Cyfoeth Naturiol Cymru
Natural Resources Wales

Lleyn and Eryri Management Catchment Summary

Contents

1. Background to the management catchment summary

This management catchment summary supports the current consultation on the updated river basin management plans. Along with detailed information on the Water Watch Wales website, this summary will help to inform and support delivery of local environmental improvements.

Natural Resources Wales has adopted the ecosystem approach. This means being more joined up in how we manage the environment and its natural resources to deliver economic, social and environmental benefits for a healthier, more resilient Wales. It means considering and regulating the environment as a whole, rather than dealing with individual aspects separately; weighing up and setting priorities for the many competing demands on our natural resources in a more integrated way. Partnership working is essential to achieve our ambition. By working together in this management catchment we will:

- understand the issues in catchments and how they interact
- understand how the issues are affecting the current local benefits and future uses of water
- involve local people, communities, organisations and businesses in making decisions by sharing evidence
- identify which issues to tackle as a priority.

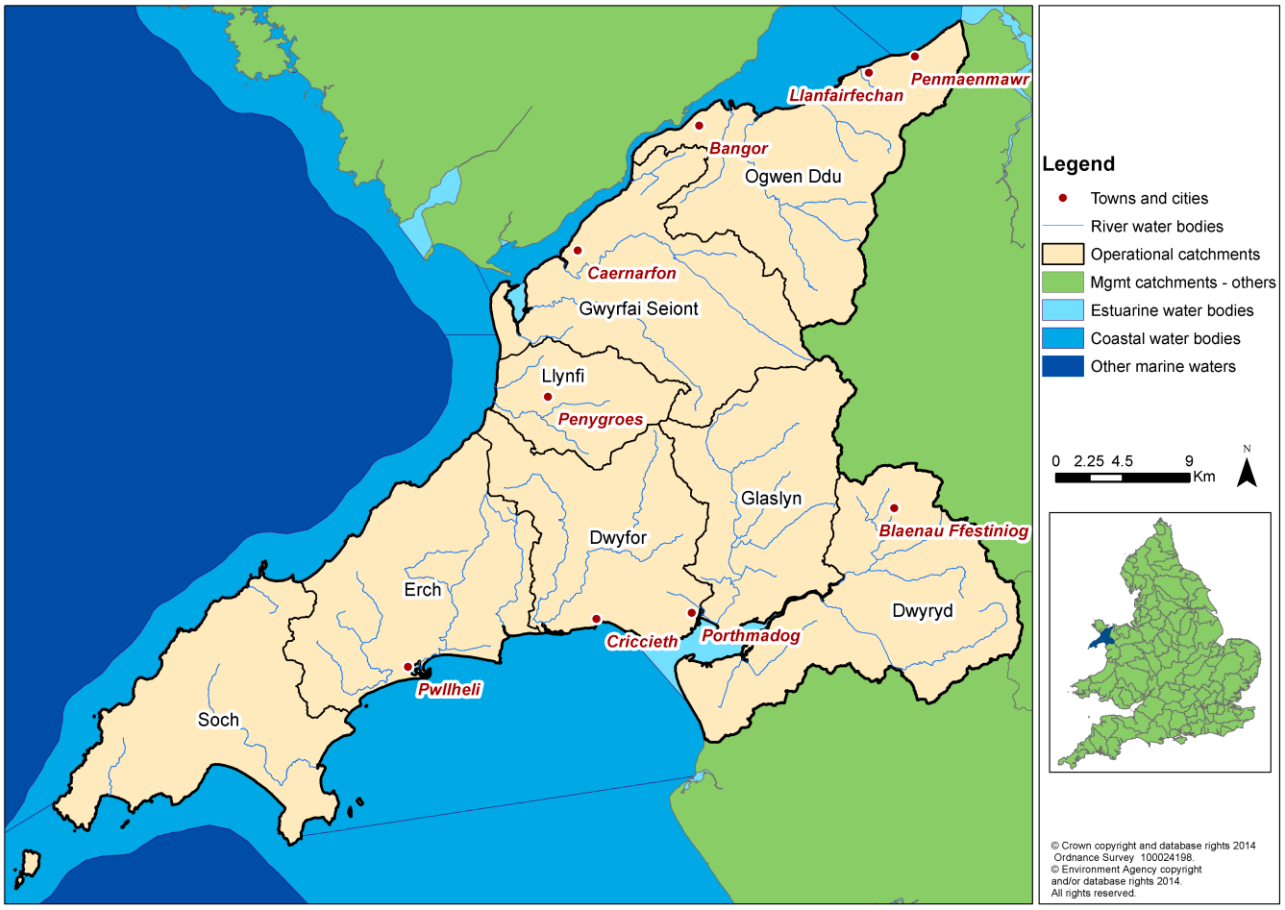
The Water Framework Directive provides a major overarching framework for river basin management. The Floods Directive sets out a strategic approach to flood risk management planning. A flood risk management plan has been produced for consultation in parallel to the river basin management plan and can also be found on our website. The flood risk management plan details how we propose to manage flood risk across the river basin district by prioritising those communities that are most at risk of flooding and detailing the measures we intend to take to manage their risk.

The flood risk management plan and the river basin management plan will shape important decisions, direct considerable investment and action, and deliver significant benefits to society and the environment.

As part of the consultation we are asking you for your input on priority opportunities and how we can make these summary documents as useful and relevant to the management catchment as possible. Within the river basin management plan consultation documents are a number of consultation questions; these will provide a useful starting point to gather your ideas in order to improve not only this document but partnership options to ensure that we work together to provide the best environmental options. We encourage you to look at the river basin management plans and respond to the consultation questions which you can find on our website.

2. The Lleyn and Eryri Management Catchment

Figure 1. Lleyn and Eryri Management Catchment map



The Lleyn and Eryri catchment covers the Lleyn Peninsula, extending south east to the Glaslyn estuary and north eastwards to Dwygyfylchi and Snowdonia. The eastern half is mountainous upland, dominated by sheep farming. Further west on the low lying land of the Lleyn Peninsula, dairy farming is more common. Outside of Bangor, Caernarfon and Porthmadog, the population is generally scattered in small towns and villages.

There are several EU bathing waters around the coastline and commercial shellfish waters along the Menai Strait. Tourism is of great economic importance to the area and maintaining the quality of coastal waters and inland rivers is a high priority. There are also many inland sites designated for conservation and biodiversity purposes, as well as Snowdonia National Park, which are important in attracting tourists to the area.

In February 2014 a Lleyn and Eryri management catchment workshop was held at Plas Tan Y Bwlch, Maentwrog. During this event the benefits of the catchment were captured. These included:

- Energy - hydropower & other sustainable energy development
- Biodiversity - designated sites & species e.g. Freshwater pearl mussel, Pen Llŷn a'r Sarnau & Corsydd Llŷn SAC through to local wildlife trust reserves
- Outstanding landscape and natural heritage - e.g. coastal geomorphology, lakes, river torrents and waterfalls
- Flood management – coastal
- Migratory fish - salmon, sea trout and eels

- Food production - sheep, beef and dairy, and also the importance of agriculture to economy of area
- Recreation and tourism - important for local economy e.g. coastal footpath, marinas such as Pwllheli, bathing waters, fishing
- Environmental education at all levels
- Water - public water supply
- Forestry - multiple benefits including timber, carbon storage, biodiversity, employment

Natural Resources Wales continues to work in partnership with a range of partners and sectors in innovative ways so that we can achieve even more together. A flavour of some of the projects that have been delivered within this management catchment over the last 3 years together with projects in development are included below:

Table 1. Partnership projects in the management catchment

Project Name	Project Description	Partners	Funding sources
Loving our Lake	Community engagement and habitat improvement project to improve water quality at Llyn Padarn.	Snowdonia Active, DCWW	WFD TSO Fund,
A Snowdon Stream	The social enterprise Antur Waunfawr is restoring stream habitat on the Afon Gwyrfai.	Antur Waunfawr	WFD TSO Fund.

Case study. Loving our Lake – improving water quality and ecology of Llyn Padarn

'Loving our Lake' is a project to encourage those who live, work or holiday in the Llanberis valley to take small steps to help improve and protect Llyn Padarn and its wildlife.

This work followed the 2009 algal bloom which caused the lake to be 'off limits' for much of the summer and affected local businesses, wildlife, and people who could no longer enjoy the lake. The bloom was caused by a combination of weather conditions and nutrients such as phosphorus entering the lake.

Loving our Lake started by talking to local residents and businesses and was followed by a series of community events and activities to raise awareness and spread the word. The project is funded by Dŵr Cymru Welsh Water and has the backing of Natural Resources Wales. The project has been developed and delivered by Snowdonia-Active, a social enterprise based in Brynrefail.

Recent events have included litter picks and 'Winter Rubbish Walk, Paddle and Swim'. In June 2014 173 children from local schools took part in the Llyn Padarn Biodiversity Show in the Canolfan, Llanberis; learning how and why they should love Llyn Padarn.

Youngsters from the litter clean-up who are 'Loving our Lake' but not the wellies! Photo credit 'Ray Wood © 2013'

2.1 Key facts

We use the term water bodies to help understand and manage the water environment. A water body is part, or the whole, of a river, lake, ground water or coastal water. The number and type of water bodies in the management catchment is shown in the table below.

Table 2 Number and type of water bodies.

Number of water bodies	Natural	Artificial	Heavily Modified	Total
River*	**34**	**0**	**11**	**45**
Lake	**6**	**0**	**11**	**17**
Coastal	**4**	0	**2**	**6**
Estuarine	**4**	0	**2**	**6**
Groundwater	**4**	0	0	**4**
Total	**52**	**0**	**26**	**78**

*River water bodies includes canals and surface water transfers

There are areas in the catchment where the water environment is recognised as being of particular importance, including rare wildlife habitats, bathing waters or areas around drinking water sources. These areas are known collectively as protected areas and are detailed in the table below.

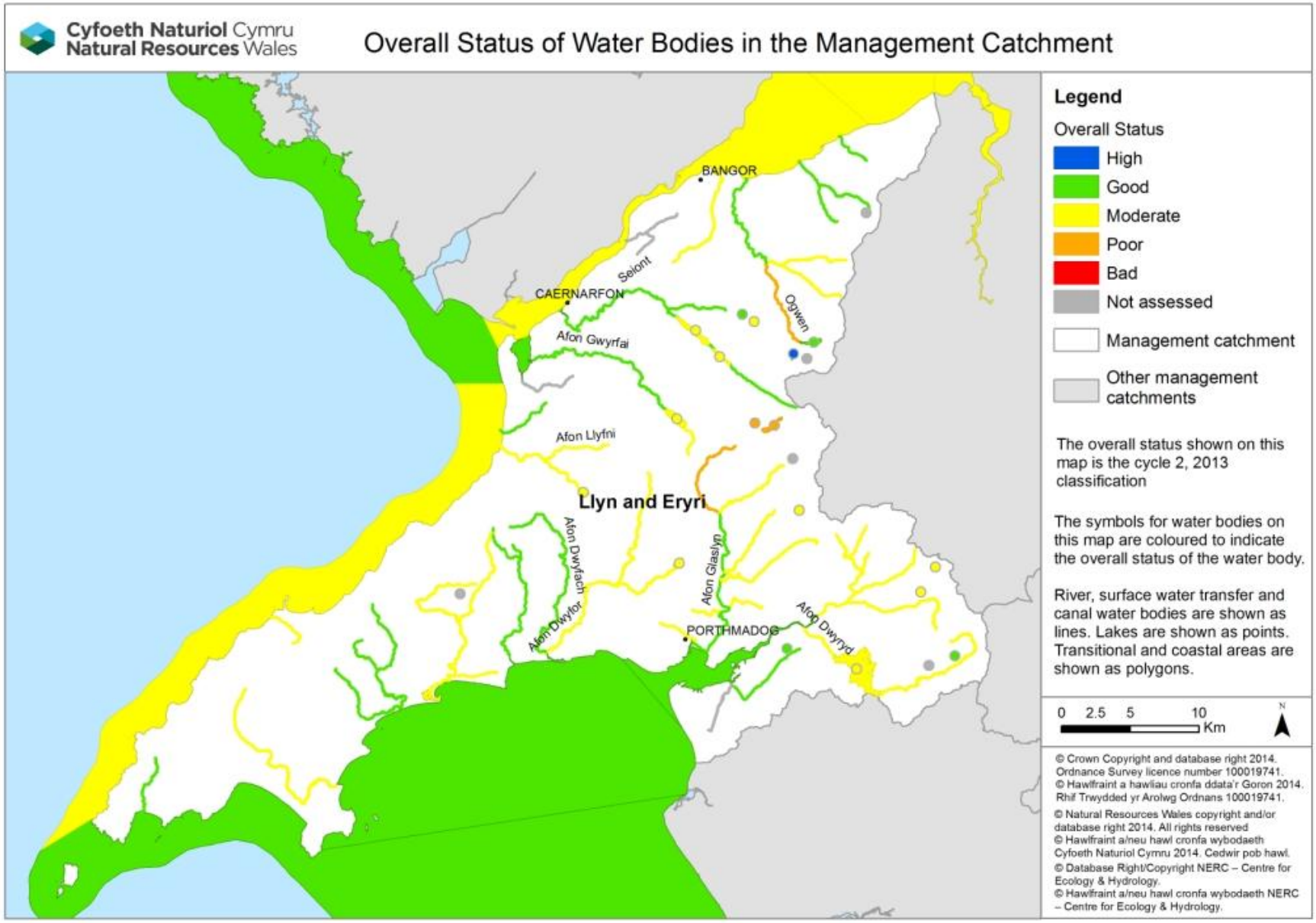
Table 3. Number and type of protected area

Protected Area	Number
Bathing Waters	**10**
Shellfish Waters	**2**
Water dependent Special Areas of Conservation (SACs)	**16**
Water dependent Special Protection Areas for Wild Birds (SPAs)	**5**
RAMSAR sites	**2**
Drinking Water Protected Areas	**15**
Nitrate Vulnerable Zones	**0ha**
Urban Waste Water Treatment Directive - Sensitive areas	**0**

3. Current Status of the water environment

We assess the condition of water bodies through monitoring which produces an annual classification. The current status for each water body is shown in figure 2. Note, since 2009, we have updated some of the systems we use to classify water bodies, including changes to some standards and water body boundaries.

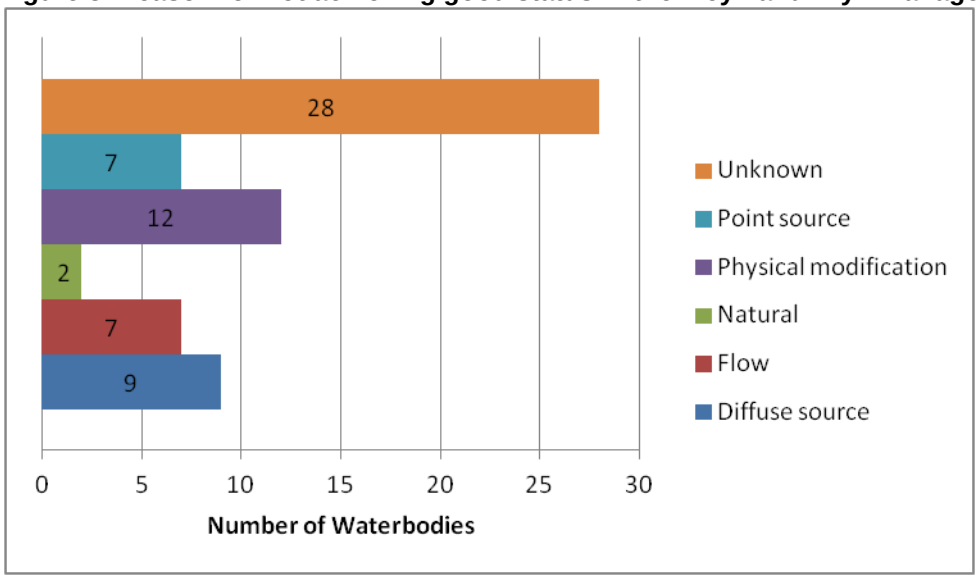
Figure 2. The current status of the Lleyn and Eryri Management Catchment (new building blocks, interim 2013 classification)



4. The main challenges

We have carried out a programme of investigations to better understand the causes as to why water bodies are failing to meet the required standards. The results of our findings are summarised in Figure 3.

Figure 3. Reason for not achieving good status in the Lleyn and Eryri Management Catchment



Reasons for not achieving good status include:
Bacteria from waste water treatment pose a risk of bathing and shellfish waters failing to meet EC quality standards. Work to identify and if necessary reduce the impact of physical modifications for water supply and hydropower is underway at sites including Cwmystradllyn, Llyn Cwellyn, Llyn Trawsfynydd and Llyn Llydaw. Abandoned metal and slate mines are causing impacts to a number of water bodies in the area. Rivers in the Blaenau Ffestiniog area have elevated metals and also experience sediment flushes in heavy rainfall. Acidification due to atmospheric deposition is identified as a problem in upland water bodies in the east of this area such as Llynnau Gamallt and Llyn Llagi. Acidification can cause toxic metals to leach out of the soils and enter watercourses, which can cause problems to aquatic organisms. Nutrients from sources including agricultural land management, urban diffuse pollution and discharges from wastewater treatment are identified as a problem in some rivers and lakes including Llyn Padarn and the Afon Cegin near Bangor.

3.3 Workshop feedback on issues

We need to work together to ensure the overall aims of the Water Framework Directive are met. In order to work together effectively we need to agree on the issues and solutions. The following section includes some of the issues that were raised as part of the catchment workshop; however it is not a full list. All of the comments received will be taken into account and the following is just a flavour of these comments.

- More connectivity of rivers
- Important to maintain work done so far e.g. on Lleyn fens
- Need to share information
- Invasive non-native species
- Further water quality improvements required to enhance salmon and sea trout populations

- More effective working with Local Authorities needed
- Improved riparian management needed
- Ongoing concerns about Llyn Padarn nutrient enrichment and arctic char populations
- Effective hydropower development
- Coastal erosion and flooding
- Flooding in general
- Water quality impact of nutrients and chemicals

5. Objectives and measures

This section outlines what we are aiming to achieve and the proposed new measures that need to be put in place. We aim to develop a single integrated programme of measures by 2021 that meets Water Framework Directive objectives:

- **Prevent deterioration in status**

Water body status will not be allowed to deteriorate from the current reported status.

- **Achieve the objectives for protected areas**

Achieve the standards set by the relevant directive under which they were designated. For water dependent Natura 2000 sites we will aim to achieve conservation objectives, achieving good status by 2021 is a milestone towards this objective.

- **Aim to achieve good overall status for surface and ground waters**

Implement measures to achieve good overall status where they are technically feasible and not disproportionately costly.

5.1 Measures

We have reviewed the reasons why water bodies are failing to achieve objectives and identified potential measures .Measures are divided into two groups. National measures apply to the whole of Wales, or the United Kingdom. In general these set the legislative, policy or strategic approach. Examples include a national ban on using a particular chemical or a national strategy for prioritising and funding the remediation of abandoned mines. Local measures are specific to the river basin district or a part of it. For example, the removal of invasive plants along a length of designated river or a local campaign targeting misconnections across an industrial estate. Many of the actions listed will also have multiple benefits. For example, sustainable urban drainage (SuDs) schemes help to reduce urban pollution, sewage pollution and changes to water levels.

A list of all national measures, both new and existing, and the local measures at the water body scale are detailed on Water Watch Wales. If you know about any others or want to suggest new measures, please tell us in your response to the consultation. The river basin management plan will become a statutory document hence the importance of ensuring that the correct measures are identified through this consultation.

The table below summarises the local measures for the management catchment, including those identified for protected areas. The high level categories describe the types of action required and broadly the options that are available, including voluntary and regulatory measures. At the local scale some of the options described might not be considered appropriate. There is overlap between some categories.

Table 4. Summary of local measure for the management catchment

Measure	Description	No. of water bodies
Acidification restoration	Emissions controls and upland restoration: blocking drainage, restoring blanket bog, within forestry plantation blocking forest drains and establishing native trees within the riparian zone, liming options. Some overlap with "address air pollution".	3
Address air pollution	Emissions controls to reduce nitrogen and acidic deposition.	14

Measure	Description	No. of water bodies
	Some overlap with "acidification restoration".	
Address point source pollution	Investigate and regulate pollution from point sources. Overlaps with "reduce pollution from sewage discharges" and "other waste water discharges".	14
Appropriate coastal process and sediment management	Measures to protect and restore integrity of dune systems	3
Complete first cycle investigation	All ongoing WFD investigations from first cycle programme.	27
Drainage and water level management	Investigate and implement changes to land drainage regimes and structures to restore water levels.	28
Dredging and silt management	Includes reducing siltation at source through land management, and implementing sustainable dredging and silt disposal regimes.	5
Improve fish passage and habitat	Remove or modify barriers to fish passage	6
Improve flows and water levels	Reduce impacts of regulated flows and abstractions, restore more natural flow regimes, implement options to improve water levels, such as water efficiency and recycling measures, alternative sources and supplies.	15
Manage invasive non-native species	Eradication and/or management of invasive non-native species in line with current national invasive species Action Plans. Includes biosecurity good practice, such as "CHECK-CLEAN-DRY" and Be Plant Wise.	32
Mine water and contaminated land remediation	Coal and metal mine, and contaminated land remediation - including passive and active mine water treatment, capping of spoil, removal of wastes to landfill, and channel diversion	6
Mitigate impacts of flood and coastal defences	Reduce impacts of flood defence structures and operations - improve connectivity, habitat, and morphology by implementing options through capital and maintenance programmes, such as soft engineering, opening culverts, upgrading tidal flaps, changing	15

Measure	Description	No. of water bodies
	dredging and vegetation management. Includes the national habitat creation programme to address coastal squeeze.	
Mitigate impacts of shipping, navigation and dredging	Assess and implement options for adapting dredging regimes and reducing the impacts of physical modifications.	4
Mitigate impacts of water resource impoundments	Assess and implement options for improving fish passage and habitat.	2
New Investigation	Includes investigations for all new failures, deterioration, and drinking water protected areas.	51
Other sustainable land and marine management practices	Includes measures to mitigate impacts from construction and maintenance of infrastructure, including within military training sites.	3
Reduce impacts of other physical modifications	Improve connectivity, habitat and morphology through soft engineering and restoration techniques.	1
Reduce pollution from other waste water discharges	Reduce pollution from other (non-sewage) point sources, both regulated and unregulated. Investigate and implement basic pollution prevention measures, including provision of up to date advice and guidance, such as correct handling and storage of chemicals and waste, management of trade effluent, and regulation.	3
Reduce pollution from septic tanks	Target actions to ensure septic tanks are maintained correctly. Where necessary issue formal works notices to owners to relocate or replace tanks and soakaways.	2
Reduce pollution from sewage discharges	Reducing pollution from continuous and intermittent discharges, includes additional treatment at sewage treatment works (e.g. phosphate stripping), investigating and tackling sewer blockages, and implementing sustainable drainage to reduce surface water drainage to sewers.	4
Specific habitat and feature works	Restoration and/or conservation of specific habitat and features,	24

Measure	Description	No. of water bodies
	including natural (e.g. caves, geological outcrops) and human structures (e.g. bridges, ruins).	
Sustainable access and recreation management	Reduce the impacts of erosion, disturbance and damage from both water-based and terrestrial access, including tackling illegal off-roading.	42
Sustainable agricultural practices	Implement basic and additional measures such as correct management of slurry, silage, fuel oil, and agricultural chemicals; clean and dirty water separation; nutrient management planning; buffer strips and riparian fencing; cover crops and soil management. In N2k sites changes to grazing regimes may be required, includes scrub management.	52
Sustainable fisheries management	Includes measures for both freshwater and marine fisheries to reduce and mitigate impacts	10
Sustainable marine development	Includes off-shore energy developments, such as oil and gas exploration and tidal energy.	3
Sustainable woodland and forestry management	Restore the riparian zone, disconnect forest drains, monitor the effectiveness of the 5 principle risks associated with forestry and use forestry and woodland to reduce diffuse pollution.	26
Tackle misconnections and urban diffuse pollution	Investigate and solve misconnections to surface water drains (at residential and commercial properties) and implement sustainable drainage schemes (SuDS) to reduce diffuse pollution.	1
Waste management	Includes appropriate management of spoil and sludge, illegal fly-tipping and litter	12
Total		**411**

Some examples of actions that are already under way in the Lleyn and Eryri management catchment include:

- Private dischargers are tackling diffuse pollution to minimise pollution reaching the beaches around the Lleyn and northern coastline.
- Welsh Water is monitoring the performance of their assets to focus investment in improvements.

- Quarry operators in the Blaenau area are working to reduce pollution. Improvements have been made to onsite drainage and management of runoff, and this has helped reduce polluting emissions in to the Goedol catchment, including the Afon Barlwyd.
- Natural Resources Wales is improving forest management to reduce the impact of acidification and protect rivers from sediment
- The Afon Ogwen was damaged by drainage and canalisation in the 1960s, today; extensive restoration has restored fish and invertebrates to the river and removed unsightly rubble that was lining a kilometre of the river bank within the National Park.
- Natural Resources Wales has worked with partners on the Wen, Cegin, Ogwen – lower, and Caseg water bodies as part of our focus during the first river basin cycle.

5.2 Workshop feedback on solutions

Concerns on current status raised at the workshop have been highlighted in Section 3, solutions and priorities were also discussed. Of the issues raised on the day, the following were flagged as priorities:

- **Diffuse pollution from rural land management - sediment**
  Proposed solutions include: Encourage good practice, Incentives to encourage wider buffer zone, improve Glastir, change single farm payment so not penalised by having buffer strip, this would help protect the most productive parts of land. From forestry, block some of the drainage to slow down the flow of water.
- **Invasive non-native species**
  Proposed solutions include: Continue to trap mink, more education required about the issues, use recreational help available to clear invasive plants, needs a catchment scale partnership response but also need to understand the problem areas.
- **Effective hydropower development**
  Proposed solutions include: Identify "no go" or high risk areas, ensure collaboration with stakeholders (new guidance), consider join consenting and planning process
- **Impacts of coastal erosion/flooding**
  Proposed solutions include: More joint working between Local Authorities and NRW, consider where managed retreat and no active intervention may be appropriate. Integration of Shoreline Management Plans required, need to manage changes within the local community, WG decisions needed and a compensation fund.
- **Water quality impact of nutrients and chemicals**
  Proposed solutions include: Continue work to improve infrastructure for sewage treatment, where required take enforcement action and don't just use warnings.
- **Flooding**
  Proposed solutions include: Increased community engagement to explain roles and reduce negative attitude to government agencies, monitor Local Development Plans (LDPS) for plans to build on flood plains, slow down water flows from catchments by ditch blocking and peat restoration in the uplands.

5.3 Alternative objectives

We have identified a small number of water bodies where because of the nature of the problem or the required measures we propose an extended deadline or less stringent objective (less than good). In each case we have provided a justification.

Table 5. Proposed alternative objectives and justifications

Alternative objective	Justifications	Number of water bodies	Water body
Extended deadline	Natural conditions – recovery time from acidification	5	Llynnau Gamallt Llyn Llagi Llyn Cwm Dulyn Colwyn Cynfal
Less stringent objective	Technically infeasible - minewater scheme	1	Llyn & Eryri groundwater
	Technically infeasible – ubiquitous and persistent chemical	1	Dwyfawr - lower

5.4 Opportunities for partnerships

There are several external funding opportunities, which could support projects that contribute towards Water Framework Directive outcomes. Each fund has its own priorities, budgetary allocation and application process. Types of funding for consideration include:

- European funds – The EU provides funding from a broad range of programmes.– go to the Welsh European Funding Office website for more information.
- Lottery funding – such as Heritage Lottery Fund, Postcode Lottery and BIG Lottery Fund which have a range of programmes from £5000 up to £millions.
- Charities, trusts & foundations – there are many of these operating and they often have a specific focus – either geographically or topically and will support local charities and projects.
- Businesses and sponsorship opportunities – including making the most of the Welsh carrier bag charge!
- Public bodies – local authorities, Welsh Government, UK Government and NRW may have annual funding opportunities or one-off competitions for their priority areas.
- Crowd funding – gathering support from a wide range and number of funders, often including individuals and usually using the internet to raise awareness for a specific project needing funds.
- Trading – increasingly funders are looking to support organisations with longer term sustainability in mind so developing trading opportunities can be something to consider too.

Your local County Voluntary Council and Wales Council for Voluntary Action will have up to date information on opportunities such as these as well as a host of other support available.

6. What next?

This summary is intended to be a snap shot of the management catchment and should enable you to be able to access further detail using Water Watch Wales. We welcome your views on how we can improve how we do this.

The summary supports the current consultation on the updated river basin management plans. We encourage you to look at the river basin management plans and respond to the consultation questions which you can find on our website. If you have any questions, please e-mail:

ardalbasnafongorllewincymru@cyfoethnaturiolcymru.gov.uk / westernwalesrbd@naturalresourceswales.gov.uk

7. Water Watch Wales

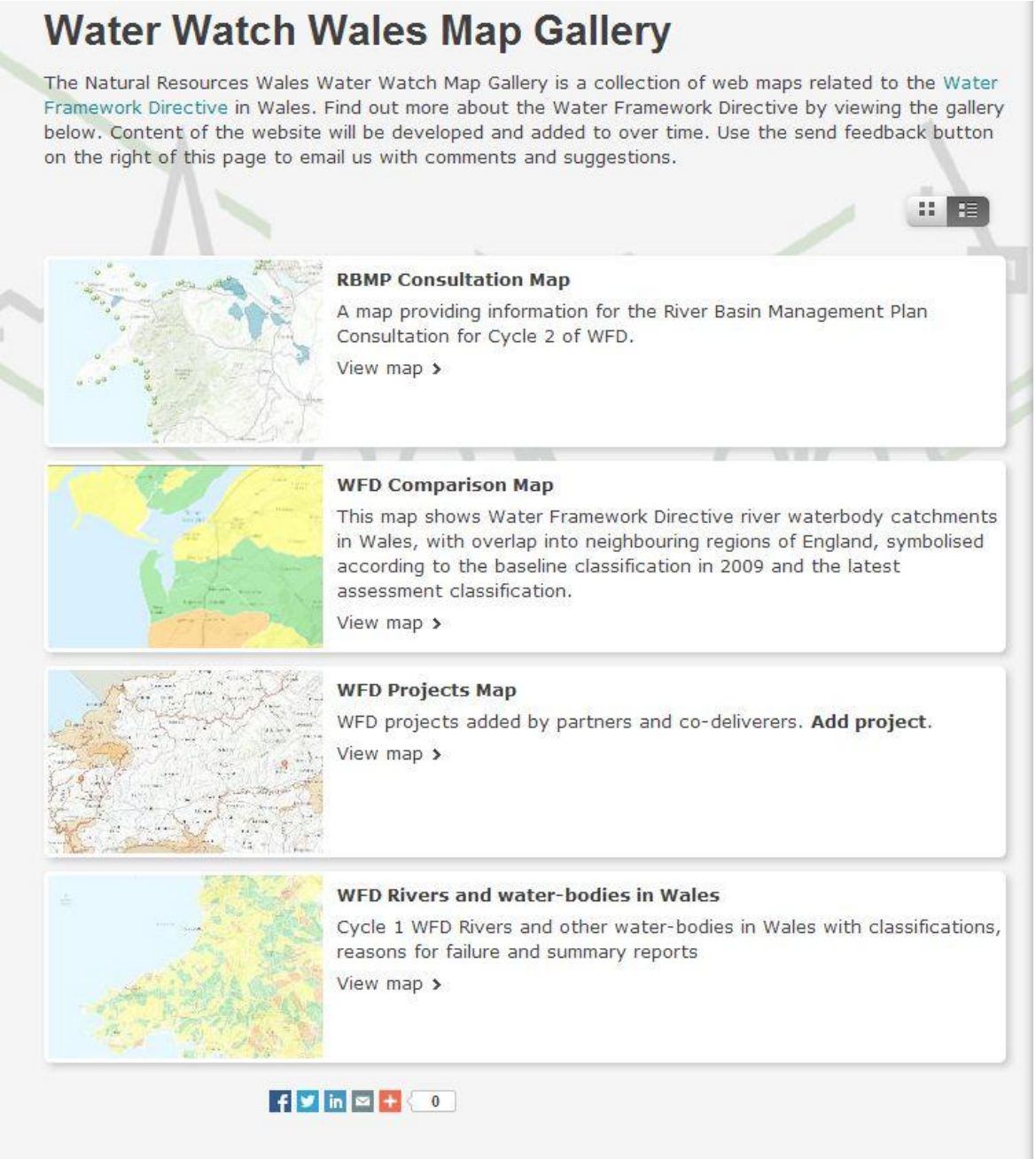
During the implementation phase of the first river basin management plan many of our partners and stakeholders requested access to data and information to assist them in helping to deliver local environmental improvements. It was quite clear early on that the first plan was difficult to navigate and access at a local scale. Consequently with both the support and input from the river basin district liaison panels a web based tool has been developed. This tool is called Water Watch Wales. This is an interactive spatial web-based tool that provides supporting information and data layers which can assist partners.

We are continuing to develop this tool and see it as a critical link between the more strategic river basin management plan and local delivery. It should enable the user to access information on:

- classification data at the water body scale
- reasons for not achieving good status
- objectives
- measures/actions, including protected area information
- partnership projects

Data can be retrieved in a number of formats (spreadsheets and summary reports). A user guide together with frequently asked questions is included with the tool and can be accessed from a link on the home page.

Figure 4. Opening screen shot for Water Watch Wales



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

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

enquiries@naturalresourceswales.gov.uk
www.naturalresourceswales.gov.uk