, this process will be driven at regional level and will be based on the evidence from the catchment characterisation process, the objectives and priorities set out in this plan, and wider socio-economic and feasibility considerations, to arrive at an agreed prioritisation of actions for the period of this plan. This process is designed to be dynamic and adaptable to new information as it becomes available through further characterisation and assessment.

The proposed implementation structures have been cognisant of the following challenges:

- Actions range from national measures by national authorities right down to locally devised solutions for individual water bodies.
- Co-ordinated action is required by the many competent bodies and stakeholders.
- There is potential for better targeting of basic measures through such co-ordination.
- Actions need local, regional and national level co-ordination and management to ensure the appropriate measures are implemented in the right places to achieve the required outcome.
- It must be ensured that ownership of actions rests in the right place, and that those responsible for implementation of actions have the knowledge, expertise, authority and resources necessary to implement the actions.
- Voluntary approaches must be supported by effective enforcement where necessary.
- Further characterisation and investigative work will be necessary for those water bodies where the risk is not yet fully understood. Investigative assessments are required for such water bodies, but this need must be balanced with the requirement to implement measures where positive environmental outcomes are anticipated, such that the best use of resources is ensured.
- The actions delivered, the resources associated with those actions, and the resultant impacts on water quality must be monitored and reported on in an effective and efficient manner making the optimal use of technology.
- Plans, actions, and progress must be communicated effectively and in a timely and transparent manner – again at national, regional and local level.

10.2 Implementation structures

Based on the challenges outlined above, and building on the reformed structures used to develop this plan (outlined in Section 2), the working arrangements below will be used to implement this cycle of the RBMP. Whilst for the purposes of this plan the working arrangements are set out formally to ensure successful implementation, it is fully recognised that integrated and co-operative working relationships between

stakeholders will be the key to success. As such all bodies associated with the development of this plan will endeavour to adopt an ethos of actively participating and working together through, on a day to day basis and through the governance structures outlined, to develop and deliver integrated catchment management on the ground.

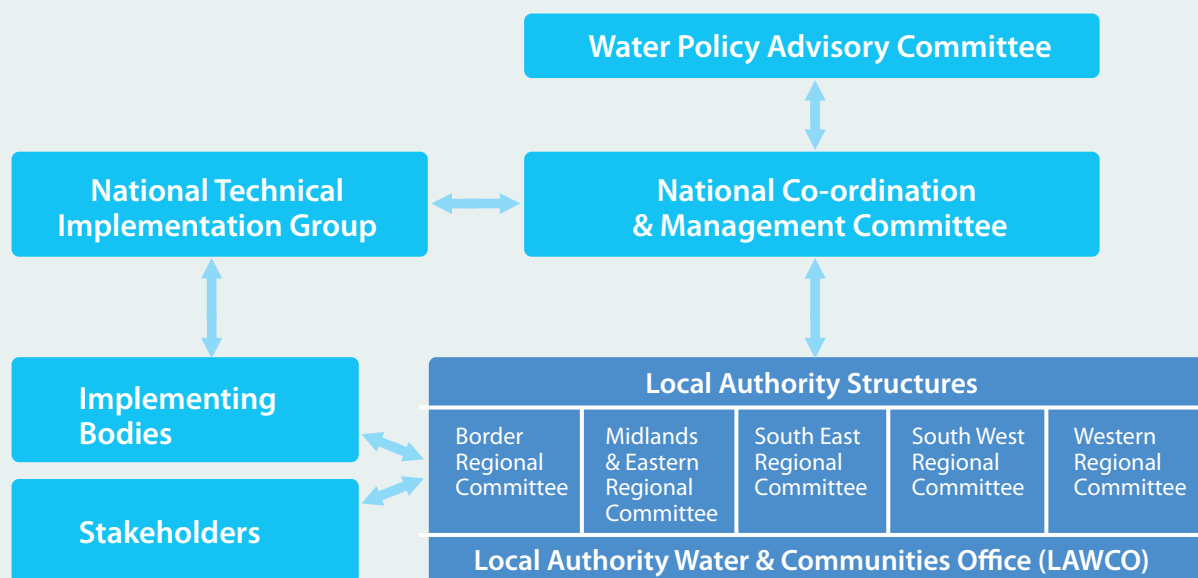


Figure 10.1: Proposed governance and co-ordination structures for implementation of the second cycle river basin management plan.

Water Policy Advisory Committee (WPAC): The existing WPAC, established as part of the structures for preparation and implementation of the WFD, will provide high level policy direction and monitoring of implementation over the period of this RBMP. WPAC will also advise the Minister with regard to progress of the plan. It will continue to be chaired by a representative of the Minister, currently an Assistant Secretary of D/HPCLG.

The National Co-ordination & Management Committee (NCMC): The WPAC is now establishing a National Co-ordination and Management Committee (NCMC) to ensure the POMs is actively managed over the period of implementation of the plan, and to embed the partnership approach taken in developing the draft RBMP. The NCMC will provide the necessary interface between science, policy, and programme delivery. It will agree and oversee the overall work programmes and report to WPAC on progress; It will address potential obstacles to implementation and it will advise WPAC on future policy needs as may be required. The NCMC will also be responsible for overseeing the preparation of future River Basin Management Plans and Programmes of Measures on behalf of WPAC. The NCMC will be chaired by the DHPCLG and will comprise representatives of the DHPCLG, EPA and chairs of the regional committees.

The National Technical Implementation Group (NTIG): The NTIG will oversee technical implementation of the River Basin Management Plan at a national level and provide a forum to ensure co-ordinated actions amongst all relevant State actors and address operational barriers to implementation that may arise. The group will be chaired by the EPA, and membership will include the local authorities, OPW, IFI, Teagasc, DAFM, Irish Water, DHPCLG, Forest Service, Coillte, NPWS and other implementing bodies, as appropriate. It will review progress on an on-going basis, provide updates to the NCMC on the implementation and effectiveness of measures. The NTIG will also be a forum for information exchange and to promote the consistency of regional implementation. The EPA, who is statutorily responsible for reporting on the WFD, will coordinate ongoing tracking of the implementation of actions and will, in conjunction with others, undertake assessment of their effectiveness via the monitoring programme. The Group will continue to have the machinery and resources of NIECE (Network for the Ireland's Environment Compliance and Enforcement) available to it through the Catchment Management Network established in 2014.

Regional Local Authority Structures: The Local Authority National RBMP Office, supported by 5 regional committees, will have responsibility for co-ordinated delivery of measures at regional and local level – and ensuring a consistency of approach across the regions. The 5 regional committees will be chaired at Chief Executive level, with active participation and technical advice from the EPA. They will each produce a Regional Integrated Catchment Management Programme for the period of this RBMP (2017-2021). These will set out the areas prioritised for action at water body, sub-catchment and/or catchment level as appropriate. This prioritisation will use the EPA catchment assessments as a starting point, with the prioritisation of areas and actions to be agreed with relevant stakeholders based on wider considerations of socio-economic impacts and feasibility. The programmes will also set out the measures to be implemented in each relevant area, the responsible bodies to action these measures, the resources assigned, and expected timelines for implementation. The programmes should also set out how communities and other stakeholders will be included and engaged with. The LA structures will also be central to tracking the progress and effectiveness of implemented measures – including through annual reporting of progress. The LA structures will also have a vital role in supporting national policy development and implementation through their

participation in WPAC and NCMC. Furthermore, the Local Authority Waters and Community Office, outlined in more detail in Section 10, will also have a very important role in these structures, not least in terms of ensuring public and stakeholder engagement with the implementation of measures at regional and local level.

It is envisaged that these implementation structures will build on the successful elements of the first cycle, whilst addressing shortcomings with regard to local and regional implementation, national oversight, public engagement and communication. The structures to improve public engagement and communication are outlined in the next section – and include the setting up of a National Water Forum, the outputs of which will inform the work at all levels of the implementation structure.

Whilst national authorities such as DAFM, Irish Water, IFI, NPWS and the EPA will continue to drive implementation of national measures, the regional structures will allow for better co-ordination and targeting by national authorities in their implementation. However, ultimately the decision making for such measures must rest with the competent national authorities as they must prioritise at national level, in the context of wider socio-economic and affordability concerns.

10.3 Indicative flowchart for implementation of local and regional measures

Implementation of national measures during the second cycle will continue to be driven by the competent national authorities, with input from the Local Authority Regional structures and the EPA with regard to potential improvements or better targeting of measures. For example, it may be the case that local or regional input could improve the application of national scale measures in specific instances. Furthermore, measures such as the National Dairy Sustainability Forum could also benefit from the potential for synergies with the work of the Local Authority Regional Structures.

Decisions around prioritisation at sub-catchment and/or water body level, and associated implementation of measures at a regional and local level, will be taken by the Local Authority structures. The starting point for this prioritisation will be the EPA characterisation work and the priorities set out in this draft RBMP. However, to ensure effective and efficient implementation the prioritised areas and actions will be

agreed with relevant stakeholders based on wider socio-economic and feasibility considerations. Key challenges will be ensuring a fair and balanced approach to addressing the different pressures and effectively managing competing demands for limited resources.

The following flow chart provides a framework to assist decision making on prioritisation and associated measures at a regional and local level.

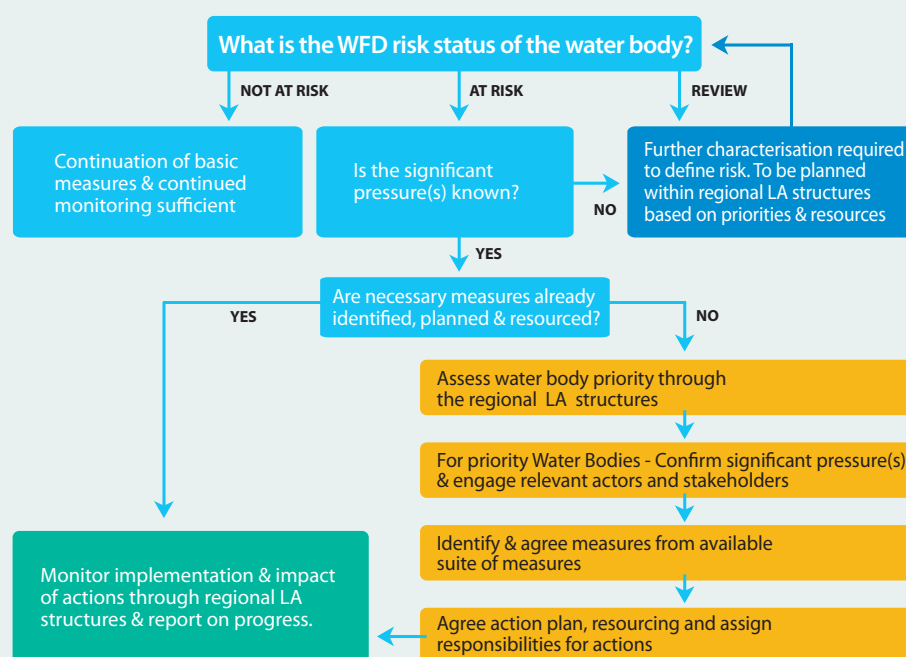


Figure 10.2: Flow chart outlining decision making on prioritisation and associated supporting measures at a regional and local level.

For those 1945 water bodies meeting or expected to meet the requirements of the WFD continued application of basic measures, along with continued monitoring, is envisaged as sufficient. For the 1517 water bodies at risk of not meeting the requirements of the WFD, the potential for better targeting of basic measures, the implementation of best practice, and/or the prioritised implementation of appropriate supplementary measures should be explored. As previously set out, the implementation of currently available supplementary measures will be prioritised and actioned through the Regional Local Authority structures. Finally, for 1313 water bodies where the risk is not currently understood and further characterisation is required, investigative assessments will be necessary, where resources allow. These will assess the risk, identify the significant pressures where necessary, and, where appropriate, prepare a plan of action. The 4 year Regional Integrated Catchment Management Programmes should provide the appropriate framework to outline the progress planned in each regard at a regional level.

10.4 Monitoring and evaluating the implementation of measures

The monitoring of implementation of planned measures, and the evaluation of the success of measures, will be central to ensuring effective implementation of this RBMP. Whilst the NCMC will ultimately oversee the implementation of national measures, it is also important that the NTIG with the support of the regional structures monitor the impacts of measures at a regional and national level.

In terms of the regional and local measures, the Regional Integrated Catchment Management Programmes should set out the details of planned interventions that can be monitored over time. The programmes should provide information such as the following:

- The process for, and outcome of, the agreed prioritisation of areas and actions
- The agreed list of areas (water bodies and/or sub-catchments) prioritised for action
- The planned measures for each prioritised area, the action plan for implementation of these measures, the responsible bodies, the assigned resources, and the expected implementation timelines
- The expected outcome for each prioritised water body.

A critical aspect of ensuring implementation of this RBMP is that the implementation of measures in the regional work programmes are continuously monitored and evaluated. Each regional committee will, therefore, produce a concise annual report which will provide an update on implementation progress and an evaluation of the measures implemented. This reporting should be integrated with the WFD application insofar as is possible. These reports will be a critical input to both the NCMC and WPAC. These annual reports should follow the structure of the regional work programmes outlining progress with respect to the plans set out in those programmes.



Section 11:

Communication and public & stakeholder engagement

Article 14 of the WFD requires member states to encourage the active involvement of all interested parties in the implementation of the Directive, in particular in the production, review and updating of the RBMP. While public consultation formed a central part of developing the first cycle plans, public and stakeholder engagement was less successful during the implementation period. This was a clear message from the consultation processes for this draft RBMP. Two main issues emerged in this regard. Firstly, how could non-governmental organisations better contribute to policy development at the national level? Secondly, how might public and stakeholder engagement at the regional and local level contribute to delivery of the plan itself?

Addressing these issues requires an approach that can facilitate engagement with national policies and measures – and also ensure engagement with regional and local implementation on the ground. It is proposed to set up a National Water Forum to progress the former, whilst the Local Authority Waters and Communities Office will lead on developing the latter.

11.1 National Water Forum

The Government recognises that public and stakeholder engagement on this draft RBMP, implementation of the finalised plan, and on other water issues is vital to achieving our environmental objectives. Raising public awareness of water as an environmental, social and economic resource is also recognised as essential to improving how we manage this valuable resource.

In this context, the Government will establish a national water forum to facilitate stakeholder engagement on all water issues. The forum's terms of reference will provide the opportunity to debate and analyse, amongst other things:

- water as a resource
- issues of water quality
- rural water issues
- issues affecting customers of Irish Water; and
- implementation of the WFD.

The forum will consist of members representing organisations and sectors with an interest in water issues. These are likely to include: consumer groups; Irish Water customers; community groups, river trusts and river associations; groups that participate in aquatic activities such as fishing and water sports; sectors with a particular interest in water issues such as the agricultural sector; the Community and Voluntary pillar; the Environmental pillar; and organisations representing rural Ireland and the group water scheme sector.

The national forum will have discretion to determine its own work programme and means of communicating its views and analysis. Its work and output will be completely independent. The Government envisages that the forum will meet several times a year at plenary level. Forum sub-groups will debate and analyse the five aforementioned themes.

Through ongoing debate and analysis, the Government expects a permanent national water forum to enhance public understanding of water as a scarce, costly resource to abstract, treat and supply, one that should be conserved, protected and used sustainably. The forum will be well positioned to inform public views on the links between clean water supplies, good water quality and public health, and the value of water as a resource. Monitoring public understanding and awareness of water issues is something the forum may consider as part of its work programme.

The findings and outputs of the National Water Forum will be taken into account by both the Water Policy Advisory Group (WPAC) and the National Co-ordination and Management Committee (NCMC) in terms of informing both national policy and the implementation of the second cycle RBMP.

11.2 Local Authority Waters and Communities Office

The National Water Forum is proposed as a way of ensuring public and stakeholder engagement and facilitating input into the policy development processes. However, equally important in terms of ensuring the success of this plan is that the public and stakeholders are engaged at regional and local level – including in terms of supporting catchment based approaches to improving water quality and in the terms of the development and implementation of measures on the ground.

To achieve this, the national Local Authority Waters and Communities Office has been established. It will drive public engagement and consultation with communities and stakeholders and will co-ordinate these activities across all 31 Local Authorities. The office is operated by Kilkenny and Tipperary County Councils, for all local authorities, on a shared services basis. The full staff complement consists of 3 regional co-ordinators, who are further supported by 3 specialist support officers and 12 Community Water Officers located in centres throughout the Republic of Ireland. The 3 specialist officers focus on funding, communications and marketing, and technology and research respectively.

The Local Authority Waters and Communities Office has already begun engagement across Local Authorities through regional information sessions and meetings with management teams and Strategic Policy Committees. Initial public engagement has also taken place through the Public Participation Networks, Local Community Development Committees, LEADER Groups and Partnerships, sectoral interest groups, Rural Development companies, the Irish Local Development Network and wider community groups.

The success of community led projects such as that run by IRD Duhallow, with the assistance of LEADER and LIFE funding, is a good example of a bottom-up approach to local governance. The LEADER programme, 2014 – 2020, has three themes one of which is *“Rural Environment, including the protection and sustainable use of water resources, the protection and improvement of local biodiversity and the development of renewable energy”*. Such development companies have a record of active community involvement in delivering programmes and are ideally suited to progressing and leading on community wide participation in waters.

The benefits of community stewardship in relation to water management are also evidenced through the experiences of the Rivers Trusts across the UK and, more recently, in Ireland. For the catchment based approach to be successful it will require all stakeholders including Local Authorities, Public Authorities, Non-Government Organisations and Communities to cooperate and work together for common goals. LAWCO will have a vital role in making such co-operation a reality on the ground across the country.

Funding will be critical if communities are to be mobilised and empowered to take on a greater role in the management of their local water environment. LAWCO will offer technical advice and assistance to local authorities, community and voluntary groups on local, regional, national and EU and corporate funding streams with a connection to water management.

Community engagement will require real participatory structures where communities can have their voices heard and listened to, and where they can be included in the decision making process. Education and awareness campaigns to deliver the right message to the right groups in the right way will also be required. Results and lessons learnt from projects and initiatives with a connection to water can be shared widely on social media platforms, thereby facilitating knowledge and information transfer between communities.

11.3 Knowledge sharing and networking

Effective catchment management will require competent authorities, stakeholders, and the public to understand and integrate a huge range of information about individual catchments. This includes: how people use the land and waterbodies, and what livelihoods are supported; the geography and geology of an area, looking at how all the water flows both above and below ground from where it falls as rain to the sea; possible sources of pollution, including urban waste water treatment plants, septic tanks, physical modifications, and runoff from farming, forestry and landfills; and being able to identify the benefits of good quality water in an economic and social context.

A key knowledge sharing tool for this purpose is the catchments, ie website which presents maps and data on the 46 catchments, 583 sub-catchments and 4,829 waterbodies. Charts are available for many waterbodies, presenting trends in key biological and chemical indicators, which can help people to understand how healthy they are, and the possible causes of any changes. This sharing of knowledge from the characterisation process will allow better targeting of measures. Further improvements and additional information on implementation actions will be made available via this channel during the operational period of the plan so that all stakeholders including the public have access to up to date environmental information to inform their actions. Furthermore, as implementation progresses this website will also become a tool for the sharing of knowledge in a wider sense, for example, identifying and sharing best practice examples from across the river basin district. This will be complimented by the continued publication of the quarterly Catchments newsletter which will present both scientific information and highlight best practice examples of implementation from across the country.

Another key requirement for the successful implementation of this plan is to ensure effective knowledge sharing and networking amongst experts. Whilst WPAC, NCMC and NTIG will provide forums for information sharing at a high level – ensuring effective knowledge sharing and networking at all levels will be equally important. The EPA has the lead role with regard to such networking issues, and will continue to develop this over the period of this second cycle. Significant progress has already been made in this regard with the establishment in 2014 of the Catchment Management Network and associated working groups.

11.4 Integrating stakeholder and public engagement with implementation

As highlighted throughout this section, communication and public engagement are seen as central to ensuring effective implementation of this plan. A key issue therefore is how the communication structures and tools outlined above integrate with the implementation structures set out in the previous section.

Whilst the National Water Forum will have discretion to determine its own work programme and means of communicating its views and analysis, it is envisaged that the outputs and findings of this Forum will feed into the work of the WPAC and the NCMC. This should ensure public and stakeholder input into national policy development and into the high level implementation of this plan.

A central aspect of the implementation structures set out in this plan is the regional and local delivery through Local Authority structures. Co-ordination at national level by the Local Authority structures is also seen as important in terms of ensuring consistency of implementation and promoting knowledge sharing. The work of the LAWCO must be effectively integrated with the local authority regional structure and with individual local authorities. Equally, the local authority regional structures must ensure that they effectively engage and work with the public and stakeholders. A specific example would be to ensure that effective communication and knowledge sharing enables initiatives such as the National Sustainable Dairy Forum to link into the regional and local implementation structures on the ground.

Finally, the catchments.ie website will provide an important tool for linking engagement with implementation. This tool will provide for up to date information on water quality, environmental objectives, implementation of measures and outcomes to be communicated in a way that all parties, whether bodies with statutory functions, industry stakeholders, non-governmental organisations or the public, can stay informed, share knowledge and effectively contribute to the implementation of this plan.

11.5 Communications and public & stakeholder engagement – principal actions for the 2nd cycle

The follow key actions in the area of communications and stakeholder engagement will be developed over the course of the second cycle RBMP:

1. We will establish a National Water Forum to facilitate stakeholder engagement on all water issues, including implementation of the WFD.
2. The Local Authority Waters and Community Office will drive public engagement, participation, and consultation with communities and stakeholders, and co-ordinate these activities across all 31 Local Authorities
3. LAWCO will work to ensure public and stakeholder engagement results in meaningful public and stakeholder participation in the catchment management approach across the river basin district.
4. EPA will continue to lead on networking and knowledge sharing through NIECE, the Catchment Management Network, and associated working groups, the Water Framework Directive application, catchments.ie website and the catchments newsletter. The WFD and catchments.ie website will act as both an information and data repository and as a knowledge sharing tool to allow better targeting of measures and co-ordination of implementation
5. We will ensure that communication and knowledge sharing activities of both LAWCO and the EPA are integrated with the implementation structures and feed into both policy development and the implementation of this plan.

Section 12:

Water quality

monitoring

The EPA has overall responsibility for establishing and managing the WFD monitoring programme. A number of public authorities have been assigned responsibilities by the EPA for elements of the monitoring programme under Article 10 of these regulations.

A technical review of the national WFD monitoring programme is currently underway to ensure that the network is optimally designed for the second RBMP cycle up to 2021. The review is being undertaken in conjunction with other agencies responsible for elements of the programme.

The aims of the review are to:

- Review the existing network and its sub-networks to determine what changes are required
- Consider the need for enhanced investigative monitoring to deliver evidence of ecological impacts and inform supplementary measures
- Align the monitoring network and sub-networks with the results of the characterisation risk and the knowledge gained from that process
- Review and confirm responsibilities for the various sub-elements of the monitoring programme.

The review will be concluded during 2017 with a view to applying the revised programme from 2018 when the new plan comes into operation.

The EPA will also investigate the factors contributing to the significant number of improvements and dis-improvements in water status observed across approximately 900 water bodies over the first river basin planning cycle.

Section 13:

Expected outcomes of the second cycle RBMP

This River Basin Management Plan sets out the measures aimed at protecting our water bodies and addressing the pressures on those water bodies at risk of not meeting the objectives of the WFD. The approach adopted towards implementation is to prioritise water bodies for action and to ensure effective delivery of environmental outcomes through coordinated intervention across a range of stakeholders.

This approach reflects the scale of the challenge in protecting and restoring water status and the need to make best use of available resources. As outlined in Section 6 the implementation priorities are, in summary:

- (i) full implementation of existing directives
- (ii) preventing deterioration
- (iii) meeting the water related objectives for protected areas
- (iv) protecting and restoring high status objective waters, and
- (v) targeted actions in focus catchments

These priorities are not mutually exclusive – for example preventing deterioration, achieving protected area objectives and achieving high status objectives all have significant crossover in terms of the water bodies being targeted.

As outlined in Section 10, the decisions on which water bodies will be targeted for action will be made through the local authority led regional structures, supported by EPA scientific analysis and evidence-base. Individual water bodies selected for prioritisation will be agreed with relevant stakeholders taking into account the priority objectives set out in this plan and having regard to the available scientific evidence and wider socio-economic and feasibility considerations. Therefore, this section aims to provide a picture of the potential scale of the challenge that arises from the above priorities and the broad level of ambition for the implementation of supporting measures in particular.

In more general terms, the development of new approaches to measures, improved implementation structures, and new structures for public and stakeholder engagement will also be important outcomes during this second cycle. These include, for example; the broad knowledge exchange proposals for agriculture and in particular the industry-led efforts now proposed through the National Dairy Sustainability Forum; the proposal to examine the feasibility to progress a solution to enhance fish connectivity in the Lower Shannon; the strengthened national, regional and local implementation structures set out in this plan, and; the improved structures put in place to ensure better public and stakeholder engagement and communication. Whilst the impact of these actions on water quality are not quantifiable – successful implementation of these measures are central to our approach to catchment management for this plan.

13.1 Ensuring full implementation of relevant EU legislation

As previously noted the Irish Water Business Plan and Irish Water Capital Investment Plan set compliance with the UWWTD and meeting requirements for protected area as key objectives for investment decisions. The expected investment in the period to 2021 will result in upgrades to 105 waste water treatment plants. These works will positively impact across a wide range of water bodies, including through downstream effects. The proposed works will assist with preventing deterioration and contribute to achieving status improvements. The Irish Water investment is particularly important in terms of achieving our protected area requirements.

On the basis of this investment we expect that by 2021:

- Compliance with the requirements of the UWWTD will be largely achieved.
- 6 currently non-compliant bathing waters will achieve compliance
- 16 urban agglomerations discharging to nutrient sensitive areas that are currently non-compliant will meet the requirement for more stringent treatment under the UWWTD
- Urban wastewater discharges in the vicinity of shellfish waters will be assessed to determine if disinfection of the effluent is required and any necessary measures will be put in place.
- Projects are planned for waste water treatment plants in 10 agglomerations discharging into waters containing designated freshwater pearl mussel SACs, and a further 11 agglomerations discharging into other water dependant SACs.

The full impacts of these interventions are complex, and modelling of the impacts on status to 2021 will be progressed during 2017. Furthermore, with regard to collection systems, in the period to 2021 Irish Water will complete drainage area action plans for 44 urban areas, many of which intermittently discharge to water bodies at-risk. This will identify the work needed to improve collection systems to meet environmental objectives, and facilitate the targeting of future investment in the period to 2027.

Whilst it is more difficult to assess the impact of the Nitrates Actions Programme on specific water bodies, the NAP has resulted in a decline in average nutrient load, as detailed in Section 3. Further analysis is necessary with regard to changes in water status during the first cycle; however, the NAP will continue to contribute to water quality in general terms, preventing deterioration and potentially supporting status improvements for some water bodies during this second cycle.

13.2 Preventing deterioration, meeting high status objectives, and meeting protected area objectives

The risk characterisation process has to date identified 1,360 water bodies that are at risk of not meeting their objectives. Whilst in some instances more tailored implementation of existing measures may resolve this risk in time, in general it is likely that additional supporting measures will be required for these water bodies to meet the required objectives. Before setting out the proposed scale of ambition for the implementation of supporting measures, it is important to understand the scale of the challenge presented in addressing the three priorities of (i) preventing deterioration, (ii) meeting the high status objectives, and (iii) meeting the water related objectives for protected areas.

A total of 581 at risk water bodies, from the 1,360 identified as at risk, emerge from these three priorities. The complex interactions between these three priorities are set out in the figure below. For example, 29 water bodies of the 581 which emerge from this prioritisation are covered by each of the three priorities – that is, they have high status objectives, are within water dependant SACs, and have deteriorated during the first cycle.

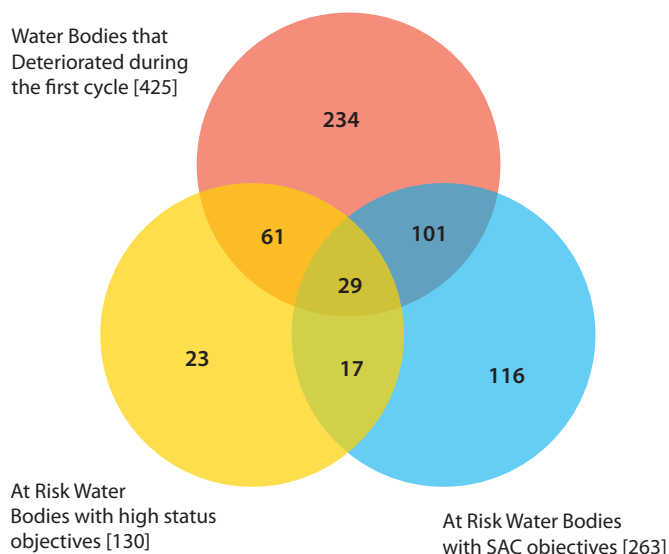


Figure 13.1: Diagram illustrating the interactions between the 581 at risk water bodies identified on the basis of the priorities to prevent deterioration, and achieve high status and SAC water related objectives.

In summary, taking account of the above interactions, these 581 water bodies comprise:

- 425 water bodies that have deteriorated during the first cycle and need to be restored.
- 130 high status water bodies at risk of not meeting their objectives
- 263 water bodies are at risk of not achieving their SAC water related objectives

Each of these 581 water bodies will be considered by the local authority led regional implementation structures, which will aim to deliver supporting actions in as many as is feasible. The

EPA characterisation work has identified that 211 of these 581 water bodies may be more feasible to address in the short term, for example because they are subject to single pressures and/or pressures for which identified measures are available. For water bodies with more complex problems investigative assessment would be required during this second cycle to better understand the pressures and provide tailored measures during the third cycle.

With regard to the protected area objectives (see table 13.1 below), as noted in the previous section, the planned investment through the Irish Water investment plan is expected to result in good progress during the second cycle with regard to compliance of bathing waters and nutrient sensitive areas, in particular. Furthermore, specific measures already in place or in development to support the achievement of water quality objectives in fresh water pearl mussel SACs. For drinking water protected areas it is expected that 353 drinking water source risk assessments will be in place by 2021 – with the remainder completed by 2027.

Protected Area Requirement	Number of WB/areas with requirement	Number meeting requirements in 2012-2016	Expected number meeting requirements in 2021
Drinking Water Protection	1,277 (Public)	55 (Public)	353 (Public)
(Source risk assessments)	360 (Group)	208 (Group)	299 (Group)
Bathing Waters	134	128	134
Shellfish Waters	64	48	56
Nutrient Sensitive Areas	42	26	42

Table 13.1: Expected outcomes by 2021 for protected areas

13.3 Focus catchment programmes including targeted actions

The priorities set out in this plan include developing and implementing focus catchment programmes to address two broad aims. Firstly targeting actions in sub-catchments with water bodies that are close to achieving their water objectives and where the evidence suggests improvement is likely with appropriate intervention, for example, where there are single significant pressures that are feasible to address in the short term. Secondly, developing sub-catchment programmes that aim to address issues that require multi-disciplinary and cross agency approaches. The former aspect is expected to deliver status improvements during the second cycle, whereas the latter may deliver some improvements but will largely involve developing a better understanding of environmental problems and help to develop appropriate solutions to be progressed for the third cycle. The decisions on the actual sub-catchments to be targeted will be made through the local authority led regional implementation

structures, with the views and inputs of stakeholders critical to ensuring the success of these pilots. The aim will be to get a mix of focus sub-catchments that provide an appropriate coverage of the significant pressures identified and an appropriate balance in geographic and sectoral terms. It should also be noted that the regional and local structures may choose to integrate priorities, for example, by targeting focus sub-catchments towards predominantly high status waters within the region. It would be expected that around 30 such focus sub-catchments, likely covering around 150 water bodies, would be initiated over the course of this second cycle.

13.4 Other expected outcomes of the second cycle plan

In addition to the implementation of defined supporting actions on specific water bodies, to be decided upon and delivered through the regional implementation structures, another important theme within this plan is the more general development of (i) new approaches to measures, (ii) improved implementation structures and (iii) structures for public and stakeholder engagement. Whilst improvements in water status cannot be directly related to these more general developments they form a central part of this plan, and it is important that we ensure successful outcomes for these developments also.

One of the key new approaches to measures relates to the broad knowledge transfer proposals for agriculture and in particular the industry-led efforts now proposed through the National Dairy Sustainability Forum. The successful development of these knowledge transfer proposals will be central to ensuring we better manage current pressures, and ensure sustainable future growth within the sector. Key outcomes will be that the targeted number of farmers is met, the NDSF pilots and schemes develop as planned, and that the knowledge transfer can be shown to achieve best practice on the ground. Another key measure is the proposal to develop and progress a technical solution to enhance fish connectivity in the Lower Shannon. Whilst the ultimate outcome here is the development of such a solution – putting in place the necessary structures for delivery of such a project, assigning responsibilities amongst relevant agencies, and developing an appropriate proposal will be key outcomes necessary before implementation of a final agreed project.

Better implementation, in particular of supporting actions, is also a central theme in this plan. The successful development of the proposed implementation structures and effective monitoring of actions and outcomes are critical to the success of this plan. The functioning of the regional implementation structures, and the integration of these regional structures into national policy structures, are of particular importance – in particular where action may be needed at national policy level to mitigate potential barriers to progress. Finally, with regard to public and stakeholder engagements, successful development of both LAWCO and the National Water Forum will be central to ensuring identified shortcomings in this regard during the first cycle are addressed.

13.5 Summary of expected outcomes

Based on the information set out in the draft plan, we hope to achieve the following over the period to 2021:

- Investment in urban waste water collection and treatment will deliver projects in 105 urban areas and achieve compliance with the requirements of the Urban Waste Water Treatment Directive.
- Due to this investment we expect 6 non-compliant bathing waters and 16 non-compliant discharges to nutrient sensitive areas will meet their requirements.
- 353 public drinking water source risk assessments will be in place.
- The implementation of other basic measures will continue to prevent deterioration and support water quality improvements. In particular the Nitrates Action Programme (NAP) will continue to provide a good environmental baseline for the agriculture sector.
- Based on the priorities of preventing deterioration and meeting high status and SAC objectives, 581 at risk water bodies are identified as requiring additional supporting actions. Whilst the specific water bodies to be prioritised for action are to be decided upon through the regional committee structures, we expect action in the vast majority of these water bodies, including investigative assessments to identify the most appropriate solutions for the specific issues identified.
- A minimum of 30 sub-catchment pilot schemes will be developed targeting sub-catchments with water bodies close to meeting their objectives and also sub-catchments with more complex pressures requiring multidisciplinary and cross-agency approaches. The latter will have the main goal of building knowledge for the third river basin planning cycle.
- In total therefore we would expect supporting measures to be implemented in approximately 600 to 700 water bodies over the period of this cycle. On the basis of these actions, we would expect to achieve general water quality improvements in many of these water bodies. However given the known difficulty in achieving status improvement, we envisage that these actions will likely result in some 150 additional water bodies showing improvement in status by 2021. Further work will be undertaken in 2017 to refine this estimate.
- The remaining water bodies which fall outside the prioritisation for this plan will still benefit from the basic measures, and as resources allow will be targeted for investigative assessments through the processes at regional committee level.
- Key high level actions such as knowledge transfer in agriculture, the National Dairy Sustainability Forum and assessing the feasibility of implementing measures to improve fish migration in the Lower Shannon catchment will be assessed.
- Co-ordinated national, regional and local implementation structures will be put in place to improve implementation and monitoring of actions.
- New public and stakeholder engagement structures will be put in place. LAWCO will drive bottom up public engagement and the National Water Forum will facilitate meaningful public and stakeholder engagement in water policy development.

Section 14: Next Steps

This draft plan will now be open for public consultation for a 6 month period until Thursday 31st August 2017. The details of the consultation process are set out at the start of this document.

The Department of Housing, Planning, Community and Local Government will be engaging directly with stakeholders throughout this process. The Department plan to host an event in May or June 2017 to allow a direct engagement with interested parties. Organisations or individuals who may be interested in attending can contact rbmp@housing.gov.ie request further details and attend this event.

Early submissions would be welcomed as this will allow more time to consider responses and how we can best adapt this draft plan to ensure that the final plan is informed by the views expressed in the consultation process.

Throughout 2017 work will continue both in terms of analysing and understanding the emerging water quality monitoring data for the period 2013-2015, and completing the characterisation of our River Basin District. Work will also continue on further developing the proposed measures outlined in this draft plan, informed by the views of respondees to this process. It is intended to publish the final RBMP by December 2017, following approval by the Minister. The final plan, and associated documents and data, will then be reported to the Commission in line with the requirements of the Water Framework Directive.







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