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# Water for life and livelihoods

## River Basin Management Plan Western Wales River Basin District



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Our website holds the River Basin Management Plans for England and Wales, and a range of other information about the environment, river basin management planning and the Water Framework Directive. [www.environment-agency.gov.uk/wfd](http://www.environment-agency.gov.uk/wfd)

You can search maps for information related to this plan by using 'What's In Your Backyard'. <http://www.environment-agency.gov.uk/maps>.

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Front cover image taken by Andy Schofield, Environment Agency Wales

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## This plan at a glance

This plan is about the pressures facing the water environment in the Western Wales River Basin District, and the actions that will address them. It has been prepared under the Water Framework Directive, and is the first of a series of six-year planning cycles.

**By 2015, 13 per cent of surface waters (rivers, lakes, estuaries and coastal waters) in this river basin district are going to improve for at least one biological, chemical or physical element**, measured as part of an assessment of good status according to the Water Framework Directive. This includes an improvement of **900 km** of the river network in the river basin district, in relation to fish, phosphate, specific pollutants and other elements.

**36 per cent of surface waters will be at good or better ecological status/potential and 60 per cent of groundwater bodies will be at good status by 2015.** In combination 36 per cent of all water bodies will be at good status by 2015. The Environment Agency wants to go further and achieve an additional two per cent improvement to surface waters across England and Wales by 2015.

The biological parts of how the water environment is assessed – the plant and animal communities – are key indicators. **At least 59 per cent of assessed surface waters will be at good or better biological status by 2015.**

In the past there has been considerable progress in protecting the natural assets of the Western Wales River Basin District and cleaning up many of the problems of the water environment. The mountainous areas such as Snowdonia National Park and the rich coastal environment from the Menai Strait in the north to Pembrokeshire in the west and the South West Valleys create a well known landscape. Their wildlife is supported by water, which is vital for the livelihoods of those who live and work here.

However, a range of challenges remain, which will need to be addressed to secure the predicted improvements. They include;

- diffuse pollution from agricultural and other rural activities;
- diffuse pollution from historical mines;
- physical modification of water bodies;
- point source pollution from water industry sewage works;
- acidification.

At present, because of these pressures and the higher environmental standards required by the Water Framework Directive, only 29 per cent of surface waters are currently classified as good or better ecological status/potential. 51 per cent of assessed surface water bodies are at good biological status now.

In order to meet these targets, it is important for everyone to play their part now and in the future. River basin management is an opportunity for this generation – for people and organisations to work together to improve the quality of every aspect of the water environment – to create an environment we are all proud of and can enjoy.

# 1 About this plan

This plan focuses on the protection, improvement and sustainable use of the water environment. Many organisations and individuals help to protect and improve the water environment for the benefit of people and wildlife. River basin management is the approach the Environment Agency is using to ensure our combined efforts achieve the improvement needed in the Western Wales River Basin District.

River basin management is a continuous process of planning and delivery. The Water Framework Directive introduces a formal series of 6 year cycles. The first cycle will end in 2015 when, following further planning and consultation, this plan will be updated and reissued.

The Western Wales River Basin District Liaison Panel has been central to helping us manage this process. The panel includes representatives of businesses, agriculture and forestry, planning authorities, environmental organisations, consumers, navigation, fishing and recreation bodies and central, regional and local government, all with key roles to play in implementing this plan. The Environment Agency has also worked extensively with local stakeholders to identify the actions needed to address the main pressures on the water environment.

This plan has been prepared under the Water Framework Directive, which requires all countries throughout the European Union to manage the water environment to consistent standards. Each country has to:

- prevent deterioration in the status of aquatic ecosystems, protect them and improve the ecological condition of waters;
- aim to achieve at least good status for all water bodies by 2015. Where this is not possible and subject to the criteria set out in the Directive, aim to achieve good status by 2021 or 2027;
- meet the requirements of Water Framework Directive Protected Areas;
- promote sustainable use of water as a natural resource;
- conserve habitats and species that depend directly on water;
- progressively reduce or phase out the release of individual pollutants or groups of pollutants that present a significant threat to the aquatic environment;
- progressively reduce the pollution of groundwater and prevent or limit the entry of pollutants;
- contribute to mitigating the effects of floods and droughts.

The plan describes the river basin district, and the pressures that the water environment faces. It shows what this means for the current state of the water environment, and what actions will be taken to address the pressures. It sets out what improvements are possible by 2015 and how the actions will make a difference to the local environment – the catchments, the estuaries and coasts, and the groundwater.

Looking towards implementation, the plan highlights the programme of investigations to be undertaken. This will identify more actions, particularly those associated with diffuse pollution, for delivery during the first cycle. New national measures, made available by government, will also lead to additional improvements. At local level, the Environment Agency will be working closely with a wide variety of organisations and individuals, not only to deliver the commitments contained in the plan, but wherever possible to expand upon them for the benefit of the water environment.

## **Strategic Environmental Assessment**

A Strategic Environmental Assessment of the draft plan was completed to review the effects of the proposals on the wider environment. The assessment enabled us to make sure that this plan represents the most sustainable way of managing the water environment.

The Post Adoption Statement and accompanying Statement of Environmental Particulars is available at [www.environment-agency.gov.uk/wfd](http://www.environment-agency.gov.uk/wfd).

## **Habitats Regulations Assessment**

A Habitats Regulations Assessment of this plan has been carried out to consider whether it is likely to have a significant effect on any Natura 2000 sites. The assessment was undertaken by the Environment Agency, in consultation with the Countryside Council for Wales.

The assessment concluded that the River Basin Management Plan is unlikely to have any significant negative effects on any Natura 2000 sites. The Plan itself does not require further assessment under the Habitats Regulations. This conclusion is reliant on the fact that before any measures in the plan are implemented they must be subject to the requirements of the Habitats Regulations. Any plans, project or permissions required to implement the measures must undergo an appropriate assessment if they are likely to have a significant effect.

A copy of the Habitats Regulations Assessment of this plan is available at [www.environment-agency.gov.uk/wfd](http://www.environment-agency.gov.uk/wfd).

## **Impact Assessment**

An impact assessment of this plan has been completed. It looks at the costs of a reference case, which includes existing actions and new actions required by existing obligations, and the incremental costs and benefits of implementing the additional new actions required by this plan. The impact assessment also provides a forward look to the costs and benefits of potential action in future cycles (2015 to 2027 and 2021 to 2017).

A copy of the impact assessment is available at [www.environment-agency.gov.uk/wfd](http://www.environment-agency.gov.uk/wfd).

## 2 About the Western Wales River Basin District

The Western Wales River Basin District covers an area of 16,653 square kilometres and over 1.3 million people live within it. It extends across the entire western half of Wales from the Vale of Glamorgan in the South, to Denbighshire in the North. It is predominantly rural in nature; the main centres of population are restricted to the coastal strip and the westernmost of the South Wales valleys. The principal urban centres are Swansea, Bridgend and Neath in the south, Aberystwyth in the centre on the coast and Bangor in the North. Whilst primarily rural with agriculture and forestry as the dominant land uses, Western Wales is also home to many businesses. Thriving marine, oil and gas industries are critical economic activities, along with heavy industry such as the steel works at Port Talbot, coal mining and commercial fisheries. The district includes the island of Anglesey off the North-West coast of Wales. Figure 1 shows the river basin district.

The population within the river basin district has grown by around 0.2 per cent per annum between 1995 and 2002 and is forecast to continue to grow at this rate to 2015. The district receives a large number of summer visitors which substantially increases the population over the peak summer holiday weeks.

The lakes and rivers of the district are renowned for their game and coarse fishing. Salmon, brown trout and sea trout are present in many of the rivers, and bring in significant revenue to the district through fishing-related tourism. The coastal waters offer a diverse range of sea fishing both recreational and commercial. The coast of the Western Wales River Basin District contains hugely important environmental and economic assets. In addition some 70 per cent of the district's coastline is designated (under European Union Directives and UK law) for its environmental quality.

There are large and valuable cockle beds at Traeth Lavan in the North, and the Three Rivers and Bury Inlet in the South. Mussels are harvested from natural beds in the Conwy and

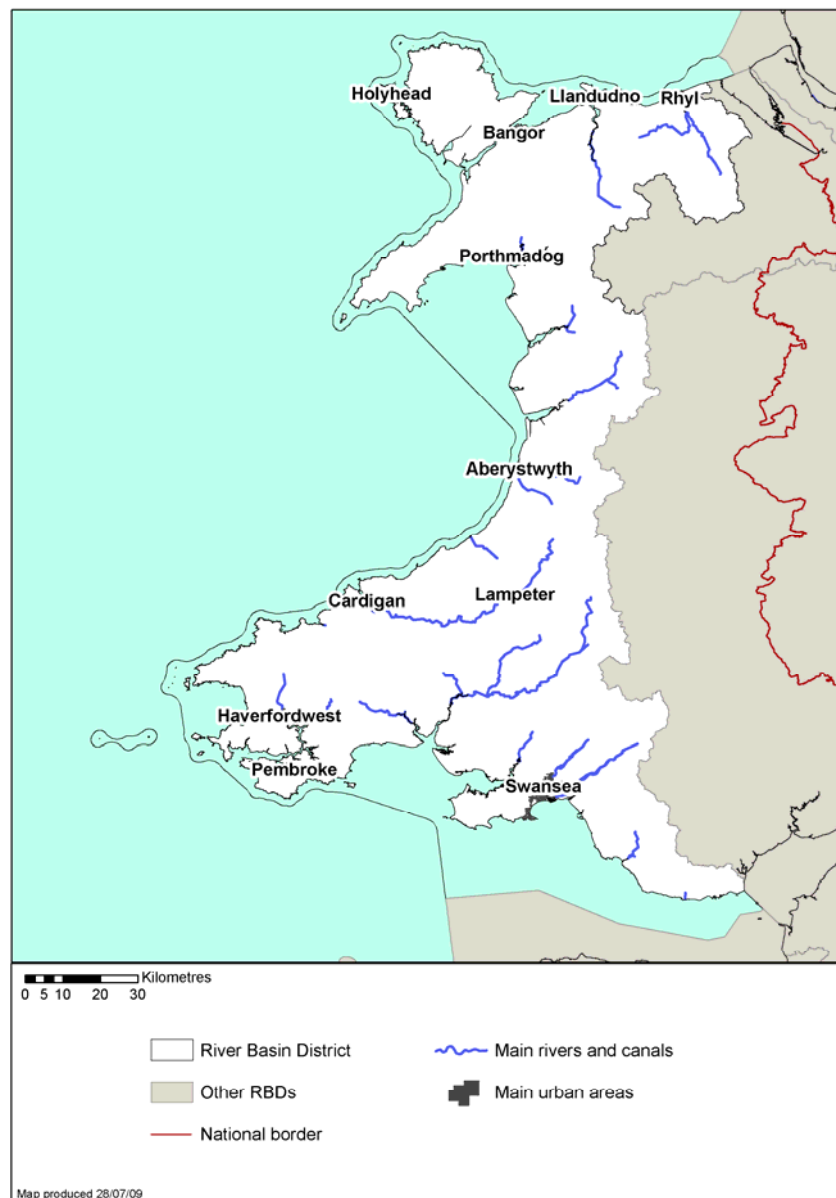


Figure 1 Map of the Western Wales River Basin District

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Dovey estuaries and many smaller beds in North Wales and Anglesey. Mussels are also farmed in the Menai Strait on some of the most productive mussel beds in Europe. The main coastal fisheries in the district are shellfisheries with extensive potting for lobsters and crabs, dredging for scallops and trawling for other species. Commercial and recreational sea angling is increasingly popular.

The majority of the upland is given over to livestock farming (in particular sheep rearing) and forestry. Dairy farming is dominant on the gentler slopes of Pembrokeshire and Carmarthenshire, and the milder climate of South Pembrokeshire also allows for significant arable production.

The dramatic environment of the district's coast including its beautiful beaches, 80 of which are EC designated bathing waters, helps explain the importance of the coastal tourism industry which contributes over £350 million each year to the Welsh economy.

Compared to other river basins the Western Wales River Basin District is not densely populated, although the coastal zone in particular has to cope with a large influx of summer visitors. Many of the pressures on the environment are widely spread and some result from the cumulative effects of many small activities. These types of pressures are referred to as 'diffuse'.

In rural areas many of the significant issues are associated with diffuse pollution from land management. Agriculture, forestry and tourism can contribute to diffuse pollution. Historical land use and the legacy this leaves can also lead to point and diffuse pollution from minewater and runoff from land contamination. Sources of phosphates and nitrates include discharges from septic tanks and sewage treatment plants as well as diffuse inputs from agriculture and rural land management. In addition, sediments, and in some cases pesticides, can also arise from land management activities from the maintenance of rivers and other watercourses for drainage and flood risk management reasons.

### Pressures on the water environment

A great deal is already being done to protect and improve the water environment. However, it will take more time, effort and resources to deal with the pressures that have significantly altered and damaged the environment over the last few hundred years.

There are a number of major challenges.

The way land is managed has given rise to complex pollution issues. This **diffuse pollution is a major pressure** on the water environment, and can come from urban areas as well as rural areas. Further improvements are needed to farming and forestry practices to protect water quality and allow wildlife to thrive. There is also an industrial legacy from metal mining in the Western Wales River Basin District.

High population densities in urban areas put pressure on the water environment. Seasonal fluctuations as a consequence of the tourist industry in this district also adds pressure on the use of resources. **Discharges from sewage works can impact on water quality** or the enjoyment of it, and water companies will implement a major programme of work to address this issue.

The environment has been modified physically, in order to carry out development, flood and coastal risk management or navigation. **Physical modification is an issue** that needs to be addressed in order to achieve more natural functioning of wetland ecosystems, and protect fish and their habitats into the future.

Natural forces such as sea level rise, coupled with climate change, can pose a threat to people, property and coastal habitats.

All these challenges relate to a range of specific pressures that need to be dealt with in this river basin district. These are:

- **pesticides** – chemical products used to kill or control pests
- **phosphate** – a plant nutrient found in sewage and fertiliser, which can cause too much algae to grow in rivers when in excess quantities
- **organic pollution** – an excess of organic matter such as manure or sewage which depletes the oxygen available for wildlife
- **mines and minewaters** – minewaters are usually acidic and contain metal contaminants such as copper, iron, manganese and zinc which can have significant ecological impacts
- **acidification** – can cause toxic metals to leach out of soils and enter surface water or groundwater, resulting in the loss of sensitive plants and animals
- **faecal indicator organisms** – pathogenic (infection causing) organisms, such as bacteria or viruses from sewage or animal excrement
- **sediment** – undissolved particles floating on top of or suspended within water, for example those caused by increased rates of soil erosion from land activities. Sedimentation can smother river life and spread pollutants from the land into the water environment.
- **invasive non-native species** - plants and animals that have deliberately or accidentally been introduced outside their natural range, and by spreading quickly threaten native wildlife and can cause economic damage

The plan also looks at other important issues, such as physical modification, urban pollution (including transport), climate change and the growth in housing and other development.

### 3 Water bodies and how they are classified

In the context of the Water Framework Directive, the water environment includes rivers, lakes, estuaries, groundwater and coastal waters out to one nautical mile. For the purposes of river basin management, these waters are divided into units called water bodies, as summarised in Table 1. In addition, this plan aims to protect wetlands that depend on groundwater.

Table 1 **Water body numbers in the Western Wales River Basin District**

	Water body types					Total
	Rivers, canals and surface water transfers (SWTs)*	Lakes and reservoirs	Estuaries (transitional)	Coastal	Groundwater	
Natural water bodies	604	19	16	18	25	<b>682</b>
Artificial water bodies	8	2	0	0	n/a	<b>10</b>
Heavily modified water bodies	64	41	11	6	n/a	<b>122</b>
<b>Total</b>	<b>676</b>	<b>62</b>	<b>27</b>	<b>24</b>	<b>25</b>	<b>814</b>

\* The total length of river covered by the Directive in this river basin district is 4224.1 kilometres.

The Water Framework Directive sets a target of aiming to achieve at least 'good status' in all water bodies by 2015. However, provided that certain conditions are satisfied, in some cases the achievement of good status may be delayed until 2021 or 2027.

#### Surface waters

For surface waters, good status is a statement of 'overall status', and has an ecological and a chemical component. Good ecological status is measured on the scale high, good, moderate, poor and bad. Chemical status is measured as good or fail.

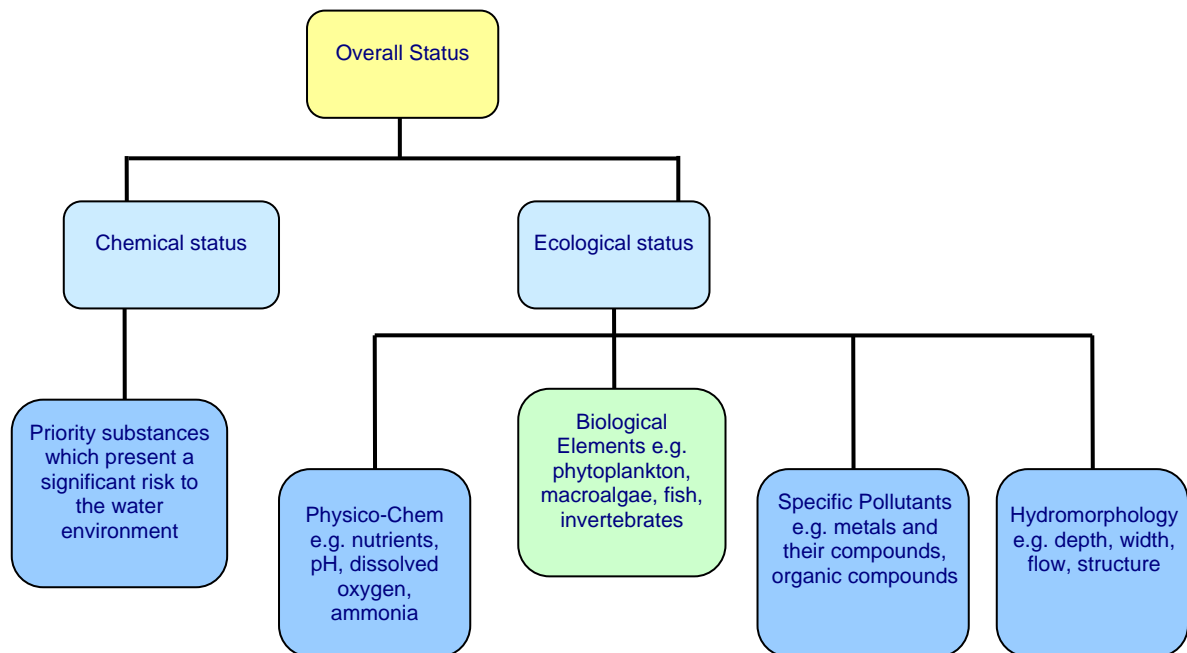
Good ecological status applies to natural water bodies, and is defined as a slight variation from undisturbed natural conditions. Figure 2 below shows how status is determined for surface waters. Each component has several different elements. These are measured against specific standards and targets developed by the Water Framework Directive UK Technical Advisory Group (UKTAG) and the European Union.

To understand the underlying reasons for water body status it is helpful to break down the results. Ecological status could be driven by the presence of a single chemical substance slightly exceeding the required standard. As well as ecological status this plan highlights the results of biological assessments (referred to as biological status) as these are the main indicators of environmental health surface waters.

#### Monitoring and components of overall status

The monitoring programme for river basin management is based on a far wider range of assessments than were carried out in the past. A range of elements are measured in each water body, and a classification is produced based on a 'one out, all out' principle. This uses the poorest individual element result to set the overall classification.

Figure 2 The components of overall status for surface water bodies



The classification of water bodies will improve as new monitoring data are collected and better methods of assessment are developed. Future monitoring will help show where environmental objectives are already being met and where more needs to be done to improve the water environment. Monitoring will also take account of the spread of invasive non-native species.

The Water Framework Directive recognises the key role that water resources and habitats play in supporting healthy aquatic ecosystems. It requires that water bodies are managed to protect or improve hydromorphological conditions. Hydromorphology is a term that covers the flow of water in a water body and its physical form. The term encompasses both hydrological and geomorphological characteristics that help support a healthy ecology in rivers, lakes, estuaries and coastal waters.

### Artificial and heavily modified waters

Some water bodies are designated as ‘artificial’ or ‘heavily modified’. This is because they may have been created or modified for a particular use such as water supply, flood protection, navigation or urban infrastructure.

By definition, artificial or heavily modified water bodies are not able to achieve natural conditions. Instead the classification and objectives for these water bodies, and the biology they represent, are measured against ‘ecological potential’ rather than status.

For an artificial or heavily modified water body to achieve good ecological potential, the chemistry of the water body must be good. In addition there must be no structural or physical changes that could impact upon biology other than those that are essential to maintain the valid uses of the water body. All non essential modifications have had to be removed or changed so that there is potential for biology to be as close as possible to that of a similar natural water body. Often though the biology will still be impacted and biological status of the water body may be less than good.

Ecological potential is also measured on the scale high, good, moderate, poor and bad. The chemical status of these water bodies is measured in the same way as natural water bodies.

## Groundwater

For groundwater, good status has a quantitative and a chemical component. Together these provide a single final classification: good or poor status. Poor quantitative status occurs if there could be adverse impacts on rivers and wetlands. Poor chemical status occurs if there is widespread diffuse pollution within the groundwater body, the quality of the groundwater is having an adverse impact on wetlands or surface waters, or the quality of water used for potable supply is deteriorating significantly. There are other objectives for groundwater quality in addition to meeting good status. These are the requirements to prevent or limit the input of pollutants to groundwater and to implement measures to reverse significant and sustained rising trends in pollutants in groundwater.

## Protected areas

Some areas require special protection under European legislation. The Water Framework Directive brings together the planning processes of a range of other European Directives. These Directives, listed in Table 2, establish protected areas to manage water, nutrients, chemicals, economically significant species, and wildlife – and have been brought in line with the planning timescales of the Water Framework Directive. Meeting their requirements will also help achieve Water Framework Directive objectives.

Table 2 **Other Directives and their Water Framework Directive protected areas**

Directive	Protected area	Number of protected areas
Bathing Waters	Recreational waters	81
Birds	Natura 2000 sites (water dependent special protection areas)	12
Drinking Water	Drinking water protected areas	86
Freshwater Fish	Waters for the protection of economically significant aquatic species	498
Shellfish Waters	Waters for the protection of economically significant aquatic species	25
Habitats	Natura 2000 sites (water dependent special areas of conservation)	60
Nitrates	Nitrate Vulnerable Zones	2% land area
Urban Waste Water Treatment	Sensitive areas	3

Achieving the objectives of these protected areas is a priority for action in this plan. Annex D sets out their objectives and the actions required for Natura 2000 sites and the new Drinking Water Protected Areas required under the Directive. Annex C describes the actions required for all protected areas. In addition, there are two new daughter Directives (Groundwater and Environmental Quality Standards) that will be used to implement specific parts of the Water Framework Directive.

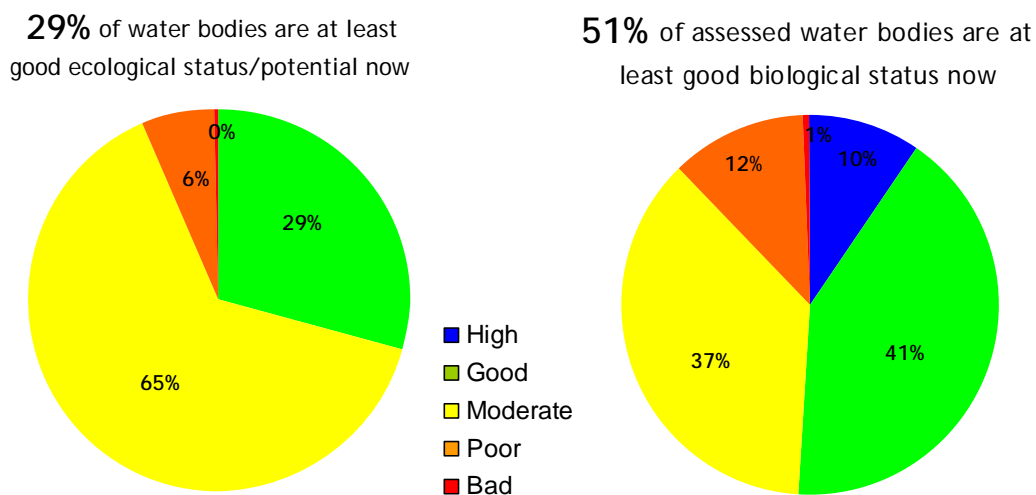
## 4 The state of the water environment now

The current status classification is the baseline from which improvements and the 'no deterioration in status' objective of the Water Framework Directive is measured. The current status classification has been updated since the draft plan. It is different to that presented in the draft plan because:

- the quality of assessments has been improved by refining classification methods;
- the accuracy of individual assessment tools has improved, especially for fish;
- a number of water bodies that were identified as potentially being heavily modified have not been designated as such in this plan because monitoring shows that they currently achieve good status;
- improvements from the water companies' Periodic Review 2004 have now been factored in;
- an additional 8 river water bodies have been classified that were previously unassessed.

29 per cent of surface waters are at good or better ecological status/potential. 51 per cent of assessed surface waters are at good or better biological status now. 789 (100%) surface water bodies have been assessed for ecology and 437 (55%) have been assessed for biology. This is shown in Figure 3.

Figure 3 **Ecological status/potential and biological status of surface water bodies now**



Statistics for both good ecological status/potential and biological status are influenced by the relative number of artificial and heavily modified waters and their classification. In the Western Wales River Basin District, 33 per cent of 132 artificial and heavily modified water bodies are currently classified as at good or better ecological potential, compared to 28 per cent of 657 natural surface water bodies at good or better ecological status. As discussed in the previous section the higher percentage of poor and bad water bodies assessed for biological status compared to ecological status/potential reflects the fact that even where all mitigation measures are in place to allow an artificial/heavily modified water body to be classified as good, the use of the water body may mean that biology is still impacted.

For groundwater bodies, currently 96 per cent are at good quantitative status. 64 per cent are at good chemical status.

## Reasons for not achieving good status or potential

This section takes a closer look at rivers. The majority of management actions in the first river basin management cycle will be applied to river water. Reasons for not achieving good status or potential in other surface waters are being developed. The first course of action for lakes, coasts and estuaries is to develop a better understanding of the issues.

To identify what needs to be done to improve the environment, the reasons for not achieving good status need to be understood. The main reasons most frequently identified by Environment Agency staff using monitoring data and their knowledge and experience of individual water bodies are shown in Table 3. Each relates to one or more pressures, which in turn impact on elements of the classification.

The reasons for failure include point source discharges from water industry sewage works, diffuse source pollution from agriculture, abstraction and a range of reasons due to physical modifications. The actions in this plan will increase the number of waters achieving good status or potential, for example through significant investment in improving discharges from sewage works and changes to land management practices. Even if good status is not completely achieved, they will also lead to improvements to the key elements impacted.

**Table 3 Main reasons (where known) for not achieving good ecological status or potential**

Reason for failure	Key elements impacted
Diffuse source agricultural	fish, invertebrates, phosphate, phytobenthos
Disused mines point and/or diffuse source	fish, iron, zinc, copper, invertebrates, diatoms
Diffuse source contaminated land (inc. landfill, excl disused mines)	cadmium and its compounds, fish, invertebrates, zinc, lead and its compounds
Physical modification water storage and supply (including for power generation)	fish, mitigation measures assessment
Point source water industry sewage works	dissolved oxygen, fish, phosphate, phytobenthos
Acidification (forestry)	fish, invertebrates
Physical modification flood protection	mitigation measures assessment
Acidification (acid deposition)	fish, invertebrates
Diffuse source natural mineralisation	fish, invertebrates, zinc
Physical modification barriers to fish migration	fish

It is important to note that because classification involves a wider range of elements than previous monitoring schemes, and many of the key pressures are complex and occur in combination, we often do not know the reason for a failure. For many water bodies either, the reasons for failure are unknown, or it is uncertain whether there is a failure or whether pressures really are causing an impact. In these cases we will need to investigate, as discussed in “Investigations – improving outcomes for 2015” in Section 6.

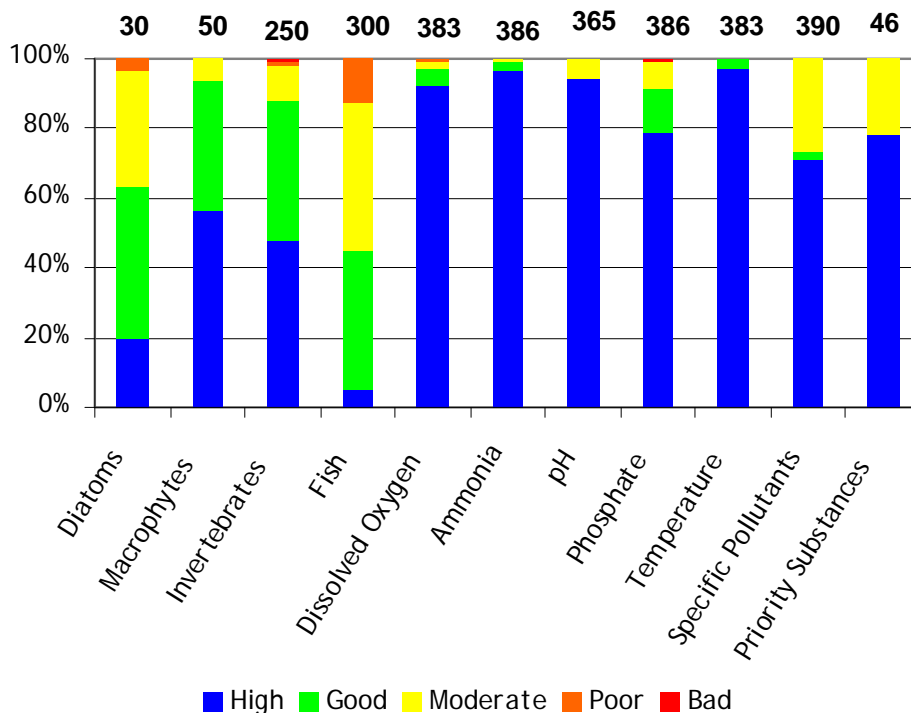
For groundwater quality the main reason for poor status is minewater discharges from historic coal and metal mining activities. There is also one failure relating to wetlands (GWDTEs) with regard to rising nitrate concentrations. Only one groundwater body, in the Thaw and Cadoxtan catchment, is currently at poor quantitative status, this is due to the estimated contribution of groundwater baseflow to surface water courses in the groundwater body. The plan identifies a range of actions to prevent deterioration and improve groundwater elements, as well as investigations to improve the confidence in groundwater classification.

## Classification of individual elements

For rivers, which comprise the majority of water bodies in the river basin district, the main elements indicating that good ecological status or potential is not being achieved are fish, invertebrates and specific pollutants. This is shown in Figure 4.

The results for macrophytes (aquatic plants) and diatoms (microscopic algae) are from relatively fewer water body assessments based on a new (2007) risk based monitoring programme. However, as would be expected, the results for these elements confirm the presence of pressures on biology in many of the assessed water bodies.

Figure 4 **Proportion of assessed river water bodies in each status class, by element** (numbers above bars indicate total number of water bodies assessed for each element)



Excessive sediment is a possible cause for biology not being good in a number of water bodies. At present however, standards are not available to assess the impact of sedimentation. The Environment Agency will be developing techniques as one of the actions in this plan.

## Biological status and monitoring

New monitoring programmes for the Water Framework Directive since 2007 focus on locations where the Environment Agency suspects there may be a problem caused by pressures on the water environment. The Environment Agency does not yet have biological assessments for all relevant water bodies. In this river basin district 55 per cent of surface water bodies have an assessment for at least one biological element. The number of water bodies covered by biological monitoring is set to increase over the next three years. As new information becomes available it is likely that some water bodies currently labelled as good biological status will be shown to have a lower quality.

For instance, from the chemical monitoring the Environment Agency is now clear that there is a link between high levels of phosphate in surface waters and biological failures in the main



river type (lowland alkaline rivers). The assessment of reasons for failure that we have started to undertake shows that across England and Wales, 22 per cent of river water bodies are failing to achieve good status/potential because of excessive levels of phosphate. In this river basin district phosphate results show that it is likely that the percentage of water bodies at good or better biological status will remain not change when additional water bodies are assessed for diatoms and/or macrophytes.

Through Ofwat's determination of the water industry periodic review of investment, the water industry will continue their investment programme targeted at addressing their contribution to phosphate pollution. It is important that agriculture also makes a contribution in the first cycle improvements.

The Environment Agency is now working with the main farming groups to understand better the main ways in which phosphate from land enters and is transported in water bodies. Farming groups have agreed to use this information to encourage individual farmers to take action to reduce their contribution to water pollution.

## 5 Actions to improve the water environment by 2015

The following gives an overview of the key contributions from sectors and organisations that the Environment Agency will work with to implement this plan.

[All sectors](#)

[Agriculture and rural land management](#)

[Angling, fisheries and conservation](#)

[Central government](#)

[Environment Agency](#)

[Industry manufacturing and other business](#)

[Local and regional government](#)

[Mining and quarrying](#)

[Navigation](#)

[Urban and transport](#)

[Water industry](#)

[Individuals and communities](#)

**These actions are summarised versions of the full programme of actions that can be found in Annex C.**

The lead organisation for each action is given in brackets. Note that many actions will involve more than one sector and need to be implemented in partnership. Actions in Annex C are therefore duplicated across the relevant sectors. Sectors are encouraged to put further actions forward during the implementation of this plan.

After the action tables there are sections on:

[Actions to protect drinking water](#)

[The costs of action in this plan](#)

[Taking action in a changing climate](#)

[Working with other plans and programmes](#)

### All sectors

All sectors must comply with the range of existing regulations, codes of practice and controls on the use of certain substances.

Investigations will be carried out by the Environment Agency and partner organisations where appropriate, to establish the extent and source of pressures and to identify any further actions that are technically feasible and not disproportionately costly. These actions will be carried out during this or future management cycles.

Investigations and actions will also be carried out in drinking water protected areas (where necessary focused in safeguard zones) to reduce the risk of deterioration in raw water quality and therefore reduce the need for additional treatment to meet drinking water standards.

### Agriculture and rural land management

The Western Wales River Basin District is predominantly rural in nature. Agriculture and forestry are the main land uses. The majority of the land is down to grass with livestock farming the principal activity. Beef and in particular, sheep production is dominant in the uplands, dairying is dominant on the gentler slopes of Pembrokeshire and Carmarthenshire, while the milder climate of South Pembrokeshire allows for significant arable production.

This sector has a big role in looking after and improving the quality of the rural environment. A combination of incentive, advisory and regulatory measures have been in place for a number of years to help farmers and other land managers protect the environment. These include the Code of Good Agricultural Practice and agri-environment schemes, such as Glastir. Wise stewardship of resources such as soil, nutrients, water and energy helps to cut costs while maintaining or improving the productivity of land and livestock.

Nevertheless, the way in which land is managed is still having a negative impact on natural resources and further action is needed to address diffuse pollution and other key pressures in rural areas. Government will consider the introduction of further restrictions of activities and restrictions on chemicals where there is evidence that voluntary actions failed to deliver.

Example actions
<p><b>Cross-Compliance</b> – to help farmers comply with a range of Directives to reduce pollution from agriculture at farms receiving subsidies (all land managers).</p> <ul style="list-style-type: none"> <li>• Across the river basin district</li> </ul>
<p><b>Pesticides statutory code of practice</b> – advice for operators on control of plant protection products to prevent and limit pollution of waters (all operators).</p> <ul style="list-style-type: none"> <li>• Across the river basin district</li> </ul>
<p><b>Invasive non-native species</b> – working with farmers and the general public to raise awareness on the issues of invasive non-native species.</p> <ul style="list-style-type: none"> <li>• Across the river basin district</li> </ul>
<p>Follow <b>Sheep Dip Statutory Code of Practice</b> – advise for operators and investigations on the impact of sheep dip on rivers.</p> <ul style="list-style-type: none"> <li>• Across the river basin district</li> </ul>
<p>Improving catchment environmental quality through better <b>Soil and Nutrient Management</b> in livestock farming landscapes.</p> <ul style="list-style-type: none"> <li>• Conwy and Clwyd Catchment</li> </ul>
<p>Education, training and awareness with farmers, land managers and Forestry Commission Wales to address <b>diffuse pollution</b> issues associated with agriculture, forestry and woodland management.</p> <ul style="list-style-type: none"> <li>• Across the river basin district</li> </ul>
<p>Reduce the impacts of <b>acidification</b> in upland areas using restructuring of upland forests in headwaters at a high risk of impact from acidification.</p> <ul style="list-style-type: none"> <li>• Across the river basin district</li> </ul>

### Angling and conservation

The angling and conservation sector has a large role to play in delivering local 'on the ground' improvements to the water environment as well as working to establish new mechanisms. It engages communities and individuals, building on their skills, experience and local knowledge and actively involves them in making these improvements. Recreational inland and coastal fishing in Wales brings in an annual income of around £148 million. There were over 70,000 rod licences sold to Welsh addresses in 2008.

Many environmental organisations can influence environmental quality through the land they own or manage. Riparian owners have specific responsibility for the management of their watercourses so their support, involvement and investment in implementing the actions is crucial.

Example actions
<p>Extend <b>eel populations survey</b> to increase knowledge of stock levels and distribution. Also look at easing eel passage taking account of availability of upstream habitats.</p> <ul style="list-style-type: none"> <li>• Across the river basin district</li> </ul>

Promote the ' <b>River Fly Partnership</b> ' monitoring programme to assess the status of river health. <ul style="list-style-type: none"> <li>• Across the river basin district</li> </ul>
Work with <b>Afonydd Cymru and The Association of Rivers Trusts</b> to alleviate migration barriers and other pressures on the water environment. <ul style="list-style-type: none"> <li>• Across the river basin district and particularly on the Tywi and Clwyd</li> </ul>
<b>Contain and control invasive non-native species</b> by promoting an All Wales records centre agreement to enable collation and sharing of data on invasive non-native species. Working with the Wales Biodiversity Partnership, invasive non-native species sub group. <ul style="list-style-type: none"> <li>• Across the river basin district</li> </ul>

### Central government

Government will continue to influence the development of European legislation to help bring forward initiatives that protect and improve the water environment, and that are technically feasible and not disproportionately costly. Welsh Assembly Government are considering further policy options to help improve ambition in achieving objectives in this first plan cycle. These include controls on phosphate in detergents and options to increase the use of sustainable drainage systems to reduce risks of flooding and pollution of surface waters during periods of high rainfall.

The Environment Agency, the Countryside Council for Wales and the Forestry Commission Wales are the key government agencies for this plan. The agencies will work together on relevant actions.

Example actions
Implement the water related actions of the <b>Invasive Non-native Species Framework</b> Action Plan for Great Britain (Welsh Assembly Government, Defra, Environment Agency) . <ul style="list-style-type: none"> <li>• Nationally</li> </ul>
Promote the Code for <b>Sustainable Homes</b> and BREEM standards in national planning policy. <ul style="list-style-type: none"> <li>• Nationally</li> </ul>
<b>Sustainable drainage</b> – promote the wide-scale use of sustainable drainage. <ul style="list-style-type: none"> <li>• Nationally</li> </ul>
Investigations and advise in targeted rural catchments to improve the impacts caused by <b>rural diffuse pollution</b> . <ul style="list-style-type: none"> <li>• Across the river basin district</li> </ul>
<b>Codes of Good Agricultural Practice</b> – using targeted campaigns to ensure effective implementation of the codes of good agricultural practice. <ul style="list-style-type: none"> <li>• Across the river basin district</li> </ul>

### Environment Agency

The Environment Agency is the Government’s lead agency for implementing the Water Framework Directive. We will continue to monitor, provide advice and manage improvements to the water environment. We regulate discharges to and abstraction from the water environment by issuing and enforcing environmental permits and licences. Where necessary we take enforcement action against those who act illegally and damage or put at risk the water environment. We also have responsibility to make sure there is enough water to meet the needs of industry, agriculture and wider society in the future.

We will work closely with all sectors to learn from them, build on existing knowledge and to develop a shared commitment to implementing environmental improvements.

Example actions
Continue to develop investigative, and operational <b>monitoring programmes</b> , to maintain our understanding of the state of the water environment (Environment Agency). <ul style="list-style-type: none"> <li>• Across the river basin district</li> </ul>
<b>Investigations</b> at sites identified under the Restoring Sustainable Abstraction programme (Environment Agency). <ul style="list-style-type: none"> <li>• Across the river basin district</li> </ul>
<b>Run local pollution prevention campaigns</b> (Environment Agency) to raise awareness of the need for responsible handling and disposal of chemicals, oil and other pollutants. <ul style="list-style-type: none"> <li>• Specified water bodies identified at risk</li> </ul>
Action to <b>reduce the physical impacts of flood risk management</b> activities in artificial or heavily modified water bodies (Environment Agency). <ul style="list-style-type: none"> <li>• Waters specified in Annex C</li> </ul>
Control and eradication of topmouth gudgeon and water primrose. <ul style="list-style-type: none"> <li>• Specified water bodies identified at risk</li> </ul>

### Industry, manufacturing and other business

Whilst primarily rural, Western Wales is also home to many businesses. Thriving marine, oil and gas industries are critical economic activities, along with heavy industry such as the steel works at Port Talbot, coal mining and commercial fisheries. The activities of these businesses can directly or indirectly affect the water environment.

Most relevant actions in this plan are already underway or are part of the existing regulatory system. However, some actions are new, and will help reduce nutrients such as phosphate and will help meet tighter standards on ammonia and 40 other priority substances and pollutants in the river basin district. Where appropriate, industry will participate in pollution prevention campaigns and in investigations to establish the extent and source of pressures to define any further actions required for this and future plan cycles.

Example actions
<b>Comply with regulations</b> such as Environmental Permitting, Environmental Damage and Groundwater, to limit environmental damage and help prevent land contamination, pollution and deterioration of waters. <ul style="list-style-type: none"> <li>• Nationally</li> </ul>
Voluntary <b>pollution prevention and remediation</b> of existing land contamination, to bring land back into beneficial use and remove potential sources of groundwater contamination. <ul style="list-style-type: none"> <li>• Sites contributing to potential environmental quality standard failure</li> </ul>
Run <b>pollution prevention advice and campaigns</b> to provide targeted advice and enforcement (Environment Agency) to reduce contaminants being released to groundwater from industrial estates, petrol stations and other sources. <ul style="list-style-type: none"> <li>• High risk areas</li> </ul>
Campaigns and advice on the correct disposal practices for waste oils and fats. <ul style="list-style-type: none"> <li>• Across the river basin district</li> </ul>
Investigations at selected <b>landfill sites</b> to assess leachate emissions and controls to prevent contamination of groundwaters and surface waters. <ul style="list-style-type: none"> <li>• Clwyd – Tidal Limit to Hesbin</li> </ul>
Investigation into the impact of <b>commercial shell and fin fisheries</b> to improve the risk assessment of the impact of such activities on ecology. Appropriate actions to deal with any impacts will be developed. <ul style="list-style-type: none"> <li>• Across the river basin district</li> </ul>

## Local and regional government

Local and regional government have a major role in implementing this plan. The sector has a far reaching influence on businesses, local communities and leisure and tourism sectors. The 13 unitary authorities (Vale of Glamorgan, Bridgend, Neath Port Talbot, Swansea, Carmarthenshire, Ceredigion, Powys, Denbighshire, Conwy, Flintshire, Gwynedd, Isle of Anglesey, Pembrokeshire) and the 3 National Parks (Snowdonia, Brecon Beacons and Pembrokeshire) also have duties and powers in relation to planning, waste and minerals, regeneration and land contamination, highways, transportation, emergency planning, countryside management, bathing waters, potable drinking water for private water supplies and other activities. Town and Community Councils exist at the local level across the whole of the river basin district.

Many of the actions identified in the plan form part of this sector's normal work. The Environment Agency and others will work with Local Authorities to ensure that all relevant actions are identified, prioritised, resourced and implemented.

Example actions
Produce <b>guidance for planning authorities</b> in partnership with Royal Town Planning Institute (Environment Agency), to support this plan. <ul style="list-style-type: none"><li>• Across the river basin district</li></ul>
Ensure that <b>planning policies and spatial planning documents</b> take into account the objectives of the Western Wales River Basin Management Plan, including Local Development Plans. <ul style="list-style-type: none"><li>• Across the river basin district</li></ul>
Action to <b>reduce the physical impacts of urban development</b> in artificial or heavily modified waters, to help waters reach good ecological potential (Local Authorities). <ul style="list-style-type: none"><li>• Waters specified in Annex C</li></ul>
Promote the use of <b>sustainable drainage systems</b> in new urban and rural development where appropriate, and retrofit in priority areas including highways where possible (Environment Agency, Local Authorities). <ul style="list-style-type: none"><li>• Across the river basin district</li></ul>

## Mining and quarrying

There has been a long history of coal and metal mining activities in the Western Wales River Basin District. The metal mine industry has left a legacy of both archaeological and historic significance bringing many mining enthusiasts to areas such as Parys Mountain on Anglesey, and having an impact on the water quality in certain catchments, in particular in Ceredigion and the Isle of Anglesey. Working with partners, Environment Agency Wales has an established Strategy for investigation and remediation of these sites.

A limited amount of coal mining continues in the Ogmere to Tawe catchment. This includes a small number of underground mines and open cast, these are regulated by the Coal Authority.

Example actions
The <b>Coal Authority's</b> minewater preventative and remediation programme. <ul style="list-style-type: none"><li>• Nationally</li></ul>
<b>The Metal Mine Strategy for Wales</b> will continue to investigate and assess remediation options for metal mines. <ul style="list-style-type: none"><li>• Across the river basin district – details on specific catchments are given in Annex C</li></ul>
<b>Pollution Prevention</b> advice to land owners and users to reduce impacts results from the disturbance of spoil former mined sites. <ul style="list-style-type: none"><li>• Across the river basin district</li></ul>

## Navigation

Ports, harbours and marinas are essential for economic prosperity. Many navigation and port authorities have already done a great deal to help improve ecology and water quality and some harbours are home to internationally important wildlife. Careful planning will be needed to ensure that waters remain navigable whilst at the same time water quality is protected and improved.

Proposals to build new ports or expand existing ones need to take sustainable water management goals into account. Physical changes are permitted to waters for navigation but only if certain conditions are met.

The Western Wales coast is also popular with tourists and recreational boaters. We want to encourage recreation in the river basin district, whilst taking action to minimise any environmental impacts.

Example actions
<b>Ban Tributyltin (TBT) use</b> on ship hulls unless there is a coating to prevent leaching of underlying TBT anti-foulants, to prevent or limit pollution in marine waters (Marine and Fisheries Agency, Welsh Assembly Government and others). <ul style="list-style-type: none"><li>• Nationally</li></ul>
<b>Develop a dredging and disposal framework</b> (Ports sector), which will provide guidance to all those undertaking or permitting navigation dredging and dredged material disposal activities to assist in achieving the statutory objectives of the Water Framework Directive and related Environmental Quality Standards Directive (2008/105/EEC). <ul style="list-style-type: none"><li>• Nationally</li></ul>
For boat users and recreational activities, <b>develop guidance notes</b> for best practice to reduce the disturbance to habitats, this will be linked to a wider code of practice to boat users. <ul style="list-style-type: none"><li>• Across the river basin district</li></ul>

## Urban and transport

Development and regeneration is a major opportunity to improve the water environment. However, when poorly planned or designed, urban and transport infrastructure can adversely impact on water quality or water resources. The Environment Agency and others want to work with the urban and transport sector to achieve an urban water environment rich in wildlife that local communities can benefit from and enjoy.

A good quality water environment has the potential to help economic regeneration and to enhance the economic and social amenity value of developments, and improve the quality of life in cities, towns and villages.

Spatial planning and design for urban development and infrastructure should aim to reduce surface water run off; protect and restore habitats; improve the quality of rivers, coastal waters, and groundwater, and thus protect drinking water supplies and bathing areas. The release of toxic pollutants that harm the water environment also needs to be reduced.

Example actions
Reduce the disposal of fat, oil and grease to sewers using <b>awareness campaigns</b> . <ul style="list-style-type: none"><li>• Across the river basin district</li></ul>
Action to <b>reduce the physical impacts of urban development</b> in artificial or heavily modified water bodies, to help waters reach good ecological potential (Local Authorities). <ul style="list-style-type: none"><li>• Waters specified in Annex C</li></ul>
<b>Run pollution prevention advice and local campaigns</b> to provide targeted advice and enforcement on farm and land management, domestic oil storage, septic tanks (Environment Agency). <ul style="list-style-type: none"><li>• Across the river basin district</li></ul>

Influence behaviour using **awareness campaigns** for surface water run-off, sustainable drainage, rainwater harvesting etc.

- Across the river basin district

## Water industry

Water companies are major partners in the management and protection of the water environment. The Environment Agency works with companies, consumers and government to ensure that the sector's environmental work is planned and implemented in a way that is affordable for the public.

Improvement of continuous and intermittent sewage effluent discharges and of water resources management will be carried out as part of the ongoing water industry asset management programme.

The companies' programme of work under the periodic review of water industry investment in 2009 will make a large contribution to meeting the objectives in this plan. This includes carrying out investigations, and specific improvement schemes to address water quality or water resources.

In addition, specific actions will be carried out in drinking water protected areas to help safeguard drinking water supplies.

### Example actions

**Reduce leakage** through active leakage control and customer supply pipe repair policies to help ensure sufficient water for people and wildlife (water companies).

- Across the river basin district

Complete the **current round of water company asset investment** to deliver water quality improvements and reduce the impact of abstraction (water companies).

- Rivers, coasts, estuaries and groundwater bodies across the river basin district

**Improvements to water company assets** under the next round of company investment (Asset Management Programme – AMP5), to deliver water quality improvements and continue to reduce the impact of abstraction under a range of environmental Directives (water companies).

- Rivers, coasts, estuaries and groundwater bodies across the river basin district

Influence behaviour using awareness campaigns for surface water run-off, **sustainable drainage**, rainwater harvesting etc.

- Across the river basin district

**Investigation of emissions from Sewage Treatment Works** and appraise options on whether to treat at source or treat at the Sewage Treatment Works.

- Catchments identified in Annex C

## Individuals and communities

Everyone can help protect and improve the water environment. Actions people can take include the following.

### To save water

*in houses or offices*

- Turn off the tap when brushing teeth, and take short showers rather than baths.
- Wash fruit and vegetables in a bowl rather than under the running tap - and use the remainder on plants.
- Install a 'hippo' or 'save-a-flush' in toilet cisterns.



- Run dishwashers or washing machines with a full load on an economy setting, and boil the minimum amount of water needed in kettles or saucepans.
- Purchase low energy and low water use appliances.
- Hand wash cars.
- Ask water companies to fit a meter. This can reduce household water consumption.
- Install a low-flush toilet, put flow regulators on taps and showers, and install waterless urinals at work.
- Consider installing rain water harvesting systems in homes or workplaces. This can save one third of domestic mains water usage.
- Ensure that any off-road parking or patio around the house use permeable materials so rain can soak into the soil.

#### *in gardens*

- Choose plants that tolerate dry conditions. To help lawns through dry periods, don't cut them too short.
- To save water in gardens, collect rain in a water-butt, water at the beginning or end of the day, mulch plants, and use watering cans where possible instead of sprinklers or hosepipes.
- Fix dripping taps, and lag pipes to avoid them bursting in freezing weather.

#### **To prevent pollution**

- Use kitchen, bathroom and car cleaning products that don't harm the environment, such as phosphate-free laundry detergents, and use as little as possible. This helps prevent pollution.
- Take waste oil and chemicals such as white spirit to a municipal recycling facility: don't pour them down the sink or outside drains.
- Check that household appliances are connected to the foul sewer, not the surface water drain.
- Ensure septic tanks or private sewage treatment plants are well maintained and working effectively.
- Ensure household oil storage is in good condition, with an up-to-date inspection record.
- Report pollution or fly-tipping to the Environment Agency on 0800 807060.
- Ensure extensions or conservatories have their roof water draining into a soakaway or sustainable drainage system and are not connected to the combined sewer.

#### **To protect water dependent wildlife**

- Put cotton buds and other litter in the bin, not down the toilet. It may end up in the sea where it can harm wildlife.
- Eat fish from sustainable sources, caught using fishing methods that don't cause damage to marine wildlife and habitats.
- Seek expert advice to eliminate invasive non-native species from gardens, disposing of them responsibly. Do not buy, plant or release invasive non-native species.
- Adopt-a-beach to help keep beaches clean of litter than can harm wildlife and cause pollution.
- Join a river group to spot pollution, invasive non-native species, and take part in practical tasks.

## **Actions to protect drinking water**

Drinking water supplied to households by water companies is of high quality and complies with strict standards enforced by the Drinking Water Inspectorate. Where water is abstracted from a water body for human consumption, the water body is designated as a Drinking Water Protected Area (DrWPA) – additional objectives apply and where necessary, additional action is put in place to protect the quality of the raw water abstracted.

Where we are reasonably confident that the DrWPA objective is at high risk of not being complied with, a Safeguard Zone has been identified. In the Safeguard Zone additional actions will take place. These may include voluntary agreements, pollution prevention campaigns and targeted enforcement action of existing legislation. Additional monitoring is taking place to assess whether those DrWPAs currently not assessed at high risk, need a Safeguard Zone and additional action taken.

## **The costs of action in this plan**

Overall the Environment Agency estimate that the cost for implementing the actions in the Western Wales River Basin Management Plan will be £50 million annually. A significant proportion of this cost relates to existing measures. The existing measures are mainly required to fulfil the requirements of earlier EC Directives and are defined as the Reference Case in the Impact Assessment.

There are new measures in the plan which we estimate to cost £1 million with a benefit of £15 million. In addition investigations will be carried out that will help to identify the additional measures necessary in future planning cycles. The new measures are defined as the Policy Option in the Impact Assessment

Further information on the approach used to assess the costs and benefits is contained in the Impact Assessment.

## **Taking action in a changing climate**

The UK's Climate Projections (UKCP09) show that this region is likely to experience hotter drier summers, warmer wetter winters and rising sea levels. This is likely to have a significant effect on environmental conditions and will increase the impact of human activity on the water environment. Table 4 shows the likely effects of climate change on known pressures and the risk they pose on the water environment in the river basin district.

It is essential that the actions in this plan take account of the likely effects of climate change. What is done now must not make it harder to deal with problems in the future.

Most actions in this plan will remain valid as the climate changes. Others can be adapted to accommodate climate change.

**Table 4 Qualitative assessment of increased risk from climate change by 2050 and beyond**

Pressure	Increased risk
Abstraction and other artificial flow regulation	Very high
Nutrients (nitrate and phosphate)	High
Sediment	High
Biological (invasive non-native species)	Medium
Physical modification	Medium
Microbiology (including faecal indicator organisms)	Medium
Organic pollution (sanitary determinands)	Medium
Salinity	Medium
Priority hazardous substances, priority substances and specific pollutants, such as pesticides	Medium
Biological (fisheries management)	Medium
Acidification	Low: freshwater Medium: Marine
Temperature of point source discharges	Low

It is important to assess the carbon implications of the plans to avoid adding unnecessary carbon dioxide burdens that could increase the problem of climate change.

The carbon costs associated with actions in the water industry Periodic Review 2009 (PR09) have been quantified. This is where the most significant carbon impacts will occur as the actions will require additional water treatment, construction of new works or upgrades to existing sites.

The approximate operational carbon implications (this does not include scheme construction carbon implications) of PR09 measures in England and Wales is approximately 4,722,000 tonnes per year at the start of the PR09 cycle (2009-10) and 4,564,200 tonnes per year at the end of the PR09 cycle (2014-2015). These figures are from the water company plans and result from schemes to satisfy a number of existing drivers such as Urban Waste Water Directive and Bathing Waters Directive as well as the Water Framework Directive. Specific Figures for water companies can be found in water company plans.

Because there are no PR09 measures specifically required by the Water Framework Directive in this river basin district, there is no additional operational carbon component driven by the additional requirement to meet good status under the Water Framework Directive.

The majority of other actions are likely to have low impact as they are investigations, partnerships or encouraging best practice management. The potential impact of these can be assessed as the work is progressed.

No organisation has sole responsibility for ensuring that society adapts successfully to the effects of climate change on the water environment. Most will be achieved by working together and in partnership. This River Basin Management process provides an excellent framework to help focus and co-ordinate activities. In particular it will allow action to be taken on existing pressures at sites that are at risk and where appropriate restore the natural characteristics of catchments to protect water quality, maintain water resources and reduce the risks of floods and droughts thus building resilience to the further impacts of climate change.

## **Working with other plans and programmes**

A wide range of planning processes help ensure more sustainable management of the water environment. They are briefly described here.

### **Development planning**

Development planning plays a key role in sustainable development and the Environment Agency will continue to work closely with planning authorities. We aim to ensure that planners understand the objectives of the Water Framework Directive and are able to translate them into planning policy.

There are many planning processes and provisions involved. They include:

- national legislation;
- Welsh Assembly Government Planning Policy and associated guidance;
- Wales Spatial Plan;
- Local Development Plans;
- local guidance (e.g. Supplementary Planning Documents);
- delivering the planning application process.

In the Western Wales River Basin District, there are already spatial plans which set out proposed levels of growth and development. These will be superseded by the new Local Development Plan.

In the Western Wales River Basin District, the Environment Agency is already working with water companies and local government to assess the implications of new development on sewage treatment works discharges and consequently on receiving river water quality. To date, it indicates that forecast growth must pay special attention to phosphate.

Good development planning needs to consider a number of issues relevant to the Western Wales River Basin District, including housing locations, flood risk, sewage treatment options, initiatives to reduce storm water flow to sewage works, water efficiency measures and the reduction of nutrients from diffuse pollution. The Environment Agency and others will continue to work to help clarify the way forward.

### **Flood risk, coastal erosion planning**

There is a separate planning process for flood and coastal erosion risk management introduced by the new European Floods Directive (Directive 2007/60/EC on the assessment and management of flood risks). This requires that the environmental objectives of the Water Framework Directive are taken into account in flood and coastal erosion plans.

Implementation of the Floods Directive in England and Wales will be co-ordinated with the Water Framework Directive. The delivery plans and timescales for the two directives will be closely aligned.

Catchment Flood Management Plans (prepared by the Environment Agency) and Shoreline Management Plans (prepared by local coastal authorities and the Environment Agency) set out long term policies for flood risk management. The delivery of the policies from these long term plans will help to achieve the objectives of this and subsequent River Basin Management Plans.

The Environment Agency plans its flood and coastal risk management capital investment through the 'Medium Term Plan', which is a rolling five-year investment plan. Using this, we have identified flood and coastal risk management activities that will deliver one or more restoration or mitigation measures included in this plan. Although these activities will be carried out for flood risk management purposes, activities will not lower water body status unless fully justified under Article 4.7 of the Water Framework Directive.

## **Marine planning**

The Marine Strategy Framework Directive is closely linked with the Water Framework Directive and their application overlaps in estuaries and coasts. The Environment Agency is working with Defra, and the Welsh Assembly Government and others to ensure that the implementation of both Directives is fully integrated.

## **Managing new physical modifications**

In specific circumstances the Water Framework Directive provides a defence for when, as a result of a new physical modification, good ecological status or potential cannot be achieved or where deterioration in status occurs. This is covered under Article 4.7 of the Directive.

Although protecting the water environment is a priority, some new modifications may provide important benefits to human health, human safety and/or sustainable development.

Such benefits can include:

- public water supply;
- flood defence/alleviation;
- hydropower generation;
- navigation.

It is often impossible to undertake such activities without causing deterioration of status to the water body. The benefits that such developments can bring need to be balanced against the social and economic benefits gained by maintaining the status of the water environment in England and Wales.

The Environment Agency has developed a process for applying the tests and justifications required for such new modifications (Article 4.7) and will work with stakeholders to ensure these provisions are met during the first cycle of river basin management.

## **Other planning processes**

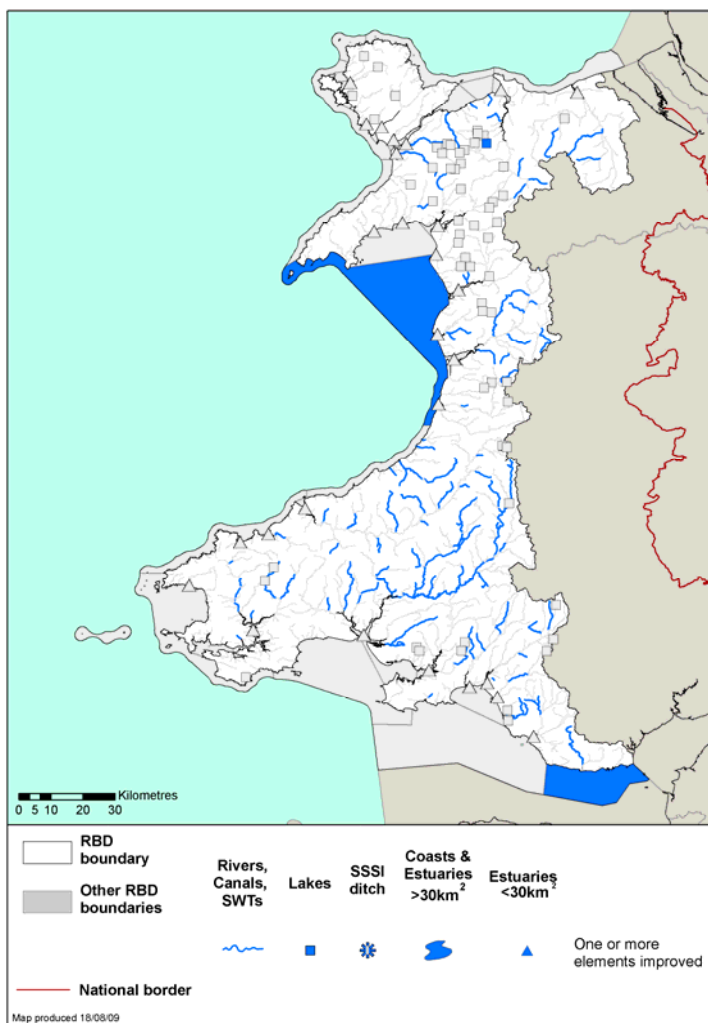
The Environment Agency is also working to align planning processes in other areas. These include water resources and water quality, agriculture and rural development and natural heritage. Annex J provides further information about other planning processes.

## 6 The state of the water environment in 2015

One of the objectives of the Water Framework Directive is to aim to achieve good status in water bodies by 2015. However, for 64 per cent of water bodies this target cannot be met by this date. Greater improvement in status is limited by the current understanding of pressures on the water environment, their sources, and the action required to tackle them.

By 2015, 13 per cent of surface waters – 105 water bodies – will show an improvement by 2015 for one or more of the elements measured. This translates to 900 kilometres of river or canal improved, and is illustrated in Figure 5.

Figure 5 **Surface water bodies showing an improvement for one or more element by 2015**

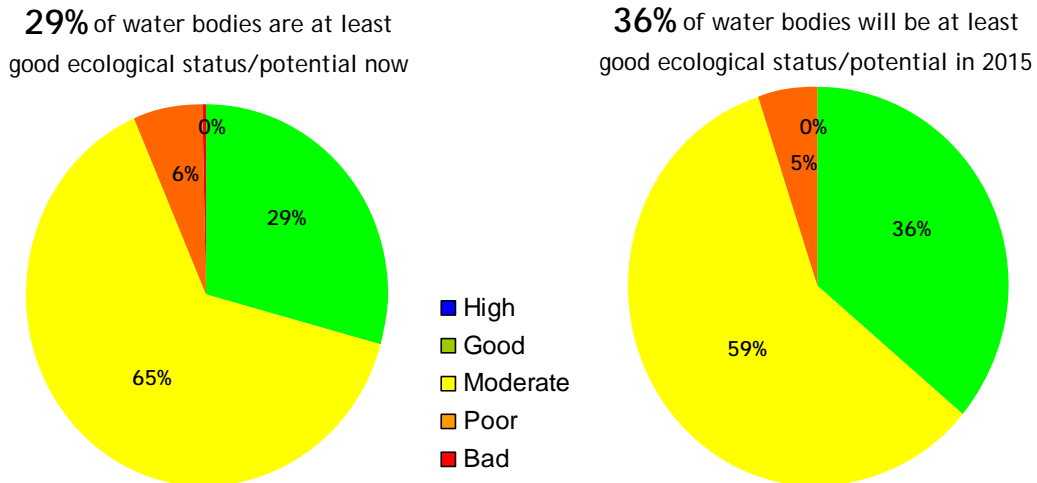


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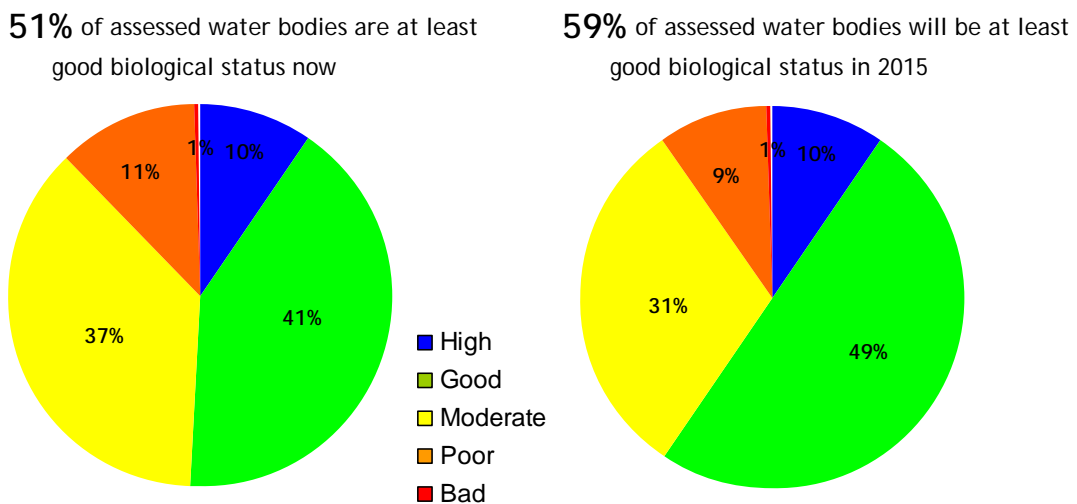
There will be tangible benefits from meeting these objectives. For example, major investment in the water industry will continue to address problems such as the high levels of nutrients in sewage effluent.

Figures 6 and 7 show what ecological and biological status will be in 2015 compared to now. By 2015, 36 per cent will be in at least good ecological status/potential and 59 per cent of assessed surface waters will be in at least good biological status. A map showing predicted status for surface water bodies in 2015 is provided in Figure 9. Figures 10 and 11 show the predicted quantitative status and chemical status for groundwater in 2015.

**Figure 6 Ecological status/potential of surface water bodies now and in 2015**

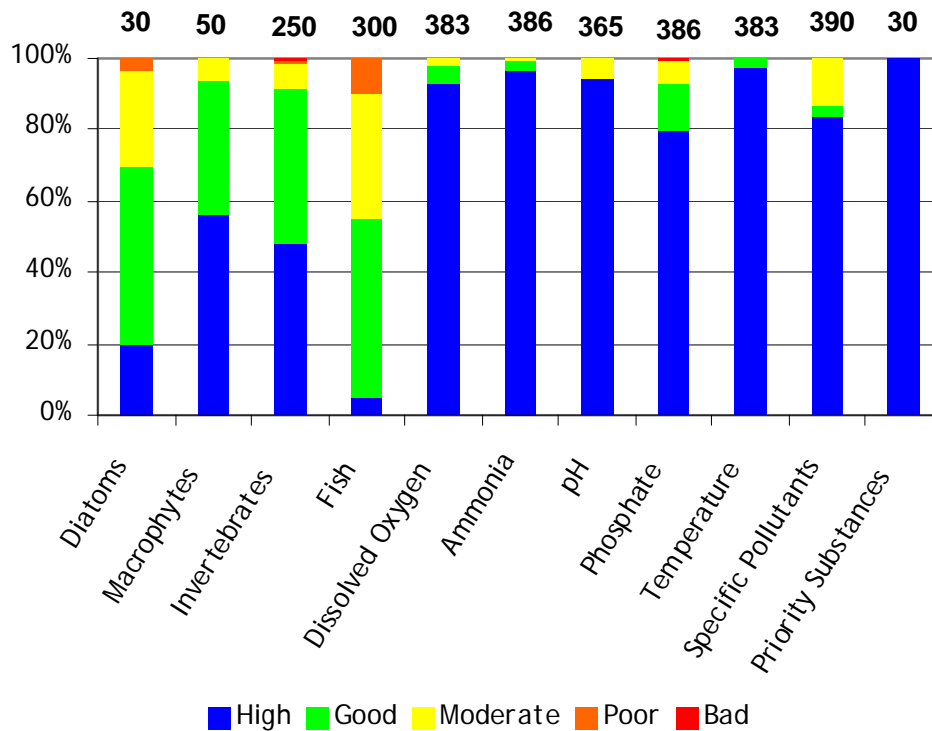


**Figure 7 Biological status of assessed surface water bodies now and in 2015**



For the 132 artificial and heavily modified water bodies, 35 per cent will be in at least good ecological potential in 2015, compared to 36 per cent of 657 natural surface water bodies at good or better ecological status.

Figure 8 **Predicted proportion of river water bodies in each status class, by element for 2015** (numbers above bars indicate total number of water bodies assessed for each element)



For many estuaries, coasts and lakes it is unlikely that an improvement in the number of water bodies at 'good' status/potential can be achieved by 2015. The biological tools and monitoring data needed to classify these types of water bodies have only recently been developed. There is limited knowledge about the pressures that affect many of these water bodies and how their biology responds to changes in these pressures. It has therefore not been possible to identify many additional cost effective and proportionate measures. In many cases though there will be improvements to some key elements as the result of actions in this plan and there will be investigations to help find technically feasible actions that are not disproportionately costly. The Environment Agency wants these waters to achieve good overall status or potential by 2021 or 2027.

There will be no deterioration in groundwater status by 2015, but improvement will take place over longer timescales.

Looking at overall status, the combination of ecological status and chemical status, 36 per cent of surface water bodies are expected to meet good overall status by 2015.

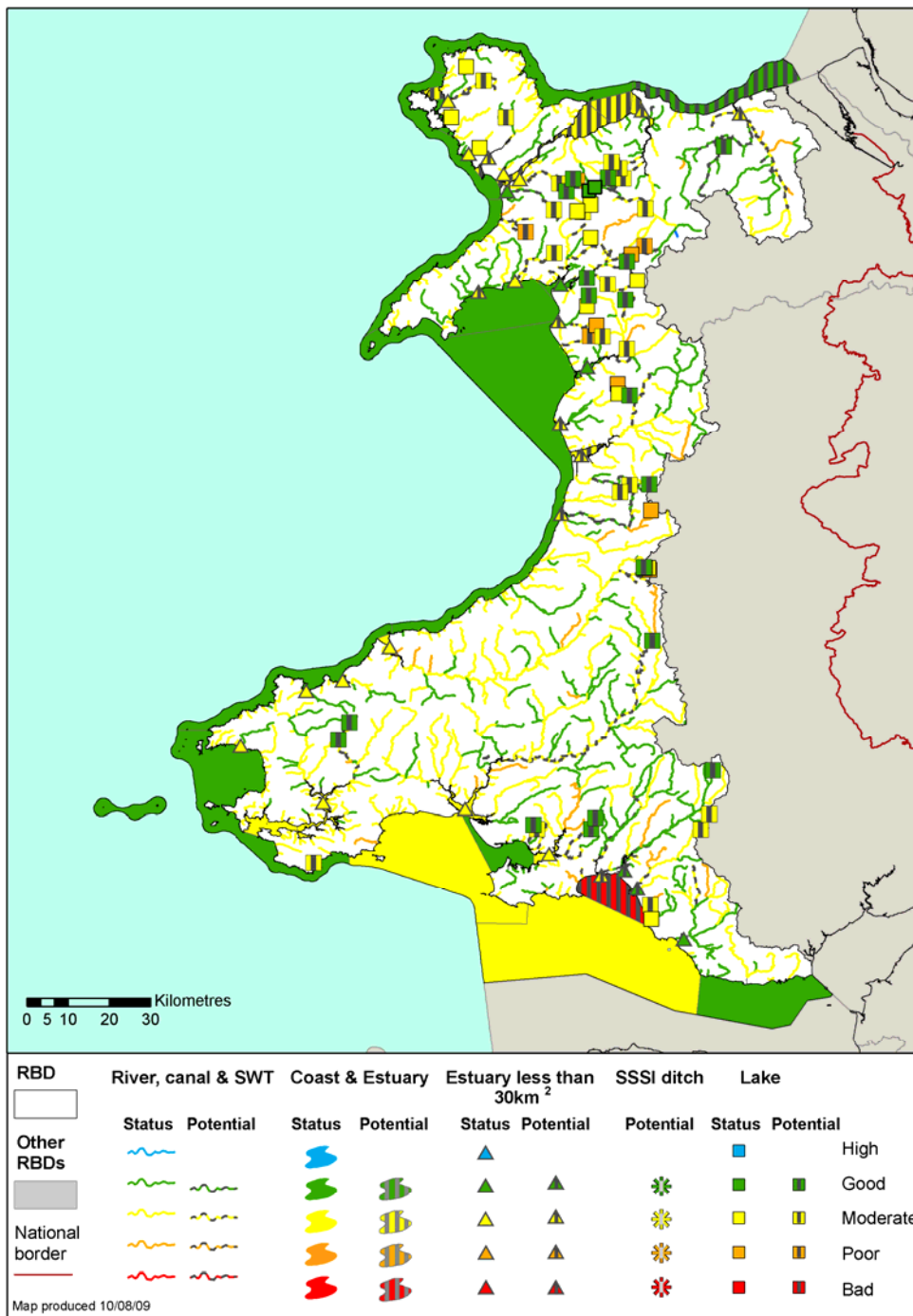
### Investigations – improving outcomes for 2015

In many cases the Environment Agency are not able to identify appropriate actions for water bodies that are currently not achieving good ecological status/potential. Sometimes this is because the cause of the problem and its sources are not yet known. Sometimes this will involve gaining corroborative evidence of biological problems to justify expenditure where there is low confidence of failure of chemical standards. In other cases the most appropriate solution to the problem needs to be researched. Investigations into these types of issues will be an important part of the programme of actions in this plan. Where possible, investigations will take place before 2013 so that the results are known in time for the formal review of this plan by 2015.



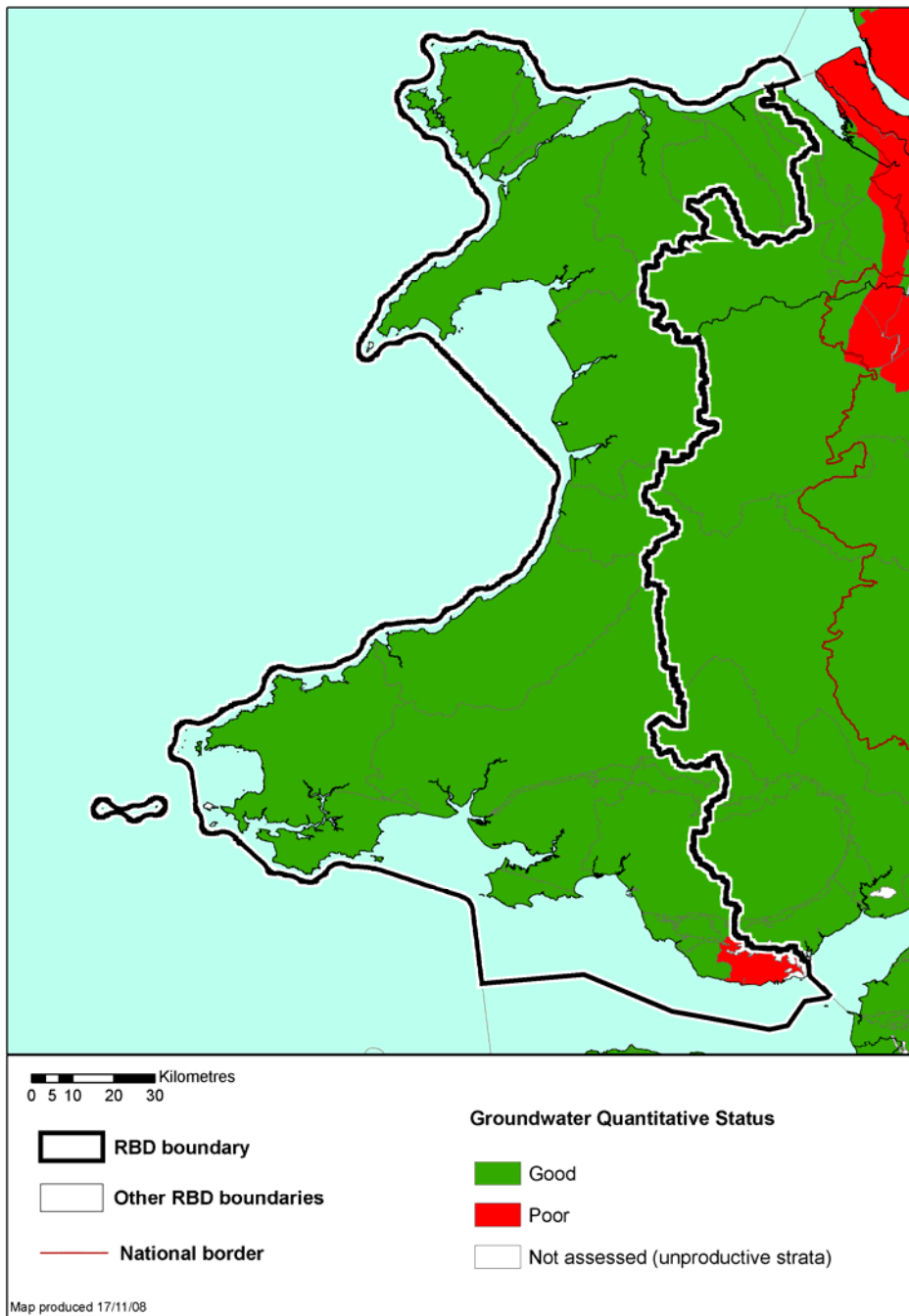
Across England and Wales there is a formal target of achieving 31 per cent of surface waters in good ecological status or potential by 2015. Improvement to the water environment has to be managed as a continuum, not in isolated six year cycles. The Environment Agency are already confident that in this river basin district 13 per cent of surface waters will be improved by for at least one element by 2015. We are also confident that a proportion of investigations will lead to action that we can put in place before 2015. To ensure we capture these additional opportunities, we will be ensuring that the Western Wales River Basin District makes its contribution to a goal of achieving up to 33 per cent of surface waters across England and Wales at good ecological status or potential by 2015.

Figure 9 Predicted ecological status and potential for surface water bodies in 2015



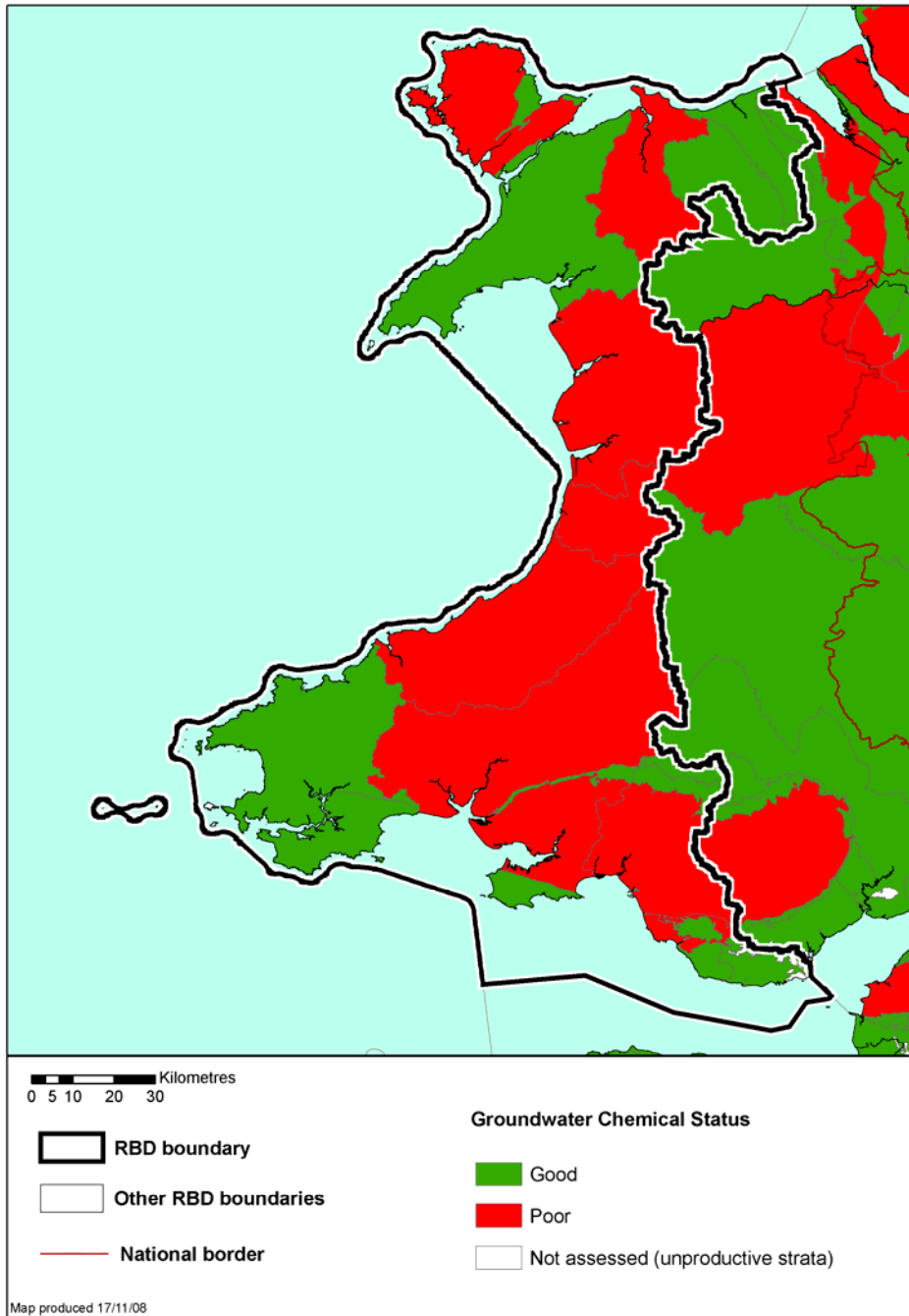
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Figure 10 Predicted quantitative status for groundwater in 2015



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Figure 11 Predicted chemical status for groundwater in 2015



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## 7 Targets for subsequent cycles

There are three river basin management cycles: 2009-2015, 2015-2021 and 2021-2027. Achieving good status in all water bodies by 2027 is a significant challenge.

The information gained from investigations during the first cycle will help to accelerate improvement to known issues using both traditional and novel techniques in both second and third cycles. New issues will arise though.

This plan sets out where good status cannot be achieved by 2015. This relates to 65 per cent of rivers, 68 per cent of lakes, 70 per cent of estuaries, 33 per cent of coastal waters and 40 per cent of groundwater.

In these cases an alternative objective of good status or potential by 2021 or 2027 is set (see Annex E).

Over the period to 2027, the pressures on the water environment will change, particularly because of climate change. It is not known in detail how the water environment will respond to this.

The population in the river basin district will continue to increase, with further urbanisation. Agriculture will respond to the changing climate both here and abroad, market conditions, financial incentives and regulatory pressures. Technology and other solutions to address the pressures will improve, but the rate at which some new solutions can be introduced will depend on the economic climate.

The Environment Agency believes that achieving good status in all water bodies by 2027 will not be possible using only current technologies. Even achieving 75 per cent good status will require marked changes in land use and water infrastructure, such as a major programme to separate foul and surface water sewers across most of the river basin district. By current standards, such changes are extremely unlikely to be economically or socially acceptable.

For some waters therefore, achieving good status by 2027 may not be technically feasible or disproportionately costly.

The Environment Agency wants to work with others to find and implement additional actions to improve the environment, with the aspiration of achieving good status in at least 60 per cent of waters by 2021 and in as many waters as possible by 2027.

The water environment now and objectives for 2015 are described further in the section '[Western Wales River Basin District catchments in 2015](#)'. A summary of the key statistics for the Western Wales River Basin District is provided in Section 10.

## 8 Western Wales River Basin District catchments

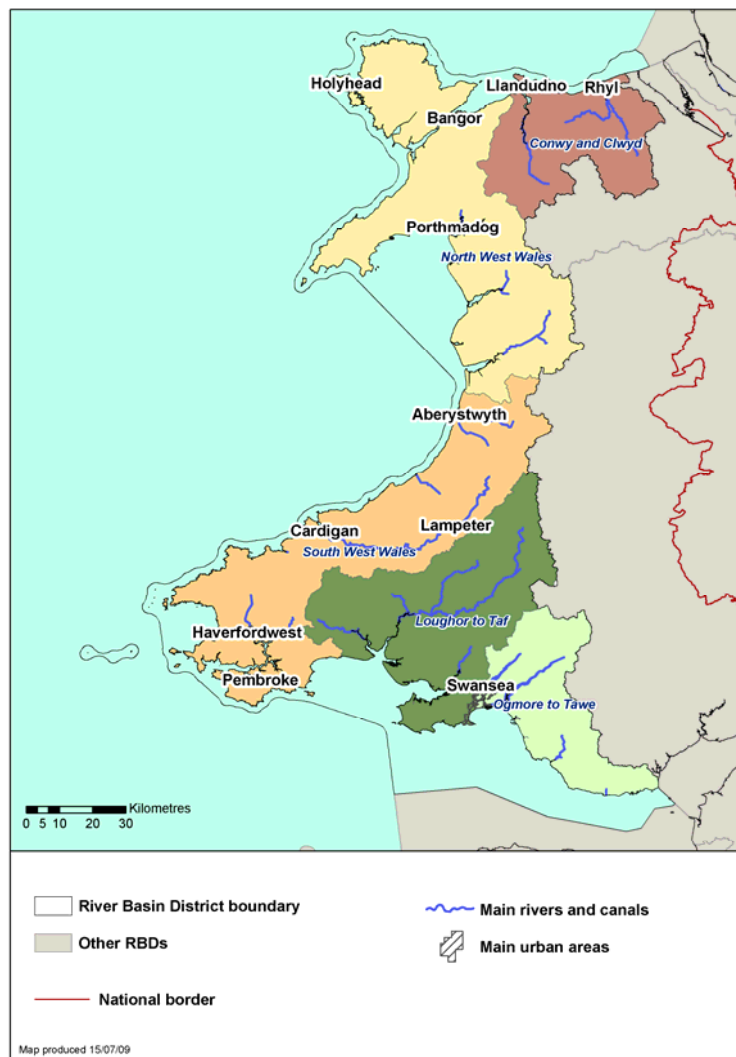
This section summarises information about the status of waters in the different parts of the Western Wales River Basin District, their objectives and some of the actions for them.

Rivers and lakes are grouped by catchment. There are 5 catchments, presented here from west to east. These are shown in Figure 12, below.

- [Conwy and Clwyd](#)
- [North West Wales](#)
- [South West Wales](#)
- [Loughor to Taf](#)
- [Ogmore to Tawe](#)

There are separate sections for [estuaries and coastal waters](#), and [groundwater](#).

Figure 12 **Map of the catchments in the Western Wales River Basin District**



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## Conwy and Clwyd



The Conwy and Clwyd are adjacent but distinct river systems flowing north into the Irish Sea on the North Wales coast.

Agriculture is the main land use, with sheep farming in the uplands, mixed livestock rearing and dairy lower down the catchments. Dairy is found lower down, sometimes still mixed with sheep and beef, while the broader valley floors of the Clwyd support some arable crops. There is forestry in both the Clwyd and Conwy catchments, including the Gwydyr Forest near Betws-y-Coed where there are also abandoned metal mines.

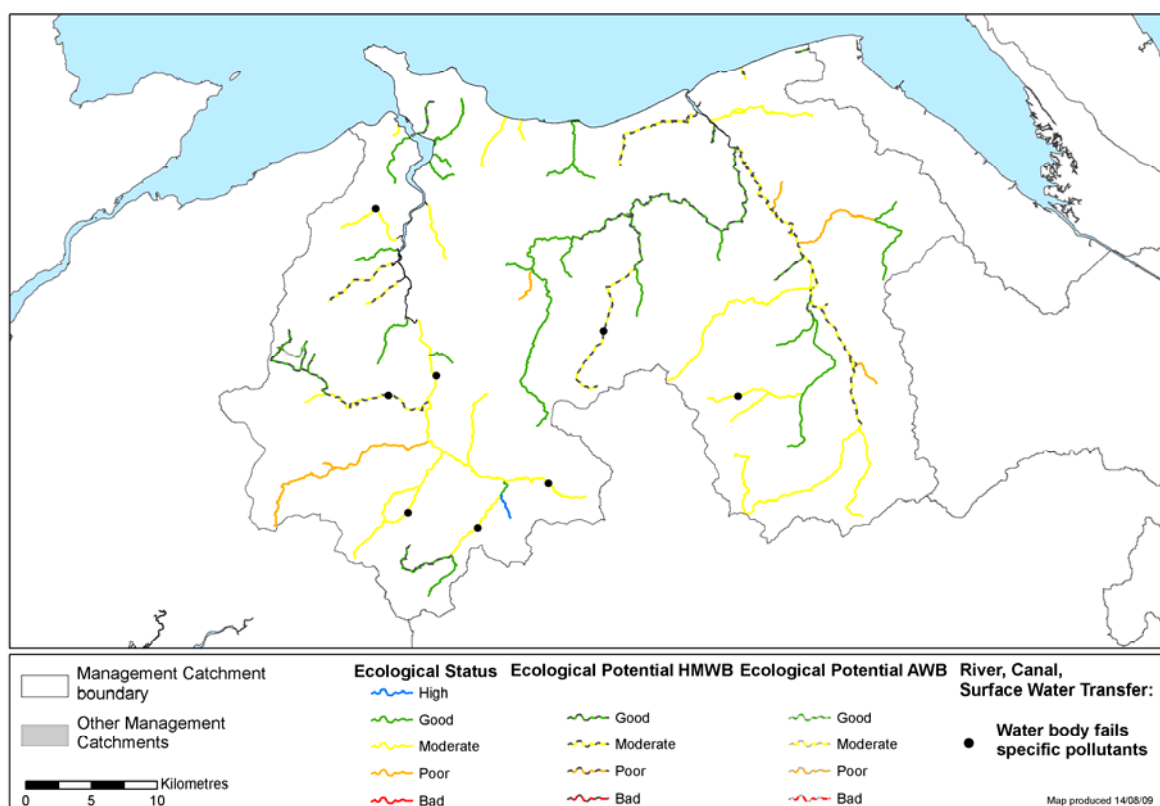
The area relies heavily on the tourism industry, with several EU designated bathing waters including Llandudno, Colwyn Bay and Rhyl. Faecal indicator organisms that affect bathing water quality come from diffuse urban inputs along the coastal strip and diffuse agricultural inputs further upstream, as well as sewage treatment works. Other industries include hydro-electric power generation, the largest scheme being at Dolgarrog in the Conwy, and some quarrying and fish farming in the Clwyd.

Public water supply is mostly from natural lakes that have been physically modified, although some of the coastal towns in the Clwyd are more dependent on groundwater sources. The main river Clwyd itself is supported by groundwater augmentation in times of naturally low flows.

The Conwy and the Clwyd are both important salmon and sea trout fisheries. Rural land management, manmade barriers to migration in the Clwyd and some investigative work all need to be addressed to further improve the fish status. Acidification is a pressure in upland parts of the Conwy, including Llyn Conwy. Ways to mitigate acidification issues to meet the target dates are being investigated.

The water quality and biology of the Clwyd is impacted by nutrients, from both sewage treatment works effluent and diffuse agricultural inputs.

Figure 13 Map showing the current ecological status/ potential of surface waters in the Conwy and Clwyd catchment



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Table 5 Key statistics for the Conwy and Clwyd catchment

River and lake water bodies	Now	2015
<b>% at good ecological status or potential</b>	49	58
% assessed at good or high biological status (39 water bodies assessed)	52	59
% assessed at good chemical status (3 water bodies assessed)	33	33
% at good status overall (chemical and ecological)	47	57
% improving for one or more element in rivers		13

There are 63 river water bodies and 9 lakes in the catchment. 16 rivers and 8 of the lakes are artificial or heavily modified. 52 per cent of rivers (174km or 40 per cent of river length) currently achieve good or better ecological status/potential, including the rivers Gyffin in the Conwy and the Meirchion and upper Wheeler in the Clywd. 52 per cent of rivers assessed for biology are at good or high biological status now, with 34 per cent at moderate biological status, 14 at poor and none at bad.

Local actions will address the key pressures in the catchment, and those waters in the worst state will be prioritised. Actions to improve ecological quality include upgrades to sewage treatment works and pollution prevention visits to identify and resolve issues threatening bathing water compliance, voluntary catch and release scheme for recreational fishing in the



Clwyd and investigation of liming proposals for the Upper Conwy. Some of this work will be done in partnership with the Clwyd and Conwy Rivers Trust. Initiatives are also underway to provide advice to farmers including the Environment Agency's ongoing Clwyd Catchment Initiative and the CEFN Conwy project on nutrient management managed by Bangor University. The Wales Metal Mine Strategy will also address minewater impacts in the catchment.

These actions are predicted to be enough to improve the biological status of 3 water bodies by 2015 and 13 per cent of rivers will improve for at least one element by 2015. For example the invertebrate classification in the Afon Ystrad will improve.

## North West Wales



North West Wales stretches west and south from the Conwy covering the island of Anglesey, the Llyn Peninsula and land draining to Cardigan Bay as far south as Borth. There are many separate river systems including, from north to south, the Ogwen, Seiont, Dwyrhyd, Mawddach, Dyfi and on Anglesey the Cefni, Alaw and Braint. Away from Anglesey and the Llyn Peninsula, much of the catchment lies within Snowdonia National Park.

Land use is dominated by agriculture, predominantly sheep farming in the uplands and Anglesey, mixed sheep and beef in the valleys and dairy on the Llyn Peninsula. There are extensive areas of forestry plantation including the Dyfi valley and Coed-Y-Brenin north of Dolgellau. Diffuse inputs such as sediments from both agriculture and forestry affect the biological quality of the catchment.

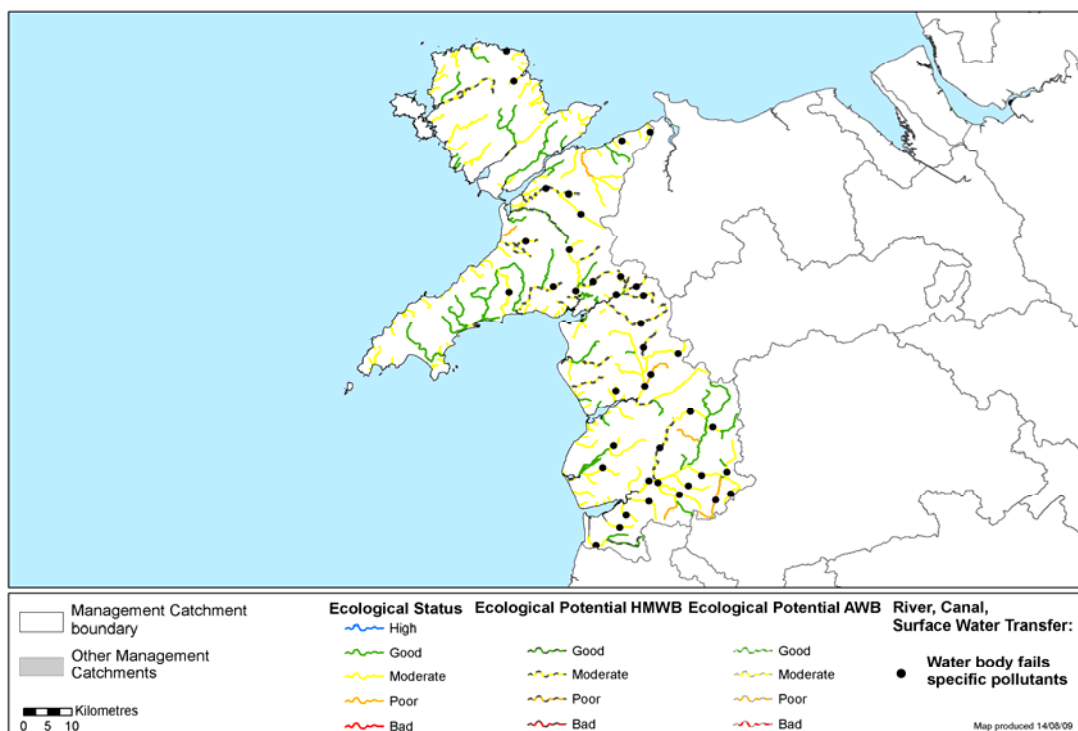
Many of the rivers support important salmon and sea trout fisheries. Good progress has been made in recent years easing barriers to migration for example removing woody blockages in the forestry in the Dyfi catchment and improving river habitats through creation of buffer strips.

The tourism industry is of huge economic importance to North West Wales. There are many EC designated bathing waters and opportunities for water based recreation including angling, sailing and canoeing. Faecal indicator organisms which affect bathing water quality come from diffuse urban and rural as well as point sources.

Historically, metal mining was an important industry in this part of Western Wales. A legacy of this still exists today with abandoned mines giving rise to elevated metal levels in rivers which sometimes directly affect ecological quality. This includes the Parys Mountain copper mine on Anglesey, Gwynfynydd gold mine near Dolgellau and Dylife mine, south east of Machynlleth.

There are many important conservation sites in North West Wales, including two riverine Special Areas of Conservation, the Afon Eden and the Afon Gwyrfai. Many lakes have been modified for public water supply, though a number of these are also Special Areas of Conservation. Acidification is a pressure on some upland rivers and lakes while on Anglesey a number of the lakes are impacted by nutrient enrichment.

Figure 14 Map showing the current ecological status/ potential of surface waters in the North West Wales catchment



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Table 6 Key statistics for the North West Wales catchment

River and lake water bodies	Now	2015
<b>% at good ecological status or potential</b>	26	30
% assessed at good or high biological status (92 water bodies assessed)	57	59
% assessed at good chemical status (14 water bodies assessed)	93	93
<b>% at good status overall (chemical and ecological)</b>	26	30
% improving for one or more element in rivers		10

There are 202 river water bodies and 33 lakes in the catchment. 26 rivers and 20 lakes are artificial or heavily modified. 25 per cent of rivers (350km or 31 per cent of river length) currently achieve good or better ecological status/potential, including the Dyfi upstream of Afon Twymyn, the Dwyfach and the Braint. 64 per cent of rivers assessed for biology are at good or high biological status now, with 27 per cent at moderate biological status. 27 per cent of lakes assessed currently achieve good or better ecological status/potential including Llyn Ogwen and Llyn Idwal. 30 per cent of lakes assessed currently achieve good or better biological status, with 43 per cent moderate and 26 poor biological status.

Local actions will address the key pressures in the catchment, and those waters in the worst state will be prioritised. Actions to improve ecological quality include initiatives to provide advice to farmers, pollution prevention visits to bathing waters to issues that threaten bathing water compliance and upgrades to sewage treatment works. Fisheries will continue to improve from poor and moderate towards good status by voluntary salmon catch and release for recreational angling in targeted rivers and liming of headwaters in the Mawddach

catchment. Under the Metal Mines Strategy, remediation options will be progressed at Parys Mountain and Dylife mine to reduce metal pollution. These actions are predicted to be enough to improve the biological status of 4 water bodies by 2015 and 9 per cent of rivers in North West Wales will improve for at least one element by 2015. For example the fish classification in the Afon Gwyrfa will improve.

### Case study 1 Working to improve fish and pearl mussel populations in the Afon Eden



The Afon Eden, a tributary of the Afon Mawddach near Dolgellau in mid-Wales, is home to one of the few viable populations of the freshwater pearl mussel left in Wales.

The life cycle of freshwater pearl mussels depends on salmon and trout. These fish are hosts for the larval mussels to grow and develop into juveniles before dropping off the host fish to establish in the river bed.

However the fish status of the Eden is currently at moderate under the Water Framework Directive. Investigations, including desk studies and additional biology, fish and water quality monitoring are underway

to understand the pressures on both the fish and mussel populations in the Afon Eden.

This work will help us understand what more we need to do to reach good ecological status for the Afon Eden and at the same time, is part of the work to achieve favourable conservation status for the freshwater pearl mussel and salmon under the Habitats Directive.

### South West Wales



The main river catchments in South West Wales, are the Rheidol, Ystwyth, Clarach, Teifi and Eastern and Western Cleddau. These are predominantly rural rivers and the land use is dominated by agriculture with sheep farming in upland areas and dairy, mixed livestock rearing and some arable farming in lowland areas. There is extensive land devoted to forestry in the headwaters of these catchments and abandoned metal mines are common here. There is a hydroelectric power scheme on the Rheidol.

The Teifi is one of the largest rivers in Western Wales and supports a diverse range of natural habitats and ecology. The Teifi flows through Cors Caron, an upland raised bog with a distinctive plant community and aquatic invertebrates unique to the area.

Many of the rivers in this area are productive and popular salmon, sea trout and brown trout fisheries. Angling and angling tourism is an important source of income to the local

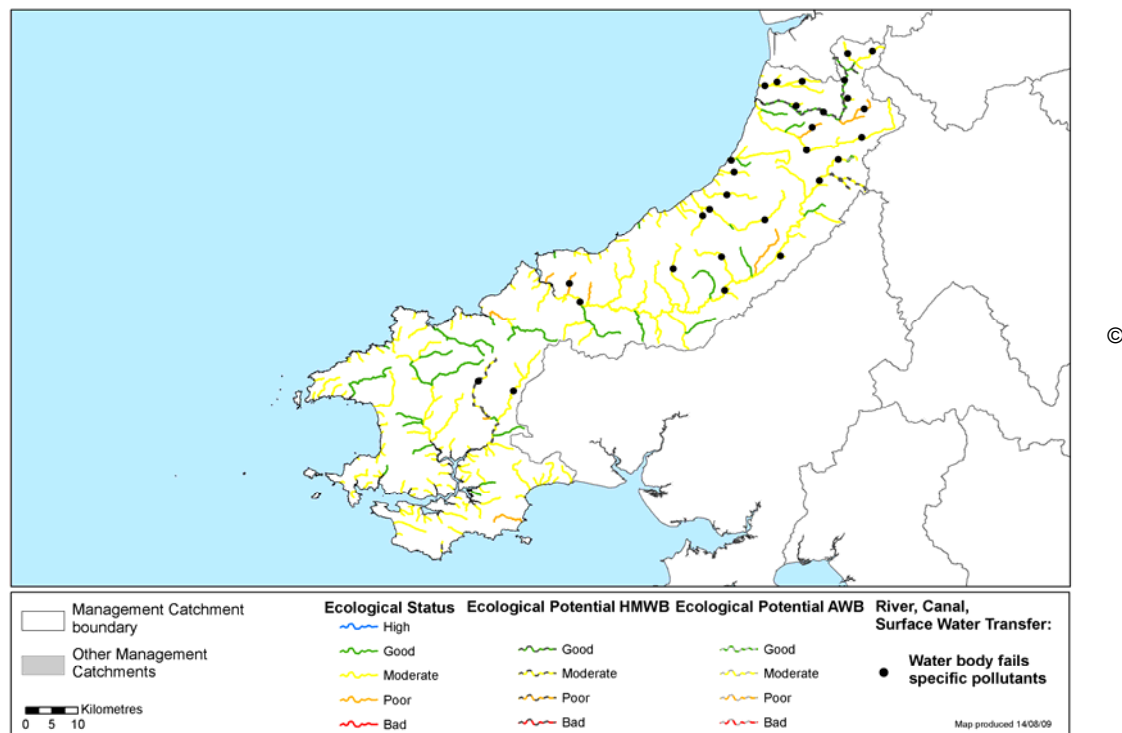
communities. Rural land management, pollution from metal mines and acidification all need to be addressed to further improve water quality, biology and fish status.

Historically, metal mining was an important industry in this part of Western Wales. A legacy of this still exists today with some mines giving rise to elevated metal levels in rivers which sometimes directly affect ecological quality. This includes Cwm Rheidol, and Cwm Ystwyth mines in Ceredigion.

The area has a high conservation and landscape value supporting a diverse range of important natural habitats. There are a number of designated sites including Special Areas of Conservation, Special Protected Areas, Sites of Special Scientific Interest and National Nature Reserves. Pembrokeshire Coast National Park is also included in this area.

The coastline is beautiful and varied with golden sandy beaches, cliffs and Milford Haven - one of the deepest natural harbours in the world. The area relies heavily on tourism and the improvement of bathing water quality is a priority. Faecal indicator organisms that affect bathing water quality come from rural and urban diffuse sources as well as point sources from sewage treatment works.

**Figure 15 Map showing the current ecological status/ potential of surface waters in the South West Wales catchment**



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## Case study 2 Working to improve ecological status of the Hirwaun



The Hirwaun is a tributary of the Teifi. It is a popular salmon and sea trout fishery and important spawning tributary. The Hirwaun's overall status is poor. This is driven by low fish populations, and the impact is likely to be as a result of rural diffuse pollution.

In response to the failing ecological status of the Hirwaun, a programme of measures consisting of extra investigatory physchem and biological monitoring has been established. Environment Agency ecologists will perform bankside biological assessments and farm pollution surveys to help identify the sources of the pollution.

Environment Management officers are reviewing the past data with desktop studies and agricultural catchment officers have been diverted to concentrate some of their work effort on this waterbody. The Catchment Officer's work will include walk-over surveys, farm visits to discuss best practice and pollution prevention work. These measures, as part of the Western Wales management Plan should provide improvement and allow us to meet good ecological status by 2015.

Table 7 Key statistics for the South West Wales catchment

River and lake water bodies	Now	2015
<b>% at good ecological status or potential</b>	17	22
% assessed at good or high biological status (100 water bodies assessed)	44	53
% assessed at good chemical status (10 water bodies assessed)	80	80
% at good status overall (chemical and ecological)	17	22
% improving for one or more element in rivers		13

There are 206 river water bodies and 10 lakes in the catchment. 6 rivers and 6 lakes are artificial or heavily modified. 16 per cent of rivers (182 km or 17 per cent of river length) currently achieve good ecological status/potential, including the rivers Nyfer in Pembrokeshire, and Groes and Creuddyn on the Teifi. 46 per cent of rivers assessed for biology are at good or high biological status now, with 45 per cent at moderate biological status, 10 per cent at poor and none at bad.

Local actions will address the key pressures in the catchment, and those waters in the worst state will be prioritised. Actions to improve ecological quality include agricultural catchment initiatives, which aim to resolve issues such as pesticides, sedimentation and nutrient input in rural areas. A programme of investigative field work will be undertaken on failing waterbodies and on and around failing bathing waters which will aim to establish sources of pollutants and resolve issues that threaten bathing water compliance and ecological status. Fisheries will be improved by removal of barriers to fish migration and habitat improvement work. Some of this work will be done in partnership with Afonydd Cymru and local rivers trusts. The Metal Mine Strategy for Wales will address minewater impacts in the catchment.

These actions are predicted to be enough to improve the biological status of 11 water bodies by 2015 and 13 per cent of rivers in South West Wales will improve for at least one element by 2015. For example the invertebrate classification in the Melindwr will improve.

## Loughor to Taf



The main rivers in this area are the Taf, Tywi, Gwyrdaeth, and Loughor. The area contains a wide variety of landscape types from well-wooded, steep valleys and low-lying river floodplains to the estuaries and coastal landscapes of Carmarthen Bay. The land use is predominantly agricultural with sheep farming in the uplands and mixed livestock rearing lower in the catchments. There is extensive forestry in the uplands. Urban areas and industry are limited.

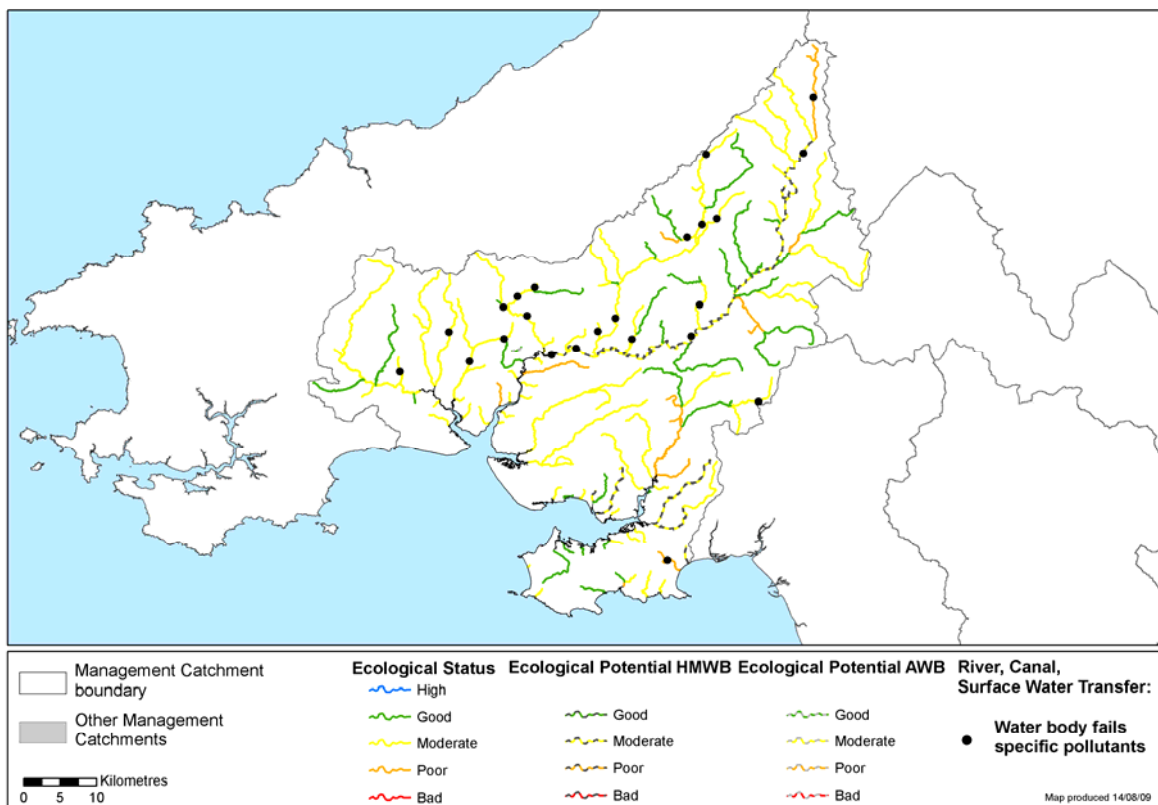
The main rivers are productive fisheries famous for salmon and sea trout. The Tywi is renowned as one of the premier sea trout rivers in the UK. These rivers attract large numbers of anglers both local and visiting which are important to the local economy. Rural land management, point source pollution and acidification all need to be addressed to further improve water quality, biology and fish status. Tidal reaches also offer good recreational and commercial sea fishing including licensed seine and coracle fisheries as well as shellfish beds. Investigations are underway to establish and resolve the issues surrounding the Burry Inlet cockle mortalities.

The headwaters of the rivers Tywi and Camddwr are dammed near the confluence of the Nant Brienne, and this forms Llyn Brienne reservoir. Water is not directly abstracted from the reservoir but is instead released into the Tywi to augment flows for abstraction for public water supply downstream. To help mitigate against the loss of natural spate flows, controlled releases in the spring encourage smolts to leave the river and in the late summer encourage salmon and trout to migrate up the river to spawn.

This area has exceptional ecological and conservation value and this is recognised in the numerous sites in the catchments that are designated as being of international, European, national and local importance. There are Special Areas of Conservation, Special Protected Areas, Sites of Special Scientific Interest a National Nature reserve and a Ramsar site.

Tourism is vital to the whole area and visitors are attracted by fishing, various outdoor recreations, and the diverse and picturesque landscapes that typify the area.

Figure 16 Map showing the current ecological status/ potential of surface waters in the Loughor to Taf catchment



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Table 8 Key statistics for the Loughor to Taf catchment

River and lake water bodies	Now	2015
<b>% at good ecological status or potential</b>	31	44
% assessed at good or high biological status (88 water bodies assessed)	43	56
% assessed at good chemical status (7 water bodies assessed)	71	71
<b>% at good status overall (chemical and ecological)</b>	31	44
% improving for one or more element in rivers		26

There are 126 river water bodies and 5 lakes in the catchment. 9 rivers and 5 lakes are artificial or heavily modified. 29 per cent of rivers (233km or 24 per cent of river length) currently achieve good ecological status/potential, including the rivers Bran, Cothi and Sawdde. 42 per cent of rivers assessed for biology are at good or high biological status now, with 44 per cent at moderate biological status, 13 per cent at poor and one water body at bad.

Local actions will address the key pressures in the catchment, and those waters in the worst state will be prioritised. Actions to improve ecological quality include agricultural catchment initiatives, which aim to resolve issues such as pesticides, sedimentation and nutrient input in rural areas. A programme of investigative field work will be undertaken on failing waterbodies and on and around failing bathing waters which will aim to establish sources of pollutants and resolve issues that threaten bathing water compliance and ecological status. Fisheries will be

improved by removal of barriers to fish migration and habitat improvement work and a strategy to reduce acidification impacts.

These actions are predicted to be enough to improve the biological status of 12 water bodies by 2015 and 26 per cent of rivers will improve for at least one element by 2015. For example the fish classification in the Doethie will improve.

## Ogmore to Tawe



The Tawe, Neath, Afan, Kenfig, Ogmore, Ewenny, Thaw and Cadoxton are the main rivers in this area. Heavy industry is located around the urban areas but the area as a whole is predominantly rural with much of the land area used for agriculture. Forestry dominates the upland areas.

The main urban developments and industrial areas are Swansea, Port Talbot, Neath, Maesteg, Bridgend, and Barry. The Neath catchment is dominated by its industrial past, which was based on coal mining and metal manufacturing. As part of this coal mining heritage, the catchment hosts two canal networks, the Neath canal and the Tennant canal. The Tawe is impounded by the Tawe barrage below its tidal limit.

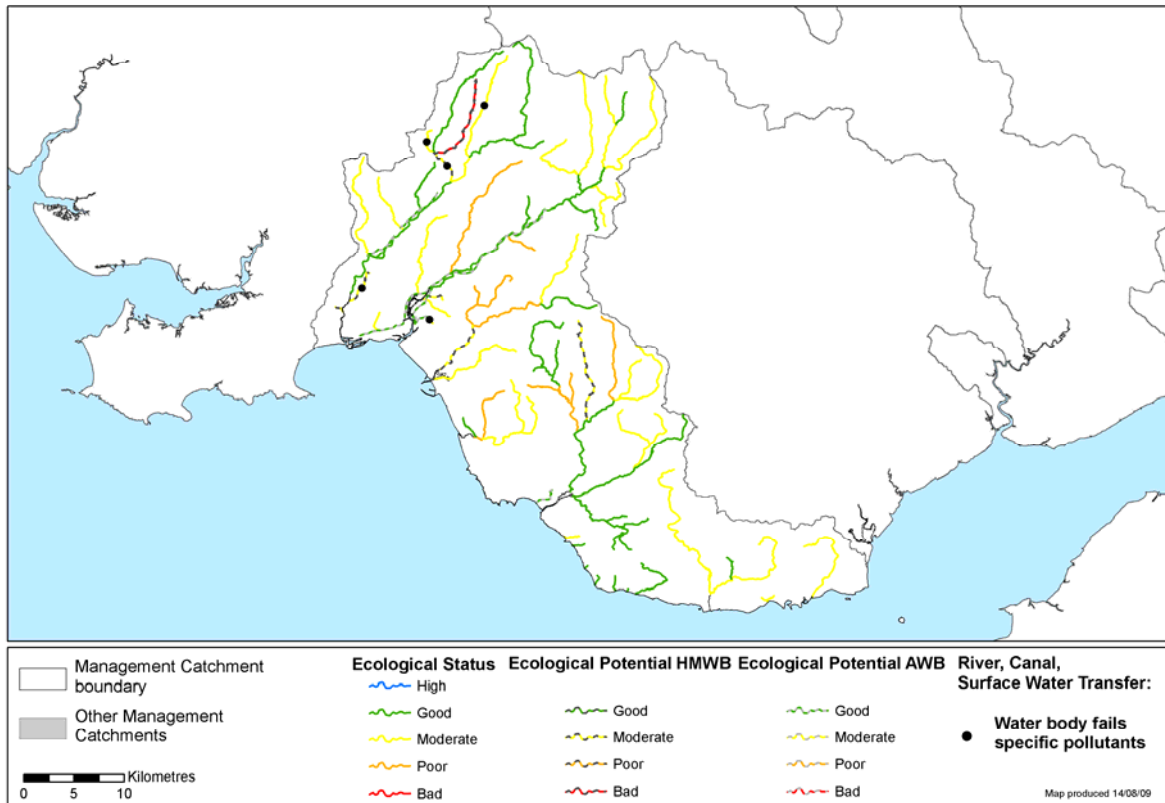
Many of the rivers towards the west of this area support good migratory and non-migratory fisheries. Artificial barriers to migration are prevalent in this area and mitigation work will be an important factor in improving fish passage and fish status. Rural land management, point source pollution, urban diffuse pollution, sedimentation and acidification all need to be addressed to further improve water quality, biology and fish status.

Tourism is vital to the area and visitors are attracted by fishing, various outdoor recreations, national parks and the many EU designated bathing waters that can be found along the varied coastline. Improving bathing water quality is a priority for the area. Faecal indicator organisms that affect bathing water quality come from rural diffuse pollution and in particular from urban diffuse sources as well as point sources from sewage treatment works.

The high conservation value and diversity of wildlife is reflected in the numerous designated sites. There are Special Areas of Conservation, Special Protected Areas, Sites of Special Scientific Interest and National Nature reserves, some of which are part of the Brecon Beacons National Park and the Gower Area of Outstanding Natural Beauty.



Figure 17 Map showing the current ecological status/ potential of surface waters in the Ogmore to Tawe catchment



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Table 9 Key statistics for the Ogmore to Tawe catchment

River and lake water bodies	Now	2015
<b>% at good ecological status or potential</b>	37	49
% assessed at good or high biological status (52 water bodies assessed)	40	57
% assessed at good chemical status (12 water bodies assessed)	75	75
<b>% at good status overall (chemical and ecological)</b>	34	46
% improving for one or more element in rivers		21

There are 71 river water bodies and 5 lakes in the catchment. 7 rivers and 4 lakes are artificial or heavily modified. 38 per cent of rivers (197km or 36 per cent of river length) currently achieve good ecological status/potential, including the rivers Afan, Nedd Fechan and Llancafarn. 40 per cent of rivers assessed for biology are at good or high biological status now, with 44 per cent moderate, 17 per cent poor and 2 per cent bad.

Local actions will address the key pressures in the catchment, and those waters in the worst state will be prioritised. Actions to improve ecological quality include a programme of investigative field work and pollution prevention visits to failing waterbodies in urban and rural areas and around failing bathing waters. This will aim to establish the sources of pollutants and resolve issues that threaten bathing water compliance and ecological status. Fisheries will be improved by removal of barriers to fish migration and habitat improvement work and a strategy to reduce acidification impacts.

These actions are predicted to be enough to improve the biological status of 9 water bodies by 2015 and 21 per cent of rivers in the Ogmere to Tawe will improve for at least one element by 2015. For example the invertebrate classification in the Gwys will improve.

## Estuaries and coastal water bodies



Conwy Bay

In Western Wales there are over 700 kilometres of coastline with 79 designated bathing waters and 25 designated shellfish waters. Much of the coastline is also protected under European conservation legislation for important marine species and habitats. The estuaries and coastal waters of the district are crucial to the economy of Wales through the coastal tourism industry and commercial fishing. There are major ports at Milford Haven and Holyhead and important commercial shell fisheries in the Burry Inlet (Loughor), Three Rivers (Tywi, Cywyn and Gwendraeth), Conwy and Menai Strait.

The main pressures on the estuaries and coastal waters of Western Wales include morphological alterations, nutrient and microbiological contamination from run-off and sewage, chemical contamination and potential over-exploitation of fisheries.

There are 27 estuaries and 24 coastal water bodies in Western Wales. 80% of assessed transitional and 95% of coastal water bodies are achieving good ecological status and potential. These include the Neath, Ogmere, Glaslyn and Mawddach estuaries, and North Wales and all three Cardigan Bay coastal water bodies.

**Table 10 Key statistics for estuaries and coastal waters in the Western Wales River Basin District**

Estuaries and coastal water	Estuaries		Coastal	
	Now	2015	Now	2015
<b>% at good ecological status or potential</b>	30	30	67	67
% assessed at good or high biological status (30 water bodies assessed)	80	80	95	95
% assessed at good chemical status (11 water bodies assessed)	100	100	100	100
% at good status overall (chemical and ecological)	30	30	67	67
% improving for one or more element		0		8

Actions to address these issues include managed realignments schemes to create more saltmarsh habitat, pollution prevention campaigns targeted at failing bathing waters and pre-season checks at bathing waters to improve compliance with the revised bathing waters directive.

## Groundwater



Groundwater is an important resource in parts of the Western Wales River Basin District. The main strategic aquifers include the Carboniferous Limestone in Pembrokeshire and the Permo Triassic Sandstone in the Clwyd catchment. Many properties in rural areas also rely on small springs and wells for private water supplies.

In Western Wales, contaminants from historic mining activity have had a significant local impact on groundwater and consequently surface water quality. Other pressures on our groundwater are abstraction for drinking water supply and contamination with nitrates.

There are 25 groundwater bodies defined in Western Wales. Our latest assessment shows that 96 per cent of these are meeting good quantitative status. Only one groundwater body, in the Thaw and Cadoxtan catchment, is currently at poor quantitative status because of the initial assessment of impact on surface water flows. Further investigation will be needed, starting with a detailed review of the conceptual hydrogeological model for these sources.

64 per cent of groundwater bodies currently meet good chemical status. Eight groundwater bodies fail because of their impact on surface water quality, mainly related to the impact from historic metal mining activity. One groundwater body fails due the impact it has on a groundwater dependent terrestrial ecosystem (wetland) .

Groundwater can take a long time to recharge from rainwater infiltration and to recover from the effects of pollution, even when that source pollution has been brought under control. For this reason we are proposing that by 2015 we will achieve 96 percent compliance for quantitative and 64 percent compliance for chemical status.

Action to address these issues include further pollution prevention to reduce the risk of groundwater pollution and actions to address nitrate pollution. The ongoing work on metal mine remediation through the Wales Metal Mine Strategy should reduce contamination of groundwater in the longer term. A programme of investigation into the perceived impact of groundwater quality on the status of the wetland referred to above is also underway.

Table 11 **Key statistics for groundwaters in the Western Wales River Basin District**

Groundwater	Now	2015
<b>% at good quantitative status</b>	96	96
% assessed at good chemical status (25 water bodies assessed)	64	64
% at good status overall	60	60

## 9 Next steps – implementing this plan

### Diffuse pollution investigation and action

In developing the River Basin Management Plans approximately 8,500 investigations have been identified for England and Wales, including further monitoring. The vast majority of these will be undertaken by the Environment Agency and all of these will be completed by the end of 2012. The investigations will focus on resolving what is causing the problem and what the best method to tackle it is. As a result of the evidence they will provide, we will be able to take further action in the first cycle where practicable.

The remainder of the investigations – including over 100 water company catchment management investigations – will be carried out by co-deliverers across England and Wales during the course of the first delivery cycle. Working with the river basin district liaison panels, the Environment Agency will welcome the input of local data and knowledge from other parties to help drive action at catchment level.

We are confident the investigation programme will lead to actions enabling a further reduction in diffuse pollution and more environmental improvement before 2015. As we have said earlier, the Environment Agency is already committed to delivering, through its own work or through working with others, an additional two per cent improvement towards good status or potential by 2015 across England and Wales

### Additional national measures

In addition to commitments already provided, the UK Government and Welsh Assembly Government will continue to demonstrate their commitment and bring forward significant work starting with;

- banning phosphates in household laundry detergents;
- a new requirement contained within the Flood and Water Management Bill making the right to connect to surface water sewers contingent on Sustainable Drainage Systems (SuDS) being included in new developments. Local authorities will be responsible for adopting and maintaining SuDS that serve multiple properties and the highways authorities will maintain them in all adopted roads;
- general binding rules to tackle diffuse water pollution by targeting abuse of drainage systems, potentially including industrial estates, car washes and construction by 2012;
- transferring the responsibility for misconnections to water companies by 2012;
- the Water Protection Zones Statutory Instrument which will enter into force on 22 December 2009 and will be used to tackle diffuse pollution where voluntary measures are not sufficient;
- more funding for the Catchment Sensitive Farming Delivery Initiative in England from 2010 – a 50% increase in capital grant spend, and evaluation of the initiative to ensure it is achieving maximum effectiveness;
- better targeting of agri-environment schemes for water protection. In Wales, this includes aligning the forthcoming “Glastir” agri-environment scheme to contribute towards meeting Water Framework Directive requirements;
- supporting the farming industry in the Campaign for the Farmed Environment, which has reducing impacts on water quality as one of its priorities;
- encouraging farmers to use buffer strips to reduce diffuse pollution through guidance and advice provided under cross compliance;
- better understanding of the impact of sediment and measures to tackle it as a result of the additional funding announced in June 2009;
- further consideration of the impact of cross compliance and good agricultural and environmental conditions (GAEC) on water quality;

- implementation of the Sustainable Use of Pesticides Directive;
- Environmental Permitting Regulations guidance setting essential standards of location, operation and maintenance for septic tanks.

These and the other actions in the plans will lead towards a greater achievement of good status and improvement within class, with more than a quarter of the length of all rivers improving.

### **Implementing the plans at catchment level**

The Environment Agency has found river basin liaison panels extremely valuable, and will continue to work with them throughout the plan delivery period. The panels will help to encourage river basin district-wide action through their sectors, monitor overall progress and prepare for the second cycle of River Basin Management Planning.

Given that implementation requires activity 'on the ground', it is essential that there is the maximum involvement and action from locally based organisations and people. Innovative ways of working together need to be identified that will deliver more for the environment than has been captured in this plan.

The Environment Agency will adopt a catchment-based approach to implementation that is efficient and cost-effective. This will support the liaison panels, complement existing networks and relationships, and enable better dialogue and more joined up approaches to action.

In some places there will be added value from adopting more detailed catchment plans to help deliver the River Basin Management Plan objectives during the planning cycles. The River Kennet is a case in point where we have set up a pilot group with a range of stakeholders. We will share the knowledge gained with the liaison panels, to help identify other catchments that could benefit from a similar approach.

### **Working with co-deliverers**

This plan sets out in detail the actions required to improve the water environment. All organisations involved must play their part, record their progress and make the information available.

Where the work of a public body affects a river basin district, that body has a general duty to have regard to the River Basin Management Plan. Ministerial guidance states that the Environment Agency should:

- work with other public bodies to develop good links between river basin management planning and other relevant plans and strategies, especially those plans that have a statutory basis such as the Local Development Plans and Wales Spatial Plan;
- encourage public bodies to include Water Framework Directive considerations in their plans, policies, guidance, appraisal systems and casework decisions.

For some, the actions in this plan may be voluntary and for others they will be required under existing legislation. We want to work with you to make these actions happen, and identify new action to create a better place.

### **Reporting on progress**

The Environment Agency will use its environmental monitoring programme and, where appropriate, information from other monitoring programmes, to review whether work on the ground is achieving the environmental objectives. We will update the classification status of

water bodies accordingly and review progress annually. At the end of 2012 a formal interim report will be published. This will:

- describe progress in implementing the actions set out in this plan;
- set out any additional actions established since the publication of this plan;
- assess the progress made towards the achievement of the environmental objectives.

Preparations have already begun for the next cycle period 2015 to 2021 and for the subsequent cycle to 2027. If you have proposals for actions that can be included in these future cycles please contact us.

### **River basin management milestones**

The plan builds on a number of other documents and milestones required by the Water Framework Directive. The work to date has ensured a strong evidence base, and a framework for dialogue with interested organisations and individuals. In terms of taking this plan forwards, it helps to understand the major milestones remaining. These future milestones are summarised in the figure below.

Figure 18 River basin management planning milestones to date and to 2015



## 10 Summary statistics for the Western Wales River Basin District

Table 12 Summary statistics for the Western Wales River Basin District

	Rivers, Canals and SWT's	Lakes and SSSI ditches	Estuaries	Coastal	Surface Waters Combined	Groundwater
% of water bodies with improvement in any status of any element by 2015	15	2	0	8	13	0
% of water bodies at good ecological status/potential or better now For groundwater: % of water bodies at good or better quantitative status now	28	32	30	67	29	96
% of natural water bodies at good ecological status or better now	28	11	53	78	28	96
% of artificial and heavily modified water bodies at good ecological potential or better now	28	42	35	33	33	N/A
% of water bodies at good ecological status/potential or better by 2015. For groundwater: % of water bodies at good or better quantitative status 2015	36	32	30	67	36	96
% of natural water bodies at good ecological status or better by 2015	36	11	53	78	36	96
% of artificial and heavily modified water bodies at good ecological potential or better by 2015	31	42	35	33	35	N/A
% of water bodies at good chemical status now	78	0	100	100	82	64
% of water bodies at good chemical status 2015	78	0	100	100	82	64
% of water bodies at good biological status or better now	49	33	80	95	51	N/A
% of water bodies at good biological status or better by 2015	59	33	80	95	59	N/A
% of water bodies with alternative objectives (good status 2021 or 2027)	65	68	70	33	64	40
% of waterbodies deteriorated under Article 4.7	0	0	0	0	0	0

% of all water bodies (surface waters and groundwaters) at good status now 30  
 % of all water bodies (surface waters and groundwaters) at good status by 2015 36



## 11 Further information – the annexes

- Annex A**      **Current state of waters in the Western Wales River Basin District**  
*What the waters are like now. Information on our network of monitoring stations, the classification status of water bodies and the reference conditions for each of the water body types in the river basin district.*
- Annex B**      **Water body status objectives for the Western Wales River Basin District**  
*Information on water body status and objectives*
- Annex C**      **Actions to deliver objectives**  
*Details of the actions planned (programmes of measures) for each sector to manage the pressures on the water environment and achieve the objectives of this plan.*
- Annex D**      **Protected area objectives**  
*Details of the location of protected areas, the monitoring network, environmental objectives and the actions required to meet Natura 2000 sites and Drinking Water Protected Area objectives.*
- Annex E**      **Actions appraisal and justifying objectives**  
*Information about how we have set the water body objectives for this plan and how we selected the actions. It also includes justifications for alternative objectives that have been set.*
- Annex F**      **Mechanisms for action**  
*More detail about the mechanisms (i.e. policy, legal, financial tools) that are used to drive actions.*
- Annex G**      **Pressures and risks**  
*Information about the significant pressures and risks resulting from human activities on the status of surface water and groundwater.*
- Annex H**      **Adapting to climate change**  
*Information on how climate change may affect the pressures on the water environment and the ability to meet the objectives.*
- Annex I**      **Designating artificial and heavily modified water bodies**  
*Information about the criteria used to designate waters as artificial or heavily modified water bodies.*
- Annex J**      **Aligning other key processes to river basin management**  
*Aligning planning processes to deliver multiple benefits and sustainable outcomes*
- Annex K**      **Economic analysis of water use**  
*Information about the costs of water services within the river basin district*
- Annex L**      **Record of consultation and engagement**  
*Details of how we have worked with interested parties to develop this plan*
- Annex M**      **Competent authorities**  
*List of the competent authorities responsible for River Basin Management Planning.*
- Annex N**      **Glossary**  
*Explanation of technical terms and abbreviations.*

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