



**Cyfoeth  
Naturiol**  
Cymru  
**Natural  
Resources**  
Wales



Llywodraeth Cymru  
Welsh Government

# Western Wales River Basin Management Plan 2015 – 2021 Summary

December 2015

## Contents

<b>1. Introduction</b> .....	3
1.1 The River Basin Management Plan.....	3
1.2 Finding your way around the River Basin Management Plan.....	4
1.3 Scope with other plans and programmes.....	6
1.4 Responsibility for implementing this plan.....	8
1.5 The natural resources management approach.....	10
1.6 Monitoring and reporting progress over the next six years.....	12
<b>2. Current status and progress review</b> .....	14
2.1 The Western Wales River Basin District.....	14
2.2 Current status of the River Basin District.....	16
2.3 Summary of the significant water management issues.....	18
2.4 Delivery of actions.....	23
2.5 Deterioration.....	24
2.6 Progress in achieving first cycle objectives.....	25
2.7 Review of first cycle progress.....	26
<b>3. Programme of Measures</b> .....	27
3.1 Overview of the Programme of Measures.....	27
3.2 Delivery programmes.....	27
3.3 Summary programme of national measures for significant water management issues.....	38
3.4 Summary programme of local measures.....	48
<b>4. Environmental objectives and outcomes</b> .....	49
4.1 Water body objectives.....	49
4.2 Protected Area compliance and objectives.....	51
4.3 Outcomes for 2021.....	54
4.4 Economic appraisal.....	55
<b>5. Third Cycle Planning - Planning ahead and the challenges for 2021 – 2027</b> .....	56

# 1. Introduction

## 1.1 The River Basin Management Plan

Under the EU Water Framework Directive (WFD) a management plan is required for each River Basin District (RBD). The Western Wales River Basin Management Plan (RBMP) was first published in 2009. This document is the first update to that plan and will subsequently be reviewed in 2021 when a further update will be published. River basin management is a continuous cycle of planning and delivery.

The purpose of this management plan is to protect and improve the water environment for the wider benefits to people and wildlife. In order to achieve this, the plan includes a summary of the Programme of Measures needed to achieve the objectives of the WFD together with the predicted environmental outcomes over the next six years. Collectively, the approach and actions set out in this plan will have an effect on all types of water across the catchments that make up the management plan, this includes; rivers, lakes, canals, groundwater, wetlands, estuaries and coastal waters. The plan aims to be integrated at the catchment scale ensuring a connection across the wider environment for people and wildlife, from catchment to coast.

The environmental objectives in this plan are legally binding and have been approved by the Welsh Minister for Natural Resources. It fulfils the requirements of the EU WFD and statutory guidance from government. It replaces the plan published in 2009, except for the economic analysis of water use (2009 Annex K) and adapting to climate change (2009 Annex H).

The plan includes information on;

- **Classification of water bodies** – The baseline status in each water body. This enables us to understand the current condition of the water bodies including all the quality elements. Preventing deterioration from this baseline is a key objective of this plan, and also one of our greatest challenges in protecting the water environment.
- **Summary of Programme of Measures to achieve statutory objectives** – These include statutory objectives for Protected Areas. The programme sets out the actions over this planning cycle and forward planning towards the third cycle. It includes a framework to review and track delivery of the actions to be taken over the next six years with a focus on collaborative working and the delivery of multiple benefits for people and wildlife.
- **Statutory objectives for water bodies** – Legally binding objectives have been set out. These have been set for each quality element in all water bodies, including an objective for the water body as a whole. The objective is to aim to achieve good status or potential by 2021. In some instances we have extended the deadline to 2027 or set an objective of less than good where this is justified on the basis of natural conditions, ecological recovery time, technical feasibility or disproportionate cost.

Locally, this plan has been influenced by the feedback from the consultations that were held over the last three years. In particular we have taken on board comments made to ensure this plan better reflects;

- Clarification on the changes to standards, details on the amended standards are in the **Annex**.
- Planned or underway actions set out in the Prioritised Improvement Plans (PIPs).
- The different types of waters and is less river focused, in particular including more information on our estuarine and coastal waters, and highlighting that all actions in the freshwater environment will lead to reducing input of nutrients and chemicals to the estuarine and coastal environment.
- Sets out what actions will happen where, when, who is/ can be involved and maximising wider benefits for society and the environment through partnerships.
- An approach to monitor progress with delivery.
- Usable support tools bridging the gap between the strategic framework, catchments and delivery to help partners deliver locally. Including opportunities for sharing data and modelling outputs.

## 1.2 Finding your way around the River Basin Management Plan

RBMPs are strategic documents. They provide both detailed and summary information. Whilst the best intentions have been made to ensure this plan is accessible, the document is presented to meet the statutory requirements of the Directive. A glossary of terms is included in the **Annex**. If you are unable to find the information you require from this plan please contact [WFDWales@naturalresourceswales.gov.uk](mailto:WFDWales@naturalresourceswales.gov.uk) and our WFD Team will help you.

The RBMP is made up of several documents and an interactive web based tool. These are outlined in figure 1 and described below. The supporting documents which contain the required statutory assessments of the RBMP are also outlined.

Figure 1: Contents of the RBMP and supporting documents

River Basin Management Plan	
River Basin Management Plan Summary	Summary of the environmental objectives and programme of measures
River Basin Management Plan Overview Annex	Summary of the technical, economic and engagement processes used to develop this plan
Water Watch Wales	Interactive maps which meet requirements under Annex VII of the Directive.
River Basin Planning Progress Report for Wales 2009 – 2015	Summary of the progress since the first plan
Inventory of Emissions, Discharges and Losses of Substances & Chemical Analysis	Diffuse and direct discharges in each RBD for chemicals where data available and chemical analysis information, e.g. limits of quantification.
Protected Areas Register	Updated register of Protected Areas in the river basin district
Supporting documents	
Statement of Particulars	Meets statutory requirements of the Strategic Environment Assessment Regulations
Habitats Regulation Assessment	Meets statutory requirements of the Habitats Regulations

## The River Basin Management Plan

### **‘Western Wales River Basin Management Plan 2015 – 2021, Summary’ (this document)**

This summary describes the current condition of the RBD and what we have achieved since 2009, the Programme of Measures for improving the water environment by 2021, water body objectives and a forward look to the planned review in 2021.

### **‘River Basin Management Planning Overview Annex’ (Annex)**

The **Annex** provides the technical detail for Wales behind the decision making which has shaped the RBMP. It refers to a number of supporting documents for the more technical information and guidance.

### **‘Water Watch Wales’ – catchment summaries, data, and maps**

There is a **catchment summary** document for each of the nine RBD catchments in the Western Wales RBD, these provide more local detail reflecting both actions that can be taken and opportunities for partnerships, in particular for the voluntary sectors. The summaries are intended to be a practical guide to aid the delivery of locally targeted actions and partnerships. The documents have been shaped by the outputs of catchment workshops and the positive feedback received from the consultation on the draft plans in 2014 to 2015.

Much of the information referred to in this document is best presented in map or spreadsheet format. Information on the current state of the water environment, measures and objectives for improving it can be found on **Water Watch Wales**. This is an interactive spatial web based tool that provides supporting information and data to assist partners. It enables the user to navigate to their area of interest and review the available information about that specific area.

### **‘River Basin Planning Progress Report for Wales, 2009 – 2015’ (Progress Report)**

The **Progress Report** sets out the detailed information on the current state of the water environment including analysis of improvements and deterioration since the 2009 plan. It includes a review of the outcomes since 2009 and a look at the lessons learnt which will help us to improve delivery over the next six years. A summary of this is presented in Section 2.0 of this summary.

### **‘Inventory of Emissions, Discharges and Losses of Substances and Chemical Analysis Information’ (Inventory of Emissions)**

The Environmental Quality Standards Directive (2008/105/EC) (as amended by Directive 2013/39/EU) is a ‘daughter directive’ of the WFD that have subsequently specified the assessment, reporting, and objectives required for Chemical Status. The inventory of emissions, discharges and losses of priority substances and pollutants is required under The Environmental Quality Standards Directive. It includes diffuse and direct discharges in each RBD for chemicals for which data is available. The inventory will be used to verify that emissions, discharges and losses are making progress towards reduction or cessation objectives for chemicals listed under the Directive. The chemical analysis information is required by the Priority Substances Directive to present the limits of quantification of the methods of analysis applied, and information on the performance of those methods in relation to minimum performance criteria.

## Protected Area Register

The register of the Protected Areas lying within the river basin districts has been reviewed and updated. It provides information on each protected area including: bathing (recreational) waters, shellfish waters, drinking water protected areas, Natura 2000, nutrient sensitive areas and Nitrate Vulnerable Zones.

## Supporting documents

### Strategic Environmental Assessment report (SEA)

The Environmental Assessment of Plans and Programmes Regulations 2004 (known as the Strategic Environmental Assessment Regulations) requires that a Statement of Particulars is made available as soon as reasonably practicable after the production of the plan. This document sets out how the wider environment has been taken into account by the plan, the reasons we are adopting the plan as proposed in light of other reasonable alternatives and also how we propose to monitor potential significant effects of the plan when it is implemented.

### Habitats Regulations Assessment (HRA)

A Habitats Regulations Assessment of the final updated RBMP has been carried out to consider whether the plan is likely to have a significant effect on any Natura 2000 sites. This concluded that the plan will have no adverse significant effect on European sites, and the delivery of statutory objectives to improve these sites. This has been published alongside the RBMPs.

## 1.3 Scope with other plans and programmes

This RBMP complements a range of plans and strategies across Natural Resources Wales and Welsh Government to help ensure both the sustainable management of the water environment and to achieve the wider objectives of other EU Directives such as the Habitats Directive and revised Bathing Waters Directive. Some of these have been referenced within this plan and Table 1 summaries some of these.

Table 1. Other plans and strategies related to water management

Issue	Plan/strategy title	Lead body
Flooding and coastal erosion	Flood Risk Management Plans	Natural Resources Wales
	National Flood and Coastal Erosion Risk Management Strategy	Welsh Government
	Shoreline Management Plans	Coastal Groups, which are local authority-led
	Catchment Flood Management Plans	Natural Resources Wales
	Local Flood Risk Management Strategies	Local authorities

	National Habitat Creation Programme	Natural Resources Wales
Climate change adaptation	Climate Change Strategy for Wales (2010)	Welsh Government
	UK National Climate Adaptation Strategy and Adaptation Plan	Government's Committee on Climate Change, Public bodies and utility companies
Water policy	Water Strategy for Wales and associated Action Plan	Welsh Government
Water supply	Water Resource Management Plans	Water Companies
	Drought Plans	Water Companies
Biodiversity	Nature Recovery Plan (under development)	Welsh Government
	Special Areas for Conservation/Special Protection Area core management plans	Natural Resources Wales
	Life + Natura 2000 Project Thematic Plans Natura 2000 Prioritised Improvement Plans (PIPs)	Natural Resources Wales
	Local Biodiversity Action Plan	Local Authorities/Local partnership
Invasive non-native species (INNS)	The INNS framework strategy for Great Britain	Great Britain non-native invasive species programme board
Agriculture	Rural Development Plan	Welsh Government
Forestry	Forest Design Plans	Natural Resources Wales
Recreation	Rights of Way Improvement Plans	Local authority

National Parks & Areas of Outstanding Natural Beauty (AONB)	National Park Management Plans	National Park Authority
	AONB Management Plans	Local authorities
Air quality	Air Quality action plans	Local authorities
Marine	Welsh National Marine Plan(proposed)	Welsh Government
	Bathing Water Priorities	Natural Resources Wales
	Marine Strategy Framework Directive Programme of Measures	Welsh Government
Chemicals	UK National Action Plan for the Sustainable Use of Pesticides (Plant Protection Products) 2013	Defra, Welsh Government, Scottish Government, DARDNI, HSE
	National Implementation Plan for the Stockholm Convention on Persistent Organic Pollutants 2013	Defra, Welsh Government, Scottish Government, DOENI

We are working to better align planning across other areas to enable wider benefits to people and wildlife. These include water resources and water quality, agriculture and rural land management, forestry, biodiversity, natural heritage and recreation.

#### 1.4 Responsibility for implementing this plan

Natural Resources Wales is responsible for producing the RBMP. There are, however, lots of organisations and individuals who are responsible for managing the RBD. These are often grouped in sectors. Table 2 below summarises the sectors together with the role they play. These include regulators, deliverers, experts and organisations representing the public in particular the voluntary sectors in particular the voluntary sectors through the Non-Governmental Organisations. All sectors should consider the general public's interest through their role.

Table 2. Sector groups and roles

Sector	Examples of members	Role: Regulatory	Role: 1. Deliverer (including operator and projects). 2. Knowledge, expertise and influence
Government and agencies (including Natural Resources Wales)	Includes UK and Welsh Government and devolved government bodies	✓	✓
Local government	Includes Councils and National Park Authorities	✓	✓
Mining and Quarrying	Coal mining, non-coal mining and quarrying	✓	✓
Navigation	Includes inland water ways (Canal & River Trust), port and harbour authorities	✓	✓
Water Industry	Water supply, water and sewage treatment	✓	✓
Agriculture and rural land management	Includes arable, intensive livestock, forestry and horticulture.		✓
Industry, Manufacturing and other Business	Includes chemicals, construction, food and drink, paper, textiles and metals also includes commercial fisheries (freshwater and marine)		✓
Non-Governmental Organisations (NGOs)	Includes local wildlife trusts, rivers trusts and coastal partnerships		✓
Recreation	Includes ramblers, canoeists, fisheries (fresh and marine)		✓

Sector	Examples of members	Role: Regulatory	Role: 1. Deliverer (including operator and projects). 2. Knowledge, expertise and influence
	water) and amenity groups		

Managing the water environment is not always best coordinated at the RBD scale. In Wales we are committed to area based natural resource management and the ecosystems approach. Our objectives are:

- To seek to achieve the sustainable management of natural resources.
- To achieve positive and sustained results for the water environment by promoting a better understanding of the environment and its interconnections at a local level.
- To encourage local collaboration and more transparent decision-making when planning and delivering activities to improve the water environment.
- To ensure improvements to the water environment are implemented in ways that optimise other environmental, social and economic benefits.

This approach will help develop more locally-informed RBMPs by providing a platform for engagement, discussion and decisions with much wider benefits. Natural Resources Wales plays a central role in the effective working of the ecosystem approach by supporting catchment based activities with evidence, expertise, advice and guidance.

The Western Wales RBD is also overseen by a liaison panel that represents those sectors shown in Table 2. This panel has been in place since the development of the first plan in 2009.

### 1.5 The natural resources management approach

Natural resource management is a key element of the Welsh Government’s legislative programme. The 2011 Welsh Government *Programme for Government* emphasises the importance of managing our natural resources, on land and sea, in a more integrated way. This is in line with its commitment to sustainable development as its central organising principle as now enshrined in law through the Well-being of Future Generations (Wales) Act. The Environment (Wales) Bill currently being considered by the National Assembly, together with the Planning (Wales) Act, and the Wales National Marine Plan, sets out a new statutory framework for the sustainable management of natural resources.

This new framework for managing natural resources, builds on the UN Convention on Biological Diversity ecosystem approach, defined as ‘an integrated strategy for the management of natural resources’. The Environment (Wales) Bill will legislate for a more joined-up management process, focused on delivering a healthier, more resilient Wales through delivering economic, social, cultural and environmental benefits.

Welsh Government and Natural Resources Wales are committed to working towards the sustainable management of natural resources through embedding the principles of sustainable management (as set out below) in all of our work. This approach is about managing the environment so that its different components are considered together, in particular, the resilience of ecosystems and the benefits that they provide. Most importantly, it emphasises that people themselves are part of ecosystems and so should be involved in decision making. This complements the advice from previous WFD consultations that we should take a catchment based approach which provides a clear understanding of the issues in the catchment and involves local communities in decision-making. We aim to improve the environment as a whole through the RBMP and greater collective action. There are already many good examples of partnership working and we need to build on these.

This starts by identifying the key strategic risks, priorities and opportunities for the sustainable management of natural resources, and then working through those issues and opportunities at a more local level. By recognising the range of tools that can be used to safeguard and deliver environmental benefits (of which RBMPs are one) it will ensure those challenges are tackled in a more integrated way – better reflecting the needs of that place. This approach is being trialled in three areas in Wales, the Dyfi, Tawe and Rhondda, and more information can be found about the trials on our website.

The natural resource management policy framework is still being developed in Wales but the RBMPs reflect the essential principles of the new approach in the following ways:

**Manage adaptively, by planning, monitoring and reviewing action**

The river basin management process promotes adaptive management. The condition of water bodies and progress towards achieving good or better status are regularly monitored. The RBMPs are reviewed and updated every 6 years. Any actions and measures are also reviewed as part of this planning process.

**Consider the appropriate spatial scale for action**

The natural processes we are working with, and the management processes we are aiming to influence, tend to work at different scales. Area based natural resource management processes should reflect this and aim to manage ecosystem services at the most appropriate scale, whilst taking into account the best management mechanisms for doing so. The WFD requires that we produce and review management plans at the RBD scale. But many of the problems facing the water environment are best understood and tackled at the catchment scale. This will help to tackle local issues such as pollution from diffuse sources which is a significant pressure across Wales.

**Promote and engage in collaboration and co-operation**

Natural Resources Wales is the competent authority for the WFD but only manages seven percent of Wales' land area itself. It is essential that we involve stakeholders, including local authorities, communities, developers and industry, throughout the process of drawing up and implementing the RBMPs.

**Take account of all the relevant evidence and gather evidence in respect of uncertainties**

To inform the development of the area based approach we need to use the best available evidence from a range of sources, building on both our knowledge and that of our

stakeholders and local communities. We will take a pragmatic approach to evidence and apply the principle of collect once, use many times.

The contents of this RBMP are the result of a significant evidence base, collected through our monitoring programmes, investigations and economic assessments.

### **Take account of the benefits and intrinsic value of natural resources and ecosystems**

Our ecosystems provide us with a wide range of services and benefits. We need to take all of these into account when we make decisions about how we use them, so that they provide multiple benefits for the long term. This includes taking into account their intrinsic value.

By working with others in catchments the aim is to:

- Understand the issues in the catchment and how they interact
- Understand the ways in which water and hydrological systems provide benefits to people, business, and support and sustain the wider environment
- Understand how the issues are affecting the current local benefits and future uses of water
- Involve local people, communities, organisations and businesses in making decisions by sharing evidence
- Identify which issues to tackle as a priority

### **Take account of the short, medium and long term consequences of actions**

To create a sustainable Wales we need to consider the opportunities and constraints Wales will face in the long term. This was considered as part of the Strategic Environmental Assessment along with consequences on the wider environment and cumulative/indirect effects. RBMPs consider long term objectives for improvement and are reviewed every six years.

### **Take account of the resilience of ecosystems**

A resilient ecosystem is one that is healthy and functions in a way that is able to address pressures and demands placed on it, and is able to deliver benefits over the long term to meet current social, economic and environmental needs. The new approach will need to plan to deliver multiple, longer term benefits for the environment and also for the economy and society – reflecting long-term well-being goals for Wales. Ensuring that actions contribute to the resilience of the supporting ecosystems and their functioning will be key to the long term sustainability of the services and benefits they can provide.

The actions proposed in this RBMP can take account of ecosystem resilience and deliver multiple benefits, for example improving land management in the uplands can have significant benefits in climate change resilience, carbon capture, flood storage and improved downstream water quality.

Further information on the benefits and potential constraints of measures on ecosystems, and consideration of the baseline for each ecosystem and the potential effects with and without the measures, can be found in the Strategic Environmental Assessment.

## **1.6 Monitoring and reporting progress over the next six years**

The effectiveness of this plan in delivering the objectives to protect the water environment, to aim to achieve good status. This includes the WFD reporting requirements, Natural Resources Wales' reporting and working with the Liaison Panels to track and report progress at the RBD and catchment scale. Many of our stakeholders have their own programmes in place and we aim to align these, where possible, through the work of the

Liaison Panels. This will collectively be set out in a Delivery Programme for the six year cycle which will direct the approach used; including setting milestones for reporting actions and outcomes, evaluation and review. This work will need to include steps to be taken where actions or outcomes cannot or have not been delivered enabling adjustments to be made across the programme. In some instances changes in the programme will need to be agreed across the sectors to ensure that the overall objectives of this plan are to be met. The delivery and effectiveness of the Programme of Measures (Section 3.0) and achieving the environment outcomes (Section 4.0) will be key indicators for reporting progress.

## 2. Current status and progress review

This section outlines the current status and review of progress in the RBD. This includes;

- the new baseline which will be used for future progress reporting to 2021. This is based on the standards, methodological changes and water body network introduced for the second cycle of River Basin Management Planning, including some updated standards, and size/length of some water bodies.
- an overview of progress made since 2009 based on the same water body network, classification tools and standards set in first cycle. Additional detail on progress made in the Western Wales RBD during the first cycle is provided in the **Progress Report**.

For further information on the changes between the methodology in the first and second cycle see the **Annex**.

### 2.1 The Western Wales River Basin District

The Western Wales RBD is shown on Figure 2, it covers an area of 16,653 square kilometres. It extends across the entire western half of Wales, from the Vale of Glamorgan in the south to Denbighshire in the north.

The main centres of population are restricted to the coastal strip and the westernmost part of the South Wales valleys. The main urban centres include Swansea, Bridgend and Neath in the south, Aberystwyth on the coast in mid-Wales and the North Wales coast including Colwyn Bay, Rhyl, Llandudno and Bangor. The RBD is primarily rural, with land mainly used for agriculture and forestry. Marine, oil and gas industries remain important economic activities, along with heavy industry such as the steel works at Port Talbot and commercial fisheries, shellfisheries and tourism, notably around the Welsh coastline.

The lakes, rivers, estuarine and coastal waters of the district are renowned for their fishing. Seventy per cent of the District's coastline is designated (under European Union Directives and UK law) for its environmental quality, including many world class bathing beaches and internationally important conservation sites. All groundwater in this RBD forms part of a Drinking Water Protected Area (DWPA).

There are large and valuable cockle beds at Traeth Lavan in the north and The Burry Inlet in the south. Mussels are harvested from natural beds in the Conwy and Dyfi and farmed in the Menai Strait on some of the most productive mussel beds in Europe. Much of the uplands is given over to livestock farming and commercial forestry. Dairy farming is dominant in the lowlands, particularly in Pembrokeshire and Carmarthenshire. The milder climate of South Pembrokeshire also allows for significant arable production.

The dramatic coast, bathing waters and the proximity of significant population also helps explain the importance of the coastal tourism industry. From 2007 to 2014 approximately £14.6 million has been spent on establishing the Wales Coast Path route which covers 870 miles along the Welsh coastline. Tourism is a major contributor to the Welsh economy (Wales Tourism Alliance – Wales Tourism Definitive Value Report, June 2012).

Many of the problems facing the water environment are best understood and tackled at the local scale. This RBD has been divided into nine management catchments;

- Clwyd
- Conwy
- Ynys Môn
- Llŷn and Eryri
- Meirionnydd
- Teifi and North Ceredigion
- Cleddau and Pembrokeshire Coastal Rivers
- Carmarthen Bay and Gower
- Tawe to Cadoxton

Further information on these catchments can be found in the supporting **Catchment Summary reports** available through **Water Watch Wales** together with additional supporting data and maps.

Figure 2. The Western Wales River Basin District



## 2.2 Current status of the River Basin District

The current status of the RBD in 2015 allows us to review progress made during the last six years and set out the foundation for this next cycle of river basin planning. Current status is assessed on the standards, methodologies and waterbody network introduced for the second cycle of River Basin Management Planning. In 2015, 225 waterbodies which is equivalent to 40% are in good or better overall status. 425 water bodies which is equivalent to 74% have an objective of good status or better to be achieved by 2021 however, there is a large degree of uncertainty that such a significant increase in achieving good status or better will be observed by 2021 as outlined in section 4.1. In Wales we plan to improve compliance with good status by delivering measures locally in an integrated way to achieve environmental improvements in WFD water bodies and Protected

Areas. This will include targeting an improvement to good status in 21 water bodies (equivalent to 4%) in WFD compliance by 2021.

This section sets out the baseline which will be used for future progress reporting to 2021. Table 3 shows the number and type of water bodies in the RBD for 2015 - 2021. This has changed since the first RBMP and will be the new baseline for the next six years. All lengths of rivers, streams or drainage channels in Wales are protected by our domestic legislation. WFD requires that we report the status of our water bodies and to do that (for example in the RBMP) we use a river line within that catchment. For the first RBMP, this river line (often referred to as the 'blue line') was derived from the 1:50,000 scale river network. This has been updated using the 'detailed river network'. This river line is purely a reporting network and it is this river line which appears on maps in the updated RBMPs. This revision of the network resulted in the removal of a number of small streams (i.e. those water courses less than 1km in length or with a catchment of less than 10 km<sup>2</sup>). The minimum size was in keeping with the original intention of the Directive. Even though these small waters are not reported, the WFD covers all bodies of surface water not just those represented as a blue-line on WFD maps. Where a stretch of water is too small to formally be a water body, or is too small to show up on a map of the water body, it is still protected by law from pollution, modification and abstraction and can still be improved where local actions and assessments deem it to be a priority. The water bodies are the reporting units and are the indicators of the health of the wider water environment. Natural Resources Wales assess the condition of these water bodies through monitoring which produces a classification. Further technical details on how this has been undertaken can be found in the **Annex**.

Table 3. Numbers of water bodies and type for 2015- 2021

Number of water bodies	Natural	Artificial	Heavily Modified	Total
River, canals and surface water transfers	379	2	47	<b>428</b>
Lake	25	2	37	<b>64</b>
Coastal	18	-	5	<b>23</b>
Estuarine	18	-	10	<b>28</b>
Groundwater	25	-	-	<b>25</b>
<b>Total</b>	<b>465</b>	<b>4</b>	<b>99</b>	<b>568</b>

The water body types are subdivided into surface waters (which includes rivers, canals, surface water transfers, lakes, coastal and estuarine water) and groundwater. Across Wales there are 904 surface water bodies, and 543 of these are within this RBD. There are 38 groundwater bodies across Wales, 25 of these are within this RBD. This includes the addition of new heavily modified water bodies (HMWBs) that have been designated as part of the first cycle review. The current status of these water body types is shown in Table 4 and Table 5, this forms the baseline for the next six years.

Table 4. Summary of ecological and chemical classification for surface waters 2015. Note that 2<sup>nd</sup> cycle chemical standards in biota have been used in classification where data is available.

No. of water bodies	Ecological status or potential					Chemical status	
	Bad	Poor	Mod	Good	High	Fail	Good
543	1	32	279	228	3	69	474

Table 4. Summary of chemical and quantitative classification for groundwater 2015

No. of water bodies	Quantitative status		Chemical status	
	Poor	Good	Poor	Good
25	0	25	13	12

In addition to the defined water bodies there are also a number of Protected Areas which need to meet the objectives and requirements that are relevant to their particular designation and use.

In addition to the defined water bodies there are also a number of Protected Areas which need to meet the objectives and requirements that are relevant to their particular designation and use. Most recent monitoring data of Natura 2000 water dependant habitats and species shows that 15% were favourable in the Western Wales RBD.

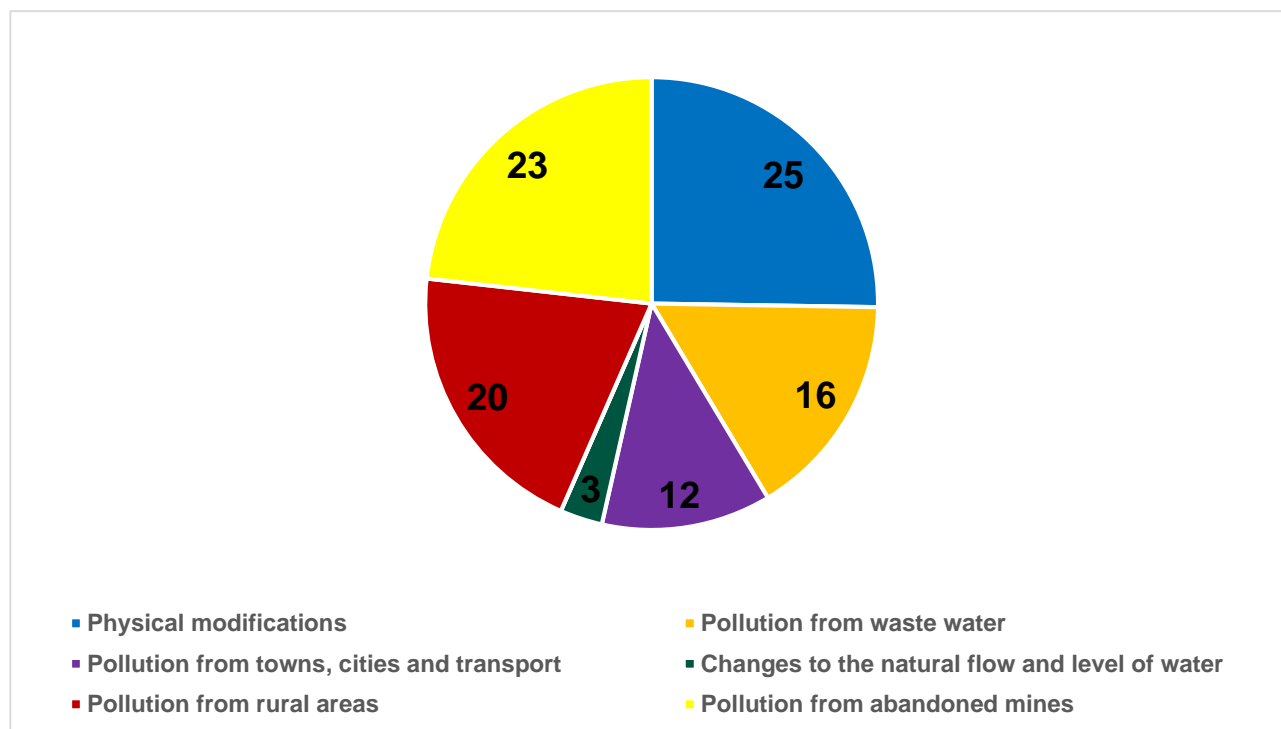
The EU also requires that Member States establish an inventory of emissions, discharges and losses of priority substances for each RBD alongside WFD characterisation analysis. The inventory was compiled using environmental monitoring and point source effluent discharge data. The inventory is intended as a baseline study in the first instance and the methodology and results can be found in the **Inventory of Emissions**.

### 2.3 Summary of the significant water management issues

The most important issues we believe that threaten the current and potential future uses of the water environment have been grouped into significant water management issues (SWMI) and are shown in Figure 3. These are based on the standards, methodologies and waterbody network introduced for the second cycle of River Basin Management Planning. These were reviewed in 2014 through public consultation as part of the ongoing river basin planning programme. These are the main issues that the planned Programme of Measures, set out in Section 3, will tackle to ensure protection and improvement of the water environment across the RBD. Section 3 also includes further detail on the main programmes that will be key to achieving the objectives and a summary of local actions. In some instances we will need to tackle some of the SWMIs working across various

sectors and with other organisations to be able to achieve our objectives, for example actions taken where there are failures resulting from nutrient inputs and bacteria from rural diffuse pollution and actions for sewage and waste water treatment.

Figure 3. Reasons for not achieving good in 2015 (% for acidification is included in other SWMI categories)



### Physical modifications – affecting 25% of water bodies

These are modifications that society has made and continues to make to rivers, lakes, estuaries and our coastline; the end result being that the size and shape of natural habitats become altered. Physical modifications can include artificially straightening channels to aid navigation or flood risk management, structures designed to reduce flood risk, flow regulation structures to create reservoirs, dams and weirs, or short-term management activities like dredging or vegetation removal.

Physical modifications can cause changes to the natural flow, water levels and can result in the excessive build-up of sediment and the loss of habitat that wildlife needs to survive. Many of our towns and cities have been built around the water environment and we need to find sustainable solutions to ensure these issues do not have a negative impact on the water environment, economy, health and wellbeing. Some historic modifications may have been present for many years, and may serve multiple purposes providing benefits to society. Where these physical modifications lead to a failure of environmental objectives, practical and reasonable mitigation measures are required. The aim of these mitigation measures are to enhance and restore the quality of the existing environment.

As our population grows and the effects of climate change increases, the pressure to physically modify water bodies in the future is likely to increase as we protect ourselves

and our homes from increased risk of flooding and droughts. The approach to new modifications is to ensure that they do not adversely impact the water environment. These modifications need to be undertaken in an environmentally sensitive way within the constraints of technical feasibility and costs and help improve our resilience to other pressures including climate change, recreation and fishing. Naturalising and restoring our waters will help to improve habitats and fish passage throughout the catchments; this may include using natural water retention measures such as wetland creation or coastal realignment. Addressing these impacts can also have benefits for Protected Areas, in particular Natura 2000 sites.

### **Pollution from sewage and waste water – affecting 16% of water bodies**

Sewage and waste water can contain large amounts of nutrients (such as phosphorus and nitrates), ammonia, metals and other damaging substances including viruses and bacteria. These can have a detrimental effect on habitats and a significant impact on our use of water, particularly the recreational use of bathing waters and waters supporting shellfish for consumption. All groundwater in this RBD forms part of a Drinking Water Protected Area (DWPA). Unregulated discharges to ground and leaking subsurface sewers can cause point source and diffuse pollution of groundwater resources.

Pollutants enter the water environment through discharges from sewage treatment works, sewage overflows (either treated or untreated) and privately owned septic tanks and treatment plants. During periods of wet weather, storm overflows also contribute to the impact. This can affect the water environment and in particular bathing and shellfish waters. Changes in weather patterns and population distribution, alongside the need for new housing and other premises all contribute to pressure on the infrastructure in place to deal with our sewage and waste water. With ageing networks and future development this can overload works, increase the number of spills from overflows and have an impact on our environment. Consequently one of the key Programme of Measures continues to be those actions taken to tackle these issues. The overall Dŵr Cymru/ Welsh Water investment programme for 2015-20 is £1.5 billion, this includes their maintenance spend, supply demand balance and funding for all requirements listed in the National Environment Programme (NEP) (Phase 4) issued in 2013. For NEP Phase 5 water quality improvement schemes the total capital costs are £55.9m.

Improving effluent treatment and regulating unlawful discharges from privately owned septic tanks will have a significant positive affect on the water environment. This will ensure our drinking water supply is protected from the harmful effects of pollution, provide clean water for food production, and provide opportunities for the public to continue to enjoy the outdoors through recreation including fishing which is particularly popular in this RBD. There are also benefits to our habitats and a large number of Protected Areas including bathing waters, shellfish waters, Natura 2000 sites and sensitive areas under the Urban Waste Water Treatment Directive can be better protected. It also contributes toward achieving objectives in the estuarine and coastal environment under the Marine Strategy Framework Directive. It will also be important to tackle sewerage misconnections and to increase public awareness to prevent misuse of the sewerage system and avoid the disposal of harmful chemicals, fats, oils and greases.

### **Pollution from towns, cities and transport – affecting 12% of water bodies**

A combination of misconnections of our dirty water (from sewage and washing) at our workplaces (in particular industrial estates) and homes together with rainwater collected

from manmade surfaces such as building roofs, roads and pavements collectively contribute to a mixture of water pollution within our towns and cities. This can include dust/grit, oils, detergents, metals, road salt, bacteria from animal faeces and other particulates which becomes collected through surface water drainage systems or directly into local streams and lake from localised drains. This can have an impact on our rivers, lakes, groundwater, estuaries and coastal waters. In some instances pollutants from historically contaminated land and atmospheric pollution contributes to the problem in surface waters and groundwater.

Tackling this is complex due to the nature and number of small discharges that collectively have a locally significant impact, for example locating the source of pollution from a large industrial estate which may have many different types of businesses from vehicle repair to graphic design and printing, with each business handling different materials and having different infrastructure. This has been recognised by the Welsh Governments Water Strategy and Natural Resources Wales' Diffuse Pollution Plan both of which are included in the Programme of Measures to protect and improve our waters. We also have an opportunity to minimise impacts from historic and future developments through better urban design and planning.

### **Pollution from rural areas – affecting 20% of water bodies**

Some land management practices by the agriculture and forestry sectors and impacts from other rural uses (for horses/ stables and golf courses) can result in nutrients (such as phosphorus and nitrate), bacteria, pesticides, soils and sediments affecting the water environment. Nutrients can cause excessive algal growth and lead to eutrophication in our surface waters. Groundwater used for drinking water can also be impacted through the long term application of nitrate fertilizers where this can result in nitrate concentrations above the drinking water standard. Groundwater containing elevated levels of nutrients can lead to poor ecological status in wetlands that are groundwater fed.

The loss of soil as a basic resource through some land management practices can mean even more fertilizers are used exacerbating the issue. Agriculture and forestry practices can also contribute to sedimentation of our surface waters and can contribute to soil compaction. This, together with artificial rural drainage systems, can increase surface water run off during periods of wet weather leading to increased flooding.

Preventing and reducing pollution from rural areas will benefit the water environment, both for people and wildlife. From a commercial perspective, land owners can save money through good land management practices, preventing loss of soil and nutrients, the water industry can make significant savings if there is less need to prioritise investment in the treatment of drinking water for colour, pesticides and nitrate contamination. Approaches such as general binding rules could assist in tackling diffuse agricultural pollution issues. Locally people benefit through better water quality in our rivers, lakes, groundwater, estuaries and coastal waters especially in areas designated for bathing or shellfish harvesting. There are also benefits to our habitats and a large number of Protected Areas including bathing water, shellfish waters, Drinking Water Protected Areas, Natura 2000 sites and nutrient sensitive areas designated as nitrate vulnerable zones.

There is a need to promote tree planting, new woodland creation and woodland management measures that are consistent with “Woodland for Water: Woodland measures for meeting Water Framework Directive objectives” 2011.

### **Invasive Non-Native Species – (INNS was not a reason for not achieving good in 2015 in water bodies in the Western Wales RBD)**

The presence of invasive non-native plants and animals in our watercourses poses a threat to biodiversity, increases flood risk, affects the condition of our water environment and has a significant economic impact through the costs of managing invasions and preventing further spread and maintaining flood defences. Signal crayfish are widespread and affect animals such as fish and invertebrates. Other species such as mitten crabs can destroy reed beds and intertidal habitats and can cause banks to collapse by burrowing into them. This affects all water body categories, including estuaries and coastal waters. Climate change is thought to drive certain species northwards, increasing their frequency and variety in the future and affecting the condition of water bodies.

Non-native invasive species can have significant economic impacts, once they are established control is often prohibitively expensive or technically infeasible and ultimately unsuccessful. The cost of controlling invasive species to make sure that flood defences, navigation and the natural environment are not compromised is rising. Some plants such as floating pennywort and creeping water primrose increase the risk of flooding. Others like signal crayfish can decrease river bank stability and most have negative impacts on ecology and leisure activities such as angling and water sports. There are also significant costs in controlling and safely disposing of invasive species such as Japanese knotweed on development sites and managing species such as zebra mussels, which can block pipes, intakes and other structures.

The most effective and least expensive measure is to reduce the number of new species introduced and slow the spread of those that are already present by applying good biosecurity (measures which reduce the risk of spreading diseases and invasive non-native plants and animals) and promoting the 'Check, Clean Dry' and 'Be Plantwise' campaigns.

Natura 2000 Protected Areas can be vulnerable to certain invasive non-native species. Intensive and often expensive control measures may be required to actively manage or eradicate them in specific circumstances. For example, at sites designated for their habitat interest, Himalayan balsam can dominate and reduce the habitat space available for native plant species. Controlling the Himalayan balsam by targeted and intensive hand pulling or cutting over a number of years can reduce the pressure from this species and prevent further deterioration of the habitat. Within Marine Natura 2000 sites the slipper limpet has the potential to smother protected habitat features reducing their biodiversity and affecting their condition. Careful biosecurity will reduce the risk of this happening however control measures such as dredging and smothering can also be used to remove the species should it be found.

### **Pollution from mines – affecting 23% of water bodies**

Contaminated groundwater can discharge from abandoned mines and is a major problem in Wales. These mine water discharges are often contaminated with dissolved metals such as iron, lead, copper, zinc and cadmium which discharge into adjacent rivers and subsequently to estuarine and coastal waters. Rain water run-off from spoil heaps associated with the workings can also discharge into rivers. These metal rich discharges have a significant detrimental impact on many of our rivers and the fish and ecosystems they support.

Abandoned metal mines are responsible for the majority of this type of pollution although discharges from former coal mines also cause significant, but more localised river pollution. Many groundwater and surface water bodies fail to achieve good status as a result of the discharges from abandoned mines and some estuarine and coastal waters can also be impacted in catchments that have a significant legacy issue.

Dealing with pollution from mine waters will substantially improve water quality and help wildlife, including fish, insects and other aquatic life. It will also protect valuable drinking water supplies. There are wider benefits from mine water remediation for example using wetland reed beds significantly enhances biodiversity and provides a rich habitat for birds. These are often visually attractive and can be used as public amenities. Abandoned mine sites are part of Wales's industrial heritage with many being designated as Scheduled Monuments or Sites of Special Scientific Interest. It is an exciting area of academic research particularly in Wales where cost effective, sustainable remediation options are being researched.

The Coal Authority currently operates 70 treatment schemes at abandoned coal mines using funding from the Department of Energy and Climate Change (DECC) across England, Wales and Scotland. 15 are in Wales, 12 in the Western Wales RBD and 3 in the Severn. These schemes must continue to operate to prevent deterioration in rivers and groundwater. Since 1994, the Coal Authority has cleaned up and protected over 240 km of rivers, protected drinking water supply groundwater, and each year stops over 3,000 tonnes of iron and other contaminants causing pollution.

### **Acidification – % of water bodies is included in other SWMI categories**

Acidification of rivers and lakes due to the atmospheric deposition of sulphur and nitrogen compounds continues to impact our upland water bodies. The source of this pollution is industry and transport and there have been international controls on acidic emissions resulting in great reductions. However, the response of acidified waters has been slow, and, in some cases, full biological recovery is expected to take many more years.

Air emissions reductions should continue to be the primary response to the issue of acid deposition. However, there are opportunities to promote the recovery process through land management changes.

In some locations the atmospheric pollutants are captured by tree canopies, which can lead to the exacerbation of acidification compared to shorter types of vegetation. It is therefore important to manage forestry within vulnerable areas to ensure acidification is not exacerbated and opportunities for improvement are realised. There are guidelines in place (from 2014) as part of the UK Forestry Standard to ensure this happens.

## **2.4 Delivery of actions**

Actions taken during the first cycle have collectively contributed to the protection and improvement of the water environment. The actions related to all types of water bodies: rivers, lakes, canals, wetland, groundwater, estuaries and coastal waters including those in Protected Areas. A summary is set out below of the Programme of Measures which were set out to achieve the statutory objectives, including existing mechanisms, statutory and voluntary actions. Further detail is included in the **Progress Report**. A summary of the updated Programme of Measures for 2015-2021 is set out in Section 3 together with further detail provided in **Water Watch Wales**.

## **Preventing deterioration**

All measures and many of the day to day activities of Natural Resources Wales and many of our partners contribute to preventing deterioration of the water environment. Through our collective knowledge we are able to identify which water bodies are specifically at risk of deterioration and set out the measures, where possible, to prevent or mitigate those risks.

## **The Programme of Measures**

The 2009 RBMP included measures, across sectors and all water body types. This was the first programme of statutory measures specifically developed to meet the requirements of the WFD. They include actions to prevent deterioration and improvements in water body status.

Data for the first cycle shows that 81% of measures in the first plan have been completed in the Western Wales RBD. . Further detail is included in the **Progress Report**.

## **Investigations**

Since the 2009 plans were published, Natural Resources Wales has carried out an extensive investigations programme in the Western Wales RBD to find out why many water bodies are not in good condition. This has included over 600 investigations not including those to ensure 'no deterioration'. Our knowledge and understanding of the issues affecting water bodies has increased significantly. As a result, we are now in a better position to work with our partners to identify where the greatest environmental improvements can be made, which will provide the most benefit to everyone. Our investigations confirmed that the main reasons why water bodies are not in a good condition relate to issues such as, physical modifications and diffuse pollution from rural areas.

## **Additional new measures**

The Programme of Measures requires regular review to ensure the right actions are being delivered in the right place. During the first cycle new priorities and/or opportunities meant that some actions were reviewed to reflect the current need of the environment. This included applying existing measures in new places and partnership funding (e.g. Welsh Government and Dŵr Cymru/Welsh Water funds). Further information on additional new measures in the first cycle are included in the **Progress Report**.

## **Alternative objectives**

In some instances there are known reasons as to why water bodies could not achieve good status by 2015. For the first cycle there were 517 water bodies that fell into this category where an alternative objective was set to meet good status by 2027. Many (485 water bodies) of these were included as the cause of the adverse effect was unknown. Investigations carried out during the first cycle have increased our understanding. Details of the alternative objectives for the next six years are set out in Section 4

## **2.5 Deterioration**

One of the main objectives of the WFD is to prevent deterioration of a water body from the 2009 baseline. Where there is shown to be a deterioration in status from 2009 to 2015 these the reasons for this must be assessed and explained.

Some deterioration may not actually mean that the quality of the environment is worse, it is just that we have monitored elements in that water body in the first cycle which were not previously monitored. It is important that all the relevant data is reviewed to determine what actions need to be taken where and in some cases no follow up action will be required.

To assess compliance with the WFD objective of preventing deterioration, the 2015 classifications results (based on data up to the end of 2014 and the same standards and classification tools used in 2009), were compared with the 2009 classification baseline. The assessment considered whether the water body had deteriorated from one status class in 2009 to a lower one in 2015. This was applied to a water body's overall status and to the status of each element used in classification. Confidence has been measured in terms of certainty. Natural Resources Wales have included those sites where we are 'quite certain' to 'highly certain' that the element has failed thus causing the water body to fail. The results of this assessment are summarised in Table 5.

Table 5: Water bodies that have deteriorated (at >75% confidence)

Water bodies	Number of water bodies	% of water bodies
Surface water ecological status	17	2%
Surface water chemical status	9	1%
Groundwater quantitative status	0	0%
Groundwater chemical status	0	0%

The reasons for the deteriorations are summarised in Section 4.2 of the **Progress Report**. In total 29 elements deteriorated over 28 water bodies.

## 2.6 Progress in achieving first cycle objectives

The collective actions set out above have been reviewed. From this we can update the statutory Programme of Measures and investigations to ensure that the updated RBMPs are effective tools for protecting and improving our water environment. Table 7 shows a summary of the progress towards good or better status between 2009 and 2015. Data from the 2015 classification (which includes data up to the end of 2014) has been compared with the same standards and classification tools used in 2009.

Table 6. Comparison of 2009 baseline with 2015 predicted and actual results

Percentage. of water bodies at good or better status	2009	2015 predicted	2015 actual
Surface water ecological status	29%	36%	39%
Surface water chemical status	6%	6%	17%*
Groundwater quantitative status	96%	96%	100%

Groundwater chemical status	64%	64%	48%
<b>Overall status</b>	<b>30%</b>	<b>36%</b>	<b>38%</b>

\*This figure reflects an increased number of water bodies monitored for chemical status

In 2009 30% of water bodies in the Western Wales RBD achieved good or better status. We predicted that this would rise to 36% for surface waters by 2015. This was supplemented by an internal target of achieving 50% good or better status across Wales. The 2015 classification results indicate that 38% of all water bodies now achieved good or better status. In addition during this period 426 water body elements<sup>1</sup> improved by one or more class.

Improvement in status is limited by the current understanding of pressures on the water environment, their sources, the action required to tackle them together with the resources to deliver the programme (both people and budget).

Some of this change reflects the number of sites monitored by the WFD monitoring programme. Since 2009, to fill gaps in our understanding, we have increased our monitoring to better understand the pressures on the water environment, especially in some estuarine and coastal water bodies. For example, in 2009 across Wales we monitored seven lakes for macrophytes, in 2015 that increased to 41, of which 23 met the required standard. Therefore much of the change in the data indicates a better understanding of the pressures affecting the environment rather than an actual change in quality. Apparent deterioration will continue to be investigated to understand if it is due to a real change in quality of the environment or the reasons explained above. Further detail on these outcomes is included in the **Progress Report**.

## 2.7 Review of first cycle progress

Having reviewed the outcomes over the last six years the lessons learnt have been applied to the updated plans, these are set out in the **Progress Report**.

The updated 2015 plan enables us to put in place a more robust Programme of Measures learning from progress made over the last six years. This Programme of Measures are set out in Section 3 and the objectives that we aim to achieve as a consequence of this programme are set out in Section 4. Progress towards these objectives will be monitored and reviewed as set out in Section 1.7.

---

<sup>1</sup> Note 'Water body elements' includes ecological (biological, physio-chemical, other substances and specific pollutant elements excluding BOD and Dissolved Oxygen in canals) and chemical elements (Other Pollutants, Priority Substances and Priority Hazardous Substances) only in surface waters and quantitative and chemical (GW) elements only for groundwater bodies. Excludes supporting elements. Assessed elements only.

## 3. Programme of Measures

### 3.1 Overview of the Programme of Measures

The challenges that threaten current and future uses of the water environment are managed by collective actions which include statutory measures to maintain and enhance the water environment. This section summaries the main supplementary programmes and statutory measures to achieve the objectives within this plan, the objectives are set out in Section 4.0. Measures range in type from those that are statutory legal requirements or economic incentives, to others that are voluntary codes of good practice or locally negotiated agreements. All measures will be tracked and progress reported in line with agreed WFD reporting requirements (Section 1.6).

Measures are divided into two groups. National measures apply to the whole of Wales, or the United Kingdom. In general these set the legislative, policy or strategic approaches and in many instances use existing mechanisms. Examples include a national ban on using a particular chemical or a national strategy for prioritising and funding the remediation of abandoned mines. Local measures are specific to the RBD or a part of it. For example, the removal of invasive plants along a length of designated river or a local campaign targeting misconceptions across an industrial estate. Many of the actions listed will also have multiple benefits. For example, sustainable drainage systems can help to reduce diffuse pollution, reduce surface run-off and flood risk, and deliver biodiversity and green infrastructure benefits.

The national measures are grouped into their significant water management issues which are discussed in Section 2.3 and an overview of the local measures is included. A list of all national measures, and the local measures are available on **Water Watch Wales**.

### 3.2 Delivery programmes

The Programme of Measures and environmental outcomes they aim to achieve will be delivered through a number of existing programmes. The following sections describe the main programmes.

- **Natural Resources Wales programme**

Natural Resources Wales is committed to delivering WFD objectives through an integrated approach to natural resources and catchment management across its functions:

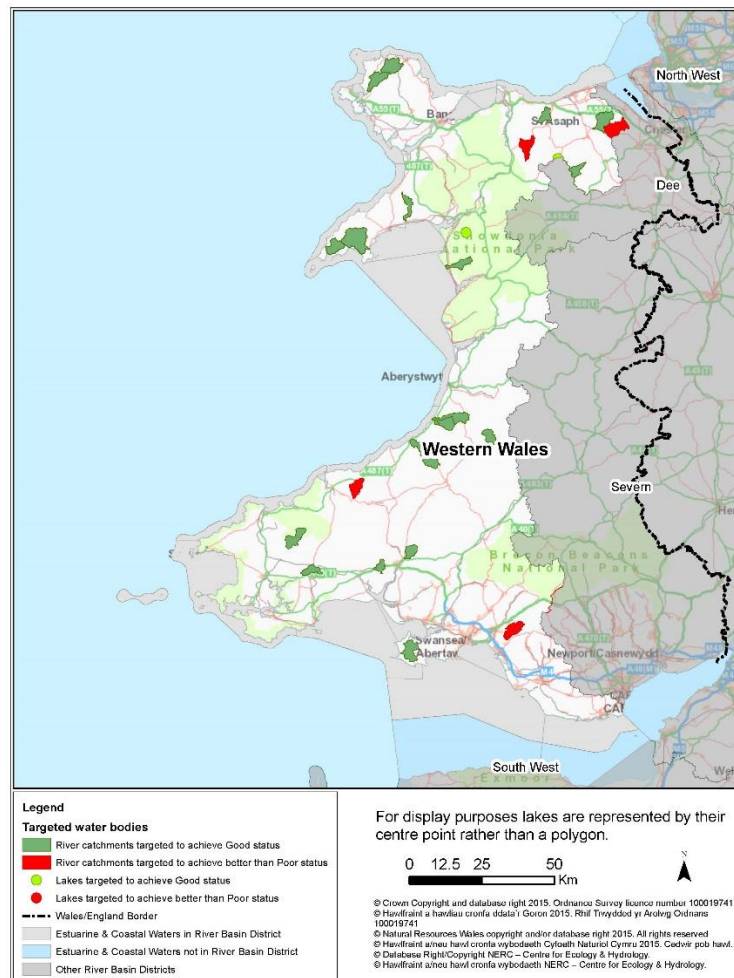
#### **WFD**

We have worked across Natural Resources Wales to develop an affordable programme of local and national measures, based upon our current understanding of existing resources. Our focus is:

- Preventing deterioration in all water bodies
- Improving compliance with good overall status in 21 water bodies that are currently moderate/poor, and also improving 4 poor water bodies to moderate. These are shown on Figure 4 below.
- Targeting measures locally in an integrated way to deliver environmental improvements in WFD water bodies and Protected Areas, including areas protected for water habitats and species.

- Identifying where element level improvements will be achieved during the second cycle, but where further measures will be required to deliver an overall ecological status change.
- Developing our approach to natural resource management by working at a local catchment level and capturing the wider benefits delivered through WFD.

Figure 4. Water bodies predicted to achieve good status or improve from poor status by 2021



## Natura 2000

A fundamental and new approach to capturing the prioritised, costed measures for water dependent Natura 2000 sites in Wales is through the development and publication of Prioritised Improvement Plans (PIPs), to contribute to maintenance and restoration of favourable condition.

During 2015, we have integrated evidence and information from the LIFE Natura 2000 Programme and RBMPs, in order that the updated RBMPs are based on our most current evidence base. We have worked across Natural Resources Wales to develop an affordable programme of local and national measures, based upon our current understanding of existing resources. This is available on **Water Watch Wales**. We will review this programme and envisage it will develop as opportunities/resources become available.

## **Flood and coastal risk management**

Natural Resources Wales' Flood and Coastal Erosion Risk Management capital investment programme aims to reduce the risks of flooding to people's homes and the economy, via improvements and maintenance to flood defence schemes and improving the understanding of flood risk through mapping and modelling. Most projects will focus on protecting people and avoiding other economic damages. Many may also contribute towards improving the status of water bodies, protecting valuable wildlife sites and creating new habitats.

Flood and coastal erosion risk management is a legitimate use of many water bodies but has in some cases resulted in significant modification to the shape and size of water bodies and led to alterations to their natural flows. Historic activities to improve water body conveyance and reduce flood risk, such as construction and reinforcement of banks, channel re-sectioning and vegetation management often had a negative impact on the condition of water bodies.

The capital investment programme aims to reduce the impact of these activities by working with natural processes and, where possible, using natural flood management measures to slow, store and filter floodwater. This will achieve more sustainable flood risk management schemes, often with significant additional environmental and social benefits. This approach is used together with traditionally constructed hard defences to increase the resilience of communities to extreme events, both floods and drought.

In identifying and designing schemes, the impacts of climate change, such as more winter rainfall, more intense rainstorms and sea level rise are taken into account.

Meeting statutory obligations, improving the natural environment and mitigating climate change will be achieved through 'win-wins' at the same time as reducing flood and coastal erosion risk (for example, through natural flood management where appropriate). Achieving environmental outcomes is integral to flood and coastal risk management, for example, where possible when improving defences opportunities to reduce any barriers to eel passage will also be sought.

The flood risk management investment programme is expected to deliver additional environmental outcomes for 2021 such as habitat improvement or creation through capital maintenance and flood defence expenditure. Improvements to the environment arising from the capital investment programme are not linked to predicted improvements in status by 2021 for specific elements in specific water bodies due to insufficient confidence about the scale of improvement or exact location of investment, additionally flood risk funding in Wales is predominantly set on an annualised basis hence future years plans are often indicative and dependant on funding.

## **Woodland and forestry**

Natural Resources Wales are committed to improving the environmental quality of Welsh Government's Woodland Estate (WGWE). We are addressing WFD failures by implementing the UK Forest and Water Guidelines 5th edition (UKFWG) published in November 2011. Well maintained culverts, effective silt traps, roadside drains separate from any natural watercourses, riparian zones and appropriate water management within the forest are essential for maintaining good ecological status across the WGWE. Pollution safeguards are in place when forest operations are carried out.

We have identified water bodies predicted to achieve good where we will:

- Review the forest riparian management and drainage systems and ensure they meet the UKFWG standards by 2021
- Prepare forest resource plans and identify potential risks, such as civil engineering, clear-felling and restocking and implement ways to mitigate them, considering Low Impact Silvicultural Systems (LISS) where applicable.
- Where unavoidable forest operations, such as felling to comply with a plant health order, could have a significant water quality impact we will take all steps to mitigate them.

During 2015 we are updating our WFD evidence base as part of the RBMPs. This information will inform our programme of water bodies predicted to achieve good.

- **Welsh Government**

The Water Strategy for Wales was launched by the Minister for Natural Resources on 19th May 2015. The vision is to ensure that Wales continues to have a thriving water environment which is sustainably managed to support healthy communities, flourishing businesses and the environment. The strategy sets out the direction for water policy over the next 20 years in the context of the Environment (Wales) Bill and Well-being of Future Generations (Wales) Act 2015.

The strategy is accompanied by an action plan with milestones up to 2025 (and beyond). There are six policy priorities for 2015-18:

- supporting the development of the area based approach to natural resource management.
- ensuring access to fair and affordable water and sewerage services.
- devolution of all matters relating to water and sewerage and the removal of the unilateral power of the UK Government to intervene in respect of water resources in Wales.
- a more focused approach to sewerage and drainage management and development and implementation of legislation to support sustainable drainage solutions.
- reform of the abstraction licence system in Wales to ensure sustainable management of our water resources now and in the future.
- review and where appropriate change current practices and regulatory approaches to tackle diffuse pollution.

- **Water industry investment programme**

Ofwat, the economic regulator of the water companies reviews water industry investment, plans every five years. As part of this process, known as the price review, Natural Resources Wales works with water companies, Ofwat and others to make sure that investment protects and improves the water environment, increases resilience and secures long-term benefits for society and the economy. Natural Resources Wales set out the environmental obligations, including work required to prevent deterioration and achieve Protected Area and water body status objectives.

The overall Dŵr Cymru/ Welsh Water investment programme for 2015-20 is £1.5 billion, this includes their maintenance spend, supply demand balance and funding for all

requirements listed in the National Environment Programme (NEP) (Phase 4) issued in 2013. For NEP Phase 5 water quality improvement schemes the total capital costs are £55.9m.

Significant investment will go into addressing point source impacts from sewage treatment works and discharges from the sewer network. This will reduce pollutants such as ammonia and nutrients that disturb the natural ecological balance of water bodies and cause excessive growth of vegetation and algae.

Habitat improvement schemes are planned to reduce the impact of physical modifications caused by water company operations and action is planned to deal with invasive non-native species on water company land. Further measures will ensure compliance with the Eels Regulations, which require water intakes to be screened to prevent eels from being drawn out of the river into drinking water treatment works.

Climate change adaptation and mitigation is an integral part of water company planning and is an essential part of assessing scheme options. This is particularly important for water resources planning, where water companies must plan up to 25 years in advance to make sure that there is enough water to meet future demands.

Most of the measures are well-established engineering solutions that are proven to be effective. Changes are secured through amendments to environmental permits.

There are some catchment and habitat improvement schemes that are less well established, including measures to reduce pesticide pollution. Some of these schemes rely on voluntary behavioural change affecting agricultural practice. These can be less effective when compared to engineering solutions.

Water company investment will directly contribute to predicted improvements in status by 2021 for specific elements in specific water bodies. We will include measures where there is a proven link shown by data (and supported by modelling), between a water company's activity and a failure to meet required standards. This will include installing phosphate-stripping equipment at sewage treatment works. Measures are also being carried out to ensure that the receiving environment does not deteriorate due to development resulting in increased discharges from wastewater treatment works.

A wide range of measures will secure additional outcomes for the environment, but are not linked to specific improvements in element status by 2021 because there is insufficient confidence about the scale of improvement. This includes measures for eel passage, measures to protect drinking waters and improve bathing waters and measures to improve river habitat and flow regime where it is affected by impoundment for public water supply.

We plan to publish the water company programme on **Water Watch Wales**.

- **Rural land management**

Glastir is the Welsh Government's sustainable land management scheme comprising of the basic-level Entry, the higher-level Advanced, Commons and Organic. It also includes the restoration, creation and management of woodlands. They are entirely voluntary schemes and form a large part of a wider investment in Wales under the Welsh Government's Rural Communities – Rural Development Plan 2014 to 2020. The objectives of Glastir are to bring about beneficial environmental outcomes by:

- managing soils to help conserve carbon stocks and reduce soil erosion;
- improving water quality and reducing surface run-off;

- managing water to help reduce flood risks;
- conserving and enhancing wildlife and biodiversity;
- managing and protecting landscapes and the historic environment;
- creating new opportunities to improve access and understanding of the countryside

Glastir supports the implementation of measures over and above legal requirements, cross compliance and usual farming practice.

Glastir Advanced supports environmental work targeted at specific locations that are best placed to deliver the aims of the scheme. Expressions of Interest for a Glastir Advanced contract, submitted by applicants, are scored on the ability of that particular holding to deliver against the objectives the Welsh Government is seeking to address. This is identified by measuring the intersection of the area of land included in the Expression of Interest with a series of Geographical Information System (GIS) layers, wherever they occur throughout Wales. These GIS layers inform where specific objectives of Glastir can best be delivered. The specific objectives are prioritised within each GIS layer, but the relative importance of each layer can be adjusted, by using weighting factors, to ensure the greatest priorities are addressed first.

For water quality, the relevant GIS layer identifies those areas where Natural Resources Wales was confident in its evidence that land management practices are contributing factors to failing water quality standards defined under the WFD.

Within these priority areas, Glastir Advanced is used to address soil management and ways to reduce the effect of nutrient, sediment and faecal bacteria pollution through the provision of water management plans for each holding. The plans are also used to assist the delivery of the most appropriate management options and capital works so as to gain the best outcome for water quality priorities through Glastir.

To date, Glastir Advanced has 11,000 ha of targeted management to deliver beneficial outcomes for water quality objectives across the whole of Wales.

Glastir Woodlands is underpinned by a management plan, drawn up in line with the UK Forestry Standard, which is the reference standard for sustainable forest management in the UK. The sustainable management and restoration of forested and wooded land, along with the creation of well-designed new woodlands and forests, is essential to ensure the supply of good-quality fresh water, provide protection from natural hazards such as flooding or soil erosion and to protect the needs of aquatic species.

- **Water resources sustainability measures**

Abstraction and other changes to river flows and groundwater levels are putting pressure on the water environment, and, in some cases, are causing environmental damage. Dealing with abstraction and flow pressures now will address damage that is already occurring and also help support sustainable supplies of water for the future.

Measures grouped within this programme are based on applying existing provisions under the Water Resources Act 1991. Current tools will be fully used to achieve environmental objectives ahead of Welsh Government's plans for reform of the abstraction licensing system in Wales, which will create a system that has built in long-term flexibility to help deal with future challenges of changing climate, population and economic growth whilst protecting the environment and trying to ensure water is used efficiently. Following public

consultation Government also plan to bring some exempt abstractions into the licensing system. This will give greater ability to control the environment and prevent damage.

Most measures will be applied through the current abstraction licensing system and involve the following types of action:

- constraint or refusal of applications to renew time limited licences
- changes or revocation of licences necessary to protect from serious damage - Natural Resources Wales are using government guidance and evidence to take a prioritised approach to assessing whether licence changes are needed to protect from serious damage to the environment. All abstractors should anticipate changes to their abstraction licences in water bodies affected by serious damage.
- working with licence holders to voluntarily apply to change licences to make them sustainable
- implementing the Restoring Sustainable Abstraction programme, through which Natural Resources Wales will take action to amend or revoke abstraction licences that have already been identified as causing an environmental problem.
- revoking unused licences

The existing abstraction licence charges schemes fund these measures. (Note water company actions are included in the section titled “Water company investment programme”).

Licence change measures are well established and proven to result in environmental benefits once the change becomes effective, and will achieve environmental outcomes. Changes in abstraction quantities and timing will have a quick effect on some water bodies. Surface water bodies suffering from serious damage will see flows increased, and the damage being caused will be stopped. However, for licence changes made to groundwater abstractions, benefits may take longer to take effect, and can be over many years. This is particularly true when considering groundwater recovery times within some major aquifers.

Climate change will affect the future demand for water as well as its availability and quality. Rivers and groundwater water bodies are already under pressure. Demand for water is increasing due to population growth, urban development and land-use change. Climate change is expected to alter the frequency and distribution of rainfall, increasing temperatures and increasing the frequency and severity of extreme weather events. Dealing with unsustainable abstraction and implementing water efficiency measures is essential to prepare and be able to adapt to climate change and increased water demand in future.

Not all of the measures can be linked to predicted outcomes in specific water bodies by 2021 because there is insufficient confidence in the exact scale and timing of improvement. However, classification change may be seen in some, as yet unspecified, water bodies.

- **Catchment level funded improvement in Wales**

In Wales, Natural Resources Wales has made available £4.2 million for 2015-2018 to fund projects that benefit the wildlife, people and economy of Wales. The Competitive Fund is based around the aim of Natural Resource Management, namely, to sustainably manage our natural resources in a way and at a rate that can maintain and enhance the resilience of our ecosystems whilst meeting the needs of present generations without compromising

the ability of future generations to meet their needs. There will be a focus on the Natura 2000 network of designated sites in Wales (Special Areas of Conservation and Special Protection Areas). This is to help achieve Wales' legal obligations under the European Birds Directive and Habitats Directive (Aim A). At the same time, it seeks to integrate this conservation work with other social and economic benefits highlighted as important in Natural Resources Wales's Corporate Plan.

This has provided funding to partners across Wales. In the Western Wales RBD this includes work to restore rivers, improve in-river and riparian habitat, tackle non-native invasive species, development of novel nutrient offsetting approaches to support sustainable industry and land management, and provide education and community engagement.

Natural Resources Wales also manages projects partially funded by others, such as the European Union and Big Lottery Fund (BIG). For example the LIFE Natura 2000 Programme for Wales was a project to develop Prioritised Improvement Plans (PIPs) which sets out prioritised, costed actions for every Natura 2000 site in Wales with the aim of restoring these prime wildlife sites and safeguarding them for the future.

The Welsh Governments' Nature Fund of £5 Million is supporting 20 projects that through collaborative action tackle declining biodiversity and deliver benefits to communities across Wales by the end of 2015. The focus of investment is on delivering 5 key priorities in 7 Nature Action Zones. The 5 key activities are:

- action to improve river catchments
- action on marine ecosystems
- action for local environment
- action to realise the potential in our upland areas
- action to stimulate innovation

For the Western Wales RBD the relevant Nature Action Zones are Conwy Valley, Cambrian Mountains, Llyn Peninsula, Pembrokeshire Coast, South Wales Valleys, Berwyns and Migneint. Projects range from work to improve the farmed landscape in river catchments, pond creation and peatlands restoration, to providing information promoting low impact fishing practices and a community project managing woodland.

Other partners such as the Wales Biodiversity Partnership (WBP) also bring together key players from the public, private and voluntary sectors to promote and monitor biodiversity and ecosystem action in Wales. The work of WBP is actioned through the wider partnership and the support team.

- **Wider measures**

There are a number of measures which do not align with a single SWMI.

Theme	Measure
Investigations	The programme of investigations for waterbodies where there are; <ul style="list-style-type: none"> <li>• Known failures including those water bodies with alternative objectives</li> <li>• Risk of deterioration</li> </ul>
Flood Risk Management	Measures delivered under RBMPs should consider how to maximise benefits to Flood Risk Management. For example, advice to land owners on the management of surface water should include how to reduce or slow down run-off as well as pollution prevention advice.
Climate Change	River basin management planning is a long-term process and addressing climate change risk needs to be incorporated throughout. European Common Implementation Strategy guidance on 'river basin management in a changing climate' guides member states to integrate climate change adaptation into each of the steps of river basin management planning, in particular in the assessment of pressures and selection of measures.
Natural flow and levels of water	Welsh Government to review the abstraction licensing system to inform future policy in relation to water resource management
Natural flow and levels of water	Bring currently exempt water abstractions within licence (New Authorisations)
Natural flow and levels of water	Investigations to assess the environmental impacts of impoundments and possible mitigation measures
Natural flow and levels of water	Prioritise solutions to tackle water body failures due to abstraction

Theme	Measure
Natural flow and levels of water	In line with the Welsh Government's Water Strategy for Wales, seek ways to reduce waste and improve water efficiency
Natural flow and levels of water	Contribute to maintenance of, or restoration to, favourable conservation status on Natura 2000 Protected Areas through undertaking review of consents
Natural flow and levels of water	DCWW customers special offer on water butts (subject to funding) to encourage recycling of rainwater for garden watering and therefore help to reduce demand during dry periods
Natural flow and levels of water	Target land management measures through Glastir agri-environment scheme and Section 15 agreements to mitigate diffuse pollution from agriculture and reduce impact of drainage to enhance biodiversity and achieve favourable conservation status.
Natural flow and levels of water	Revise Glastir to better support and prioritise Natura 2000 wetlands/peatlands conservation management and water level management.
Natural flow and levels of water	Complete actions to address abstraction licences identified in the Review of Consents process as having an adverse impact on site integrity.
Natural flow and levels of water	Support the delivery of the Welsh Government National Peatland Restoration Programme.
Drinking Water Protected Areas - surface water and groundwater	At risk DrWPAs (and all upstream water bodies) have been taken forward as 'candidate' Safeguard Zones for funded Asset Management Plan (AMP) Investigations to assess the sources of the raw water failure and to identify viable catchment solutions. Where catchment solutions are found to be possible, and stakeholder agreement can be assured, Safeguard Zones will be formally established for funded improvement measures.
Economically significant species (Shellfish Waters)	A range of measures are planned to endeavour to achieve the microbial standard in shellfish flesh as summarised in section 3.3. Plans are in place to deliver a better understanding of improvements required to achieve Shellfish Water Protected Area objectives and information to support cost benefits

Theme	Measure
	analysis. This will lead to updated plans to propose measures to achieve compliance with relevant objectives.
Recreational Waters (Bathing Waters)	Bathing Water profiles have been produced for all designated sites. They include details of the measures needed to achieve compliance with the revised standards that came into force in 2015.
Nutrient Sensitive Areas (Urban Waste Water Treatment Directive)	Measures have been identified to ensure that all relevant discharges from waste water treatment plants within the sensitive area have appropriate phosphorus or nitrogen emission standards.
Nutrient Sensitive Areas (Nitrate Vulnerable Zones)	Nitrate Vulnerable Zones have been designated and can be designated in areas where water quality is affected by nitrates from agricultural sources. Measures to reduce nitrate concentrations within NVZs include establishing a voluntary code of good agricultural practice and developing action programmes to reduce agricultural nitrate losses.
Natura 2000: Water dependent Special Areas of Conservation (SACs) and Special Protection Areas for Wild Birds (SPAs)	As part of the LIFE Natura 2000 Programme for Wales Natural Resources Wales developed Prioritised Improvement Plans (PIPs) for all Natura 2000 sites that are not currently in favourable condition (including water dependant sites/features). Thematic Action Plans have also been developed as part of the programme to address key strategic issues to Natura 2000 sites. Some of the measures from both PIPs and the Thematic Plans will take place during this cycle and will contribute to achieving objectives under the WFD.
Freshwater Special Areas of Conservation Common Standards Monitoring Guidance	In collaboration with other UK Agencies, we are updating existing guidance to ensure that this is based on the latest evidence base and improve consistency.
Natura 2000: Water dependent Special Areas of Conservation (SACs) and Special Protection Areas for Wild Birds (SPAs)	Natural Resources Wales is reviewing its Core Management Plans for Natura 2000 sites to ensure that the targets reflect the latest knowledge.

### 3.3 Summary programme of national measures for significant water management issues

Section 2.3 summarised the most important issues we believe that threaten the current and potential future uses of the water environment. These have been grouped into significant water management issues for the planned Programme of Measures which are set out below however, there are significant relationships between the groups which will act to address particular pressures collectively. This is particularly relevant for estuarine, coastal and marine waters where nutrients and chemicals are the most significant pressures that require to be addressed. All measures in the terrestrial and freshwater environment that will lead to a reduction in nutrients and chemicals discharges, will lead to a reduction of those pressures in estuarine, coastal and marine waters. Furthermore, measures to reduce pollution from urban areas, rural areas, mines and sewage and waste water in combination with legislative measures taken for individual (e.g. tributyltin) or groups (e.g. Persistent Organic Pollutants) of chemicals will lead to a reduction in specific pollutants and priority substances to meet relevant objectives.

These are the significant statutory actions to ensure protection and improvement of the water environment across the RBD. A list of national and local measures are included on **Water Watch Wales**.

#### 3.3.1 Physical Modifications

##### Who needs to be involved

Welsh Government, Defra, Natural Resources Wales, Owners of the barriers to fish passage and coastal and flood defences, Local Authorities, NGOs – through partnerships and campaigns, River Restoration Centre, Wales Biodiversity Partnership, UK Technical Advisory Group (UKTAG).

##### By 2021

- Where modifications to the water environment are essential to society, for example navigation, public water supply, coastal defence or flood management, we want to mitigate harmful impacts as far as possible.
- We want to provide more coastal habitat by managed realignment to compensate for the impact of coastal squeeze.
- We want to ensure future modifications do not cause deterioration.
- We want to increase the extent of buffer zones and river side corridors alongside inland waters in order to make them more resilient to other pressures, including climate change.

Description	Who leads
Continue to implement the Hydropower guidelines including the production of a design and siting guide for developers of hydropower schemes	Natural Resources Wales
Deliver our statutory duties to maintain, improve and develop salmon, trout, freshwater and eel fisheries	Natural Resources Wales

Description	Who leads
Give strategic direction for fisheries work in Wales as set out in The Agenda For Change for Fisheries	Natural Resources Wales
Deliver the sustainable fisheries programme in Wales to secure improvements to fish habitat and migration	Natural Resources Wales
Revise Clearing the Waters guidance for dredging and disposal activities in coastal and estuarine waters	Natural Resources Wales
Identify opportunities to improve the water environment through existing programmes of work and scheme designs for Flood Risk Management	Natural Resources Wales
Natural Resources Wales will seek opportunities and influence others to utilise natural flood risk management measures where appropriate.	Natural Resources Wales
Promote managed realignment and intertidal habitat creation through the National Habitat Creation Programme (NHCP).	Welsh Government, Natural Resources Wales
In water bodies designated as heavily modified due to flood and coastal protection, mitigation for Natural Resources Wales owned assets and activities will be reviewed and delivered on a prioritised basis.	Natural Resources Wales
Contribute to the delivery of priority Water Level Management Plans.	Natural Resources Wales
Contribute to research and development to identify best practice for managing hydromorphological pressures in the water environment.	Natural Resources Wales
Across Wales review of the impacts of unregulated activities targeting sea fisheries resources. This should consider the extent of activities, impacts of extractions and associated activities (e.g. access) on European Marine Site (EMS) features, and the recoverability of EMS features.	Natural Resources Wales

### 3.3.2 Managing pollution from sewage and waste water

#### Who needs to be involved

Welsh Government, Natural Resources Wales, Water Industry, Local Authorities, Shellfish Industry, General public.

## By 2021

- All sewerage systems are maintained and, where necessary, improved so they operate effectively and their impacts on the water environment, from catchment to coast are minimised.
- Solutions to combined sewage overflow problems that deliver multiple benefits are embedded in planning and development across Wales (e.g. water sensitive urban design, sustainable drainage schemes).
- Increase public awareness of the impacts of misconnections and disposal of harmful substances into sewerage systems (e.g. paint, oil, fats and garden chemicals).
- Maintain and improve Bathing and Shellfish Waters to promote a thriving tourism and shellfish aquaculture industry.

Description	Who leads
Natural Resources Wales have worked with water companies to develop a programme of investigations and improvements to sewage discharges in order to support delivery of WFD and Protected Area objectives in AMP6 (2015-20)	Natural Resources Wales, Water Industry
Work strategically with UK administrations to share best practice on preventing and resolving misconnections	Natural Resources Wales, Water Industry
National trials at sewage treatment works for removal of Phosphorus towards 0.1mg/l P to achieve WFD and Natura 2000 objectives	Water Industry
Welsh Government to develop a regulatory framework that encourages sustainable, innovative solutions to waste water management	Welsh Government
Water companies develop and deliver catchment management options that improve water quality and deliver additional ecosystem services	Water Industry
Raise awareness of correct installation and operation of private sewage treatment systems	Natural Resources Wales
Reducing disposal of fat, oil and grease to sewers – awareness campaign to influence behaviour with leaflets, information packs	Water Industry

Description	Who leads
Implement revised methodology for assessment of hazardous pollutants within surface water discharges	Natural Resources Wales, Water Industry
Promote the use of sustainable drainage systems (SuDS) and provide guidance for integrating development and water planning	Natural Resources Wales
Develop and deliver a more focused approach to sewerage and drainage management.	Welsh Government

### 3.3.3 Manage pollution from towns, cities and transport

#### Who needs to be involved

Welsh Government, Natural Resources Wales, Water Industry, Local Authorities, SuDs Approving Bodies, Industry, Manufacturing and other Business, NGOs through partnerships and campaigns, Maritime and Coastguard Agency relevant Authority Groups for European Marine sites, Ports and Harbours Sector, General public.

#### By 2021

- We want to minimise the negative impact of historic and future development on the water environment via our role as a land quality consultee in the planning process or, where the planning process is not applicable, by providing advice and assistance to local authorities with their contaminated land inspection strategy.
- We want to put the ecosystem approach at the centre of urban design and planning. By using sustainable drainage systems (SuDS), restoring the areas around rivers and coasts including the river banks, floodplain and the intertidal area, providing public green spaces, raising awareness and changing behaviour to improve the quality of life in the urban areas of Wales.

Description	Who leads
Welsh Government to introduce Fuel and Oil Regulations in Wales	Welsh Government
Natural Resources Wales working with Welsh Government and others to promote and embed the use of Water Sensitive Urban Design (WSUD) into planning policy and devolved building regulations	Welsh Government, Natural Resources Wales
The development of SuDS Approval Bodies to provide consistent advice for planning activities and maintenance of schemes	Welsh Government

Description	Who leads
Welsh Government to review legislative framework surrounding urban diffuse pollution	Welsh Government
Promote the implementation of SuDS (sustainable drainage systems) in new and existing developments, in both urban and rural areas to gain environmental, water quality, social and flood risk benefits	Natural Resources Wales
Influence planning authorities to require the use of SuDS and contribute to the implementation of appropriate SuDS technology.	Natural Resources Wales
Deliver priority actions set out in Natural Resources Wales' Diffuse Water Pollution Plan	Natural Resources Wales
Work in partnership to investigate misconceptions including the targeting of hotspots. Include outreach work to increase public and community awareness and engagement	Natural Resources Wales, Water Industry
Use UK Government's ePIMS (Electronic property information system) to identify publicly owned industrial estates and depots within failing WFD water-bodies and work with Welsh Government and Local Authorities to resolve issues such that these sites aim to achieve best practice	Natural Resources Wales, Welsh Government, Local Authorities
Assess the environmental impacts and reduce contamination from historic industrial and waste sites	Natural Resources Wales, Local Authorities
Use pollution incident data to target pollution prevention advice and activities.	Natural Resources Wales, Water Industry
Raise awareness of the benefits and successes of managing surface water run-off through SuDs (sustainable drainage systems) and rainwater harvesting in order to mitigate flooding and pollution.	Natural Resources Wales, Water Industry
Implementation of SuDS (sustainable drainage systems) Code of Practice. Comply with published advice for operators on sustainable drainage systems	Natural Resources Wales
Advise small and medium sized businesses on pollution prevention	Natural Resources Wales, Water Industry
Improve understanding of the origins and solutions to diffuse pollution by carrying out local investigations (e.g. Clear Streams)	Natural Resources Wales, Water Industry
Develop evidence base to support management of marine litter and marine litter strategy.	Natural Resources Wales & Welsh Government
Develop and implement legislation to support sustainable drainage solutions.	Welsh Government
We will publish interim national standards on an advisory basis until we commence Schedule 3 of the Flood and Water Management Act 2010.	Welsh Government

Description	Who leads
We will look at options to implement Schedule 3 of the Flood and Water Management Act 2010, which requires new developments to include SuDS features that comply with national standards.	Welsh Government
We will undertake a review of current drainage ownership and related legislation, with a particular emphasis on surface water and orphan assets and on drainage misconnections.	Welsh Government
We will support owners of private sewerage systems by working with Natural Resources Wales and other partners to provide guidance on septic tank maintenance. We will also engage with local authorities who have a duty to ensure that owners of private sewerage systems maintain them to prevent a threat to public or environmental health.	Welsh Government
We will consult on and implement revised guidance for sewerage schemes for rural communities under Section 101A of the Water Industry Act 1991 and consider legislating to simplify the process.	Welsh Government
Control the release of chemicals, to the water environment, at source i.e. production and use, through the implementation of European legislation, including the Registration, Evaluation, Authorisation & restriction of Chemicals Regulations (REACH), Persistent Organic Pollutants regulation and Sustainable Use of Pesticides Directive	Welsh Government, Health & Safety Executive, Natural Resources Wales

### 3.3.4 Manage pollution from rural areas

#### Who needs to be involved

Welsh Government, Natural Resources Wales, Water Industry, Industry, Manufacturing and other Business, Agriculture and rural land management, NGOs through partnerships and campaigns, Academia, Local Authorities, Relevant Authorities Groups for European Marine Sites, Wales Biodiversity Partnership, General public.

#### By 2021

- We want to strengthen regulatory, financial and operational mechanisms to support a sustainable agricultural sector that protects the water environment, from catchment to coast, and helps deliver the full range of ecosystem services that provide financial, social and ecological benefits to Wales.

- Appropriate new woodland creation and forestry management that benefits the water environment, people through outdoor recreation and delivers ecosystem services such as reduced diffuse pollution, reduced flood flows, clean drinking water, habitat for fish and wildlife, and shade in river margins to mitigate the impacts of climate change.
- Where necessary we will propose designation of further areas as Nitrate Vulnerable Zones in order to protect surface and groundwater quality.
- For those groundwater dependent wetlands that are in a poor ecological condition as a result of high nutrient groundwater inputs we will encourage local changes in catchment management to mitigate and if possible prevent.

Description	Who leads
Monitor, investigate and resolve the source of pollution in Drinking Water Protected Areas	Natural Resources Wales, Water Industry
Welsh Government to review legislative framework surrounding rural diffuse pollution	Welsh Government
Ensure the Rural Development Plan supports sustainable agricultural practices to achieve WFD and Protected Area objectives	Welsh Government, Natural Resources Wales
Natural Resources Wales work in partnership with key stakeholders (e.g. Farming and Forestry Connect, farming unions) to develop and deliver targeted advice and guidance to land managers	Agriculture and rural land management, Natural Resources Wales
Natural Resources Wales delivers a prioritised Programme of Measures on the Welsh Government Woodland Estate to support delivery of WFD and Protected Area objectives	Natural Resources Wales
Continue to improve awareness and implementation of the UK Forestry Standard Guidelines (including “Forests and Water” Guidelines), and Practice Guides, across the forest sector.	Natural Resources Wales
Welsh Government target Glastir Woodland Management incentives to deliver improvements to the water environment	Welsh Government
Welsh Government implement the Nitrates Directive as appropriate	Welsh Government
Deliver Water Awareness Events to staff and contractors who work on Welsh Government Woodland Estate (and in private forestry) to cover water management on operational sites.	Natural Resources Wales
Natural Resources Wales to promote relevant measures for tree planting, new woodland creation and woodland management measures that are consistent with ‘Woodland for Water: Woodland measures for meeting Water Framework Directive objectives’ 2011	Natural Resources Wales
Use the Small Business Research Initiative (SBRI) innovation programme to develop new solutions to environmental issues.	Natural Resources Wales

Description	Who leads
Review the implementation of Statutory Management Requirements (SMR) and Good Agricultural Environmental Condition (GAEC) to strengthen the drivers for best agricultural practice - ensure that there is parity in terms of the monitoring for and consequences of practices causing diffuse pollution (within the catchments of Natura 2000 sites) with SMR.	Welsh Government
Strengthen links between agri-environment options and Natura 2000 objectives on farms within catchments which are currently impacting on Natura 2000 sites	Welsh Government
Review and strengthen the effectiveness and enforcement of relevant legislation and policy (gap analysis) to improve its ability to deal with diffuse water pollution	Welsh Government
Investigation to identify where Natura 2000 sites downstream of forestry may benefit from improvements (i.e. riparian vegetation improvements, forest drain realignment and roadside drain disconnection from watercourses) to meet current UKFS standards (Forestry Standards), in order to minimise any risk of diffuse pollution and acidification.	Natural Resources Wales
Undertake a pilot investigation to identify sources of diffuse pollution within a Marine Natura 2000 site and recommend target actions to address the diffuse issues.	Natural Resources Wales
Align statutory duties under permitting and planning legislation to support a holistic approach to nitrogen deposition in Wales, integrating both air and water quality impacts and engage with external stakeholders to deliver a natural resources management approach.	Natural Resources Wales
Natural Resources Wales and our own Agricultural Advisory Services to work with landowners to develop a common understanding of diffuse pollution and how they can help to prevent it through improved land management.	Welsh Government
Encourage catchment scale community action through area statements developed by Natural Resources Wales and other co-operative groups aiming to improve water quality in their area.	Welsh Government

### 3.3.5 Managing invasive non-native species (INNS)

#### Who needs to be involved?

Dealing with INNS is a collective responsibility involving all sectors and land owners including Welsh Government, Natural Resources Wales, Industry, Manufacturing and other business including relevant retailers, Navigation, Agriculture and rural land management, NGOs through partnerships and campaigns, Academia, UKTAG, GB Non-Native Species Secretariat.

(GBNNSS), Welsh local records centres, Wales Biodiversity Partnership (Invasive Non-Native Group), General public.

## By 2021

- We want to prioritise actions to slow down or prevent the spread of existing species and eradicate these or new introductions where possible to do so.
- We also want to minimise the risk posed by INNS generally through improved biosecurity and improved local information on INNS distribution and impact.

Description	Who leads
Work with partners and support the development of new and innovative solutions, such as AquaWales and Aquainvade led by Swansea University to investigate early detection and eradication of freshwater INNS and aquaculture; and the Small Business Research Initiative innovation programme.	Natural Resources Wales
In-line with the regulation implemented by DEFRA for England under the Wildlife & Countryside Act, ban the sale of five invasive non-native aquatic plants in Wales: floating pennywort, floating water primroses, New Zealand pigmyweed, parrot's-feather, water fern	Welsh Government
Develop and promote adoption of codes of conduct and biosecurity initiatives, and raise awareness of impacts of INNS across marine, terrestrial and freshwater Natura 2000 habitats and species.	Welsh Government
Ensure that risks to Natura 2000 habitats and species posed by INNS are managed by integrating biosecurity best practice into appropriate regulatory regimes.	Natural Resources Wales
Support research into effective control and eradication methods for INNS (marine, terrestrial and freshwater) with significant impacts on Natura 2000.	Welsh Government

### 3.3.6 Managing pollution from mines

#### Who needs to be involved

Welsh Government, Coal Authority, Natural Resources Wales, Local Authorities, Landowners, NGOs through partnerships and campaigns, Academia.

#### Outcome by 2021

- We want to mitigate the impacts of abandoned mines on the water environment through a strategic work programme across Wales. It will take decades to address all the issues and we will prioritise actions that deliver the best ecological, social and economic outcomes for society's investment.

Description	Who leads
A programme to deliver appropriate treatment at a small number of high priority, high benefit metal mines identified under the Metal Mine Strategy for Wales	Natural Resources Wales, Coal Authority
Research programme to look at the remediation of spoil heaps (coal) using woodland and habitat creation	Natural Resources Wales
Coal Authority minewater preventative and remediation programme	The Coal Authority
Implementation of best practice controls and remediation at abandoned coal mines. DECC funded prioritised (phased) programme	The Coal Authority
Implementation of best practice controls and remediation at abandoned metal mines	Natural Resources Wales, Coal Authority
Continue to investigate minewater impact and develop remediation plans in accordance with the Metal Mines Strategy for Wales	Natural Resources Wales, Coal Authority
Investigate discharges from abandoned metal, and other non-coal mines in accordance with the Metal Mine Strategy for Wales. Prioritise for inclusion in national agreement with relevant mines partner organisations	Natural Resources Wales, Coal Authority

### 3.3.7 Manage the impacts of acidification

#### Who needs to be involved

Welsh Government, Natural Resources Wales, Industry, Manufacturing and other Business, Agriculture and rural land management, NGOs through partnerships and campaigns, Academia.

#### Outcome by 2021

- We want land use practices to contribute to sustainable, long term recovery to natural pH conditions in areas where ecological processes are compromised by acidification. We will continue to regulate emissions of acidifying pollutants to allow the water environment to recover.

Description	Who leads
Continue to improve awareness and implementation of the UK Forestry Standard Guidelines (including “Forests and Water” Guidelines), and Practice Guides (including “Managing forests in acid sensitive water catchments”), across the forest sector.	Natural Resources Wales
Natural Resources Wales delivers a prioritised Programme of Measures on the Welsh Government Woodland Estate to support delivery of WFD and Protected Area objectives	Natural Resources Wales

### 3.4 Summary programme of local measures

These measures encourage local action to protect and enhance the water environment. These allow some flexibility to target actions through working with partners with an interest in the water environment. A list of national and local measures are included on **Water Watch Wales**. As with national measures there are significant relationships between groups which will act to address particular pressures collectively.

#### General Local measures

- Actions to control or manage diffuse source inputs: reduce diffuse pollution at source:
  1. Natural Resource Management staff undertake agriculture site visits
  2. Soil management workshops
  3. Mapping of sewage sludge deployments
  4. Work on misconnections
- Actions to control or manage point sources: reduce point source pollution at source
  1. Targeted Water Quality inspections
  2. Combined sewer overflow (CSO) inspections
  3. Industrial estate pollution prevention
- Actions to improve regulated flows: Appropriate management of water releases
- Actions to improve modified habitat: Removal or easement of barriers to fish migration
- Actions to improve modified habitat: Improvement to condition of channel/bed and/or banks/shoreline

#### Specific Local measures

- Working in partnership with the Water Companies to look at the potential for phosphate removal (uncertainty in relation to cost benefits / some with no evidence ecological impact / suitability of small works). These water bodies are likely to require other actions to tackle other sources of both diffuse and point. Source pollution within the catchment.
- Working with Water Companies on actions identified from the AMP6 Event Duration Monitoring programme.
- Actions required for Protected Area drivers such as NVZs where actions are needed on sources of both point and diffuse source pollution.
- Actions to prevent deterioration. For example action on diffuse sources in rural water bodies that are borderline for phosphate failures.
- Actions to support partners in their work.
- Actions to improve modified habitats such as the removal or easement of barriers to fish migration in water bodies that do not necessarily fail for the fish element but require habitat restoration.
- Support Water Companies in their Drinking water Protected Area investigations (and potential requirement for follow up actions).

## 4. Environmental objectives and outcomes

The River Basin Management Planning process is about using our evidence base to develop a Programme of Measures and understanding what this means in terms of achieving WFD objectives within the planning timeframe. In line with the RBMP guidance we have set objectives and identified measures for every water body, the measures are set out in Section 3. This information can be accessed at **Water Watch Wales** and a more detailed description of our approach is provided in the **Annex**.

### 4.1 Water body objectives

For surface waters, objectives are set for ecological and chemical status. For artificial or heavily modified water bodies objectives are set for ecological potential and chemical status. For groundwater objectives are set for quantitative and chemical status.

Water body objectives consist of 2 pieces of information: the status (for example, good) and the date by which that status is planned to be achieved (for example, by 2021).

The WFD alternative objectives and defences can only be used in relation to the standards and objectives arising from the mechanisms of the WFD itself, not in relation to standards or objectives arising from other Community legislation. We have not sought to extend the deadline for any Protected Area objectives set under other European legislation and measure to prevent deterioration must proceed.

The default objective for all WFD elements is good by 2021. We have only applied extended deadlines or less stringent objectives (alternative objectives) to failing elements, where we have robust evidence that it is not realistic to set an objective of good by 2021. We have set objectives at the element level and then aggregated them to produce an ecological, chemical and overall objective for each water body. Therefore, a water body may have more than one justification for not achieving good by 2021.

We have extended the deadline to achieving good by 2027 in the following cases:

- **Technically infeasible - cause of adverse impact unknown.** Further investigation is required during second cycle.
- **Ecological recovery time** - measures are in place but natural ecological recovery will take longer to occur than 2021. This has only been applied where we believe measures to address acidification are in place.

We have set an objective of less than good by 2027 (less stringent objective) in the following cases, shown in Table 7:

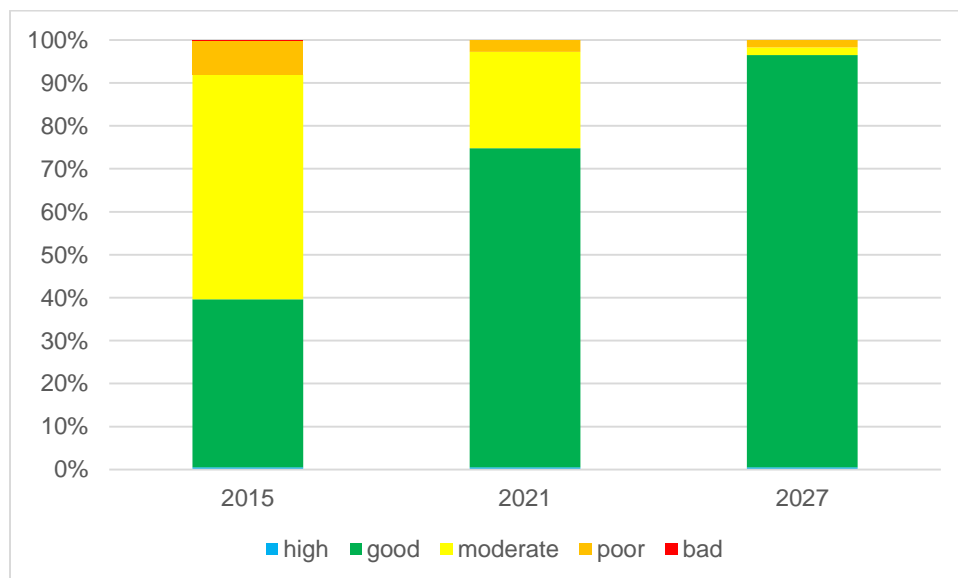
- **Background (natural) conditions** – it is our expert judgement that classification tools have set the wrong baseline for the water body due to naturally higher background concentrations.
- **Technically infeasible - no known technical solution is available.** This has only been applied to ground water bodies which fail because of legacy metal mine contamination.
- **Disproportionately costly – unfavourable balance of costs and benefits.** Costs significantly exceed benefits (greater than 2:1). A small number of sites were identified through a screening process and consulted on in the draft updated RBMP.

Table 7. Summary of justifications of alternative objectives. A water body may have more than one justification.

Justifications	Number of water bodies
Technically infeasible - cause of adverse impact unknown.	95
Ecological recovery time	39
Background conditions	9
Technically infeasible - no known technical solution is available.	9
Disproportionately costly – unfavourable balance of costs and benefits.	2

There are 143 water bodies (25%) for which we are proposing an alternative objective (i.e. other than good by 2021). Figure 5 shows current overall status in 2015 and the outcomes by 2021 and 2027 if all feasible and cost-beneficial measures are put in place. In 2015, 225 waterbodies which is equivalent to 40% are in good or better overall status. 425 water bodies which is equivalent to 74% have an objective of good status or better to be achieved by 2021 however, there is a large degree of uncertainty that such a significant increase in achieving good status or better will be observed by 2021 as outlined in section 4.1. In Wales we plan to improve compliance with good status by delivering measures locally in an integrated way to achieve environmental improvements in WFD water bodies and Protected Areas. This will include targeting an improvement to good status in 21 water bodies (equivalent to 4%) in WFD compliance by 2021.

Figure 5. Percentage overall water body status and objectives for 2015, 2021 and 2027.



### Outcomes and uncertainty

There is a large degree of uncertainty in terms of delivering the required measures and environmental improvements by 2021. The main factors are:

- uptake of voluntary measures, in particular when working with multiple land managers across a catchment.
- available funding and resources beyond 2015/16. Uncertainty increases as we project forward.

- understanding of ecological recovery. We have a limited understanding of how and when the ecology will respond following delivery of measures.

We believe that we can maximise our outcomes by developing our approach integrated natural resources management and working at the local catchment level.

We are already working with strategic and local partners, in particular the voluntary sectors, to deliver improvements (e.g. Water Industry programme, Coal Authority and eNGOs such as the Wildlife Trusts and Afonydd Cymru) and looking for opportunities to ‘join up’ actions to deliver benefits to the environment, economy and society of Wales. We have provided local information on planned and resourced measures on **Water Watch Wales** in order to help facilitate partnership work. We plan to review delivery programmes with partners in order to refine and align co-delivery.

#### 4.2 Protected Area compliance and objectives

Protected areas are a priority for action to ensure they achieve their objectives and protect the benefits that they provide. The extent to which protected areas are compliant with their current standards and objectives is summarised below;

##### Drinking Water Protected Areas

The objectives for drinking water protected areas are to ensure that:

- under the water treatment regime applied, the drinking water produced meets the standards of the Drinking Water Directive plus any Wales specific requirements to make sure that drinking water is safe to drink
- the necessary protection to prevent deterioration in the water quality in the protected area in order to ensure that existing purification treatment does not have to be significantly increased in future

Drinking water protected areas are at risk when increases in pollution caused by human activity could lead to more water treatment being needed in future and where additional measures are needed to reduce pollution. In the Western Wales RBD there are 52 surface water and 25 groundwater drinking water Protected Areas. All of Wales is regarded as a drinking water protected area for groundwater purposes. Safeguard zones have been identified for any ‘at risk’ abstractions and measures are targeted within them; there is only one safeguard zone in Wales for a public groundwater abstraction in the Western Wales RBD. Table 8 summarises those at risk (surface water) and at poor status (groundwater)

Table 8 Drinking water protected areas current status and at risk

Water body type	Number of drinking water protected areas	% at risk (surface water)/% at poor status (groundwater)
Surface water	52	79%
Groundwater	25	0%

##### Economically significant species (shellfish waters)

Some areas of estuarine and coastal waters are designated as shellfish waters. Shellfish waters are areas requiring protection or improvement to support shellfish life and growth in

order to contribute to the high quality of shellfish for people to eat. Since 2013 the requirements for Shellfish Water Protected Areas (SWPAs) has transferred to the Water Framework Directive. Natural Resources Wales has put in place a wide range of measures to endeavour to achieve the Guideline microbial standard in flesh in the 21 SWPAs in this river basin. This has resulted in statistically significant improvements in E.Coli concentrations in Shellfish Flesh in the Menai Strait East and Burry Inlet North which contains approximately 80% of the value of the Shellfish Industry in Wales. In 2014, the Guideline standard was achieved in 14% of SWPAs. Highest compliance with Guideline was achieved in 2013 at 33% of SWPAs in Wales however, no SWPAs have complied with the Guideline microbial standard for more than 8 out of the last 10 years. There is a significant amount more understanding of the behaviour of microbial pathogens in the estuarine and coastal environment and interactions with Shellfish required before we can be confident of achieving and maintaining the microbial standard. The 3 Shellfish Water Protected Areas which were compliant with the microbial standard in 2014 have an objective of Guideline in 2021. All other Shellfish Water Protected Areas in Western Wales (18) have an extended deadline to 2027 to meet their objective on the basis of technical feasibility. Table 9 summarises the shellfish water protected area objectives.

Table 9. Shellfish water protected areas objectives

Number of shellfish waters	Objective	Current status 2015 (achieving compliance)	Achieving objective by 2021	Achieving objective by 2027
21	Endeavour to achieve the shellfish flesh guideline standard	0	3	18

### Recreational waters (bathing waters)

Bathing waters are designated waters and beaches that large numbers of bathers use. The objective for bathing waters is to preserve, protect and improve the quality of the environment and to protect human health by meeting the 'sufficient' water quality standards of the Bathing Waters Directive and to take such realistic and proportionate measures considered appropriate with a view to increasing the number of bathing waters classified as 'excellent' or 'good'. A revised Bathing Water Directive introduced new water quality objectives for bathing water protected areas from 2015. 2015 is the first year of the new Directive that imposes tighter standards on bathing water quality classifications aimed at achieving higher standards than the past Directive. In the Western Wales RBD there are 102 bathing waters. Table 10 summarises the bathing water Protected Areas current status with regard to the revised Directive standards.

Table 10. Bathing water protected areas objectives

Number of bathing waters	Objective	Number which met at least the sufficient classification in 2014*	Number we expect to achieve at least sufficient in 2015	Number at risk of not achieving sufficient in 2015
102	At least sufficient classification	102	102	0

\* This is the number that would have met at least the sufficient class if the new 2015 standards had been in force

Classifications against the revised Bathing Waters Directive standards have been calculated using the 2012-2015 data. Of the 102 designated bathing waters all 102 (100%) met at least the Sufficient standard, 97 (95.1%) were at least Good and 79 (77.45%) achieved the toughest of the new standards, Excellent.

### Nutrient sensitive areas (Nitrate Vulnerable Zones)

The objective of the Nitrates Directive is to reduce water pollution caused by nitrates from agricultural sources and to prevent further such pollution occurring. Nitrate Vulnerable Zones (NVZs) are designated where nitrate concentrations in water bodies are high or increasing, or water bodies are, or may become, eutrophic due to agricultural nitrate pollution. Farmers within NVZs must comply with mandatory action programme measures to reduce agricultural nitrate losses. In addition, a code of good agricultural practice has been established for voluntary implementation by all farmers. 2% of the Western Wales RBD is designated as NVZ and Table 11 gives figures for the reason for designation.

Table 11. Nitrate vulnerable zone protected areas extent

Reason for designation	Number of NVZs	Land area (ha) covered by NVZ type	% of RBD covered by NVZ type
High nitrate in surface water	1	4,391	26%
High nitrate in groundwater	5	13,019	77%
Eutrophication in lakes or reservoirs	2	3,557	21%
Eutrophication in estuaries or coastal waters	0	-	0%

### Nutrient sensitive areas (Urban Waste Water Treatment Directive)

The objective of the Urban Waste Water Treatment Directive is to protect the environment from the adverse effects of waste water discharges. Sensitive areas are designated for water bodies affected by eutrophication or where surface water abstraction is affected by elevated nitrate concentrations. Reductions or emission standards for nutrients in sewage effluent must be met within areas sensitive to nutrient pollution. Table 12 summarises these.

Table 12. Urban Waste Water Treatment Directive protected areas type and extent

Reason for designation	Number of sensitive areas	Length (Km) /Area(Km <sup>2</sup> ) designated
Eutrophication in rivers	2	38
Eutrophication in canals	N/A	N/A
Eutrophication in lakes or reservoirs	N/A	N/A
Eutrophication in estuaries or coastal waters	2	2.38
High nitrate in surface fresh water	N/A	N/A

### Natura 2000 sites: Water dependant Special Areas of Conservation or Special Protection Areas

The overall objective of the Habitats Directive is to maintain or restore, at favourable conservation status, natural habitats and species of wild fauna and flora of community importance. The network of protected areas established under the Wild Birds and Habitats Directives is known as Natura 2000. Meeting site conservation objectives will ensure that the integrity of the Natura 2000 site is maintained or restored as appropriate and ensures that the site contributes to achieving the ‘favourable conservation status’ of its qualifying features.

The provisions of the WFD only relate to water dependent Natura 2000 sites or water dependent habitats and species on sites that combine wet and dry features. The objective is to protect and, where necessary, improve the water environment to achieve the conservation objectives for the water dependent features of the site.

Table 13 gives the Natura 2000 water protected areas objectives in the Western Wales RBD. It should be noted that the boundary of some of the Natura 2000 sites cross more than one RBD. In these cases the relevant site has been considered in each RBD where the boundaries overlap. The default objective for all N2K sites is favourable condition by 2021. An extended deadline has only been proposed where we have robust evidence that 2021 is not achievable. There are two circumstances where this is the case:

1. Ecological recovery time. A number of sites are still impacted by historical acid deposition. Measures to reduce emissions have been implemented and there is UK and local evidence of recovery. However we do not think objectives will be achieved by 2021.
2. Technically infeasible. A number of sites are impacted by the presence of invasive non-native species (INNS) (e.g. American signal crayfish, Himalayan balsam). In most of these cases it is technically infeasible to eradicate the INNS by 2021.

Table 13. Natura 2000 water protected areas objectives

Objective	Number of protected areas		
	By 2015	By 2021	By 2027
Achieve conservation objectives	0	67	14

### 4.3 Outcomes for 2021

For the next six years the focus in Wales will be on;

- Preventing deterioration in all water bodies to the new tighter standards for some elements.
- Improving compliance with good status by targeting measures locally in an integrated way to deliver environmental improvements in WFD water bodies and Protected Areas. This will involve targeting 21 water bodies predicted to achieve good across Wales to deliver a 4% improvement in WFD compliance.
- Improving some of our worst performing water bodies by aiming to improve the overall status of by one class for 4 water bodies.
- Identifying where element level improvements will be achieved, but where further measures will be required to deliver an overall ecological status change. This will enable us to measure progress towards achieving good status and will lead to important benefits for the environment and improve ecological resilience.
- Developing our approach to natural resource management by working at a local catchment level and capturing the wider benefits delivered through WFD. Water is a valuable natural resource and WFD is a key tool in delivering natural resource management. We will also make the most of opportunities provided by the requirements of the Well-being of Future Generations (Wales) Act 2015, the Planning (Wales) Act 2015 and Environment (Wales) Bill to help us deliver objectives.
- We are already working with partners to deliver improvements (e.g. Water Industry programme, Coal Authority and eNGOs) and looking for opportunities to 'join up' local actions to maximise benefits to the environment, economy and society of Wales.

#### 4.4 Economic appraisal

For the consultation on the updated RBMPs we carried out a high level assessment of the costs and benefits of delivering WFD objectives under four scenarios.

Where we have identified the reason for failure and the measures that are required to achieve good overall status by 2021 we have applied indicative costs for those measures. Where more accurate costs are available (for example water company schemes) we have used this information.

To calculate benefits we have used monetised values (£ per km or km<sup>2</sup>) for different standards (i.e. Good, Moderate, Poor, Bad) of water body based upon the National Water Environment Benefit Survey (NWEBS). The net value of improvement between standards has been calculated and multiplied by the length of water body or area.

Following the consultation we have developed a better understanding of the costs of some Natura 2000 actions.

Further details can be found in the **Annex**.

## 5. Third Cycle Planning - Planning ahead and the challenges for 2021 – 2027

If we are to achieve the aspirations and objectives of the WFD work will need to begin on some of the more challenging solutions to improve the water environment. In some cases it will take many years to both identify and implement cost effective solutions and release the environmental benefits of the actions that are taken. It is also recognised that in some instances we already know the solutions and have the tools but we need the application of these through a planned programme with appropriate resources (people and money). During this cycle the aim will be to set out the steps required to deliver additional improvement. In some instances there may be opportunity to bring forward these improvements rather than wait until the next six year review in 2021, or at a minimum ensure the correct steps are in place to deliver these improvements by 2027 to meet the overall aspirations of WFD within three complete planning cycles from 2009 to 2027. Wherever possible we will bring forward improvements to meet the objectives of the WFD, the natural resources management approach set out in Section 1.6 will be key to achieve these additional wider outcomes for people and wildlife.

The environment is under constant pressure from change and this needs to be recognised as part of the river basin planning process, this may include the effects of;

- Changes in government policy
- WFD Risk Assessments forecasts to 2027
- Climate Change
- Population growth and distribution
- New major infrastructure projects
- Our productive capacity
- Changing demand on our natural resources
- Invasive non-native species
- New chemical pollutant concerns
- New evidence, emerging science and research

Published by:  
Natural Resources Wales  
Cambria House  
29 Newport Road  
Cardiff  
CF24 0TP

0300 065 3000 (Mon-Fri, 8am - 6pm)

[enquiries@naturalresourceswales.gov.uk](mailto:enquiries@naturalresourceswales.gov.uk)  
[www.naturalresourceswales.gov.uk](http://www.naturalresourceswales.gov.uk)

© Natural Resources Wales

All rights reserved. This document may be reproduced with prior permission of  
Natural Resources Wales