Cyfoeth Naturiol Cymru
Natural Resources Wales

Meirionnydd 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 Meirionnydd Management Catchment

Figure 1. Meirionnydd Management Catchment map

Agriculture and forestry are the predominant land uses in the Meirionnydd management catchment which extends from Borth on the southwest coast to southern end of Llyn Trawsfynydd. The area covers the catchments of the Dyfi and the Mawddach, as well as the mountain range of Cadair Idris and a long coastal strip extending south from Harlech.

There are large areas of forestry in the Dyfi valley and to the north of Dolgellau, however elsewhere agriculture dominates, predominantly sheep farming in the upland areas. The area has a rich history in mining activity dating back to Roman times and abandoned metal mines give rise to elevated metal concentrations in parts of the catchment.

Much of the Meirionnydd catchment area lies within Snowdonia National Park. Wales' only UNESCO biosphere area is in the Dyfi Valley. In the Dyfi biosphere, communities work to balance the conservation of biodiversity with sustainable use of the area. There are several EU bathing waters in this catchment and shellfish beds in the Dyfi and Mawddach estuaries. Tourism is of great economic importance to the area and provides diverse leisure opportunities to enjoy the coastline, mountains and estuaries. There are also many coastal, estuarine and inland sites designated for conservation and biodiversity purposes.

The Dyfi is also one of three areas in Wales where we are trialling an approach to natural resource planning/management. The purpose of the trials is to work with local stakeholders in determining how natural resources are best used and managed. A key element of this is understanding what roles our environment plays in supporting wider society. Our aim is to ensure that our environment is used sustainably, whilst at the same time we are responding to local needs, delivering benefits for people and business.

In January 2014 a Meirionnydd management catchment workshop was held at Coed Y Brenin Visitor Centre near Dolgellau. During this event the benefits of the catchment were captured. These included:

- High landscape value - from the wild character of the uplands in the Rhinogs to the coastal scenery.
- Tourism and recreation - safe beaches, range of recreation opportunities throughout catchment, though further scope to enhance recreation access to woodland and water.
- Forests and woodlands - for their ecological richness e.g. Meirionnydd oakwoods but also for timber production, wood fuel, recreation and jobs. The potential impact of tree diseases on the landscape was also noted.
- Biodiversity - salmonids, pearl mussels, coastal dune, woodland, riverine and upland habitats and species, reflected in SAC and SSSI designations
- Rural communities - farming for sheep and beef, Welsh language, local tradition and enterprise.

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
Map & eradicate invasive weeds.	In the Mawddach catchment members of the Prince Albert Angling Society worked to tackle invasive plant species and restore streamside habitat.	Prince Albert Angling Society	WFD TSO Fund
Dyfi Living Rivers Project	On the Nant Gwydol & Dulas South Rivers partners worked together to restore river catchments.	Montgomeryshire Wildlife Trust, New Dovey Fishery Association, National Farmers Union of Wales.	WFD TSO Fund

Case study - Prince Albert Angling Society (PAAS) - Mapping & Eradicating Japanese Knotweed & Himalayan Balsam on the Hengwrt Estate

Working in partnership with NRW PAAS successfully obtained funding to *'Map and Eradicate Invasive Weeds'* on Hengwrt Estate waters on Afon Mawddach & Afon Wnion in May 2012. The funding was used for training volunteers and to purchase equipment to carry out the work.

Future plans include continuing work on the Hengwrt Estate (constant difficulties with window of opportunity e.g. time of year, weather, river conditions & tides), and extending it further to other PAAS waters within Meirionnydd.

There is a continual threat from surrounding areas that are untreated and the anglers are well aware that a whole catchment approach is required. They are in touch with others in the area e.g. NRW work to clear Japanese Knotweed as part of the Dolgellau flood alleviation scheme and have linked in with Snowdonia National Park's "Snowdonia Japanese Knotweed Project" which could provide wider coordination for mapping and a future management strategy in the national park.

Left Bank of Mawddach - July 2012 Left Bank of Mawddach - Sept 2012

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 types of water bodies

Number of water bodies	Natural	Artificial	Heavily Modified	Total
River*	**46**	**0**	**8**	**54**
Lake	**6**	**0**	**6**	**12**
Coastal	**2**	0	**0**	**2**
Estuarine	**1**	0	**3**	**4**
Groundwater	**5**	0	0	**5**
Total	**60**	**0**	**17**	**77**

*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.

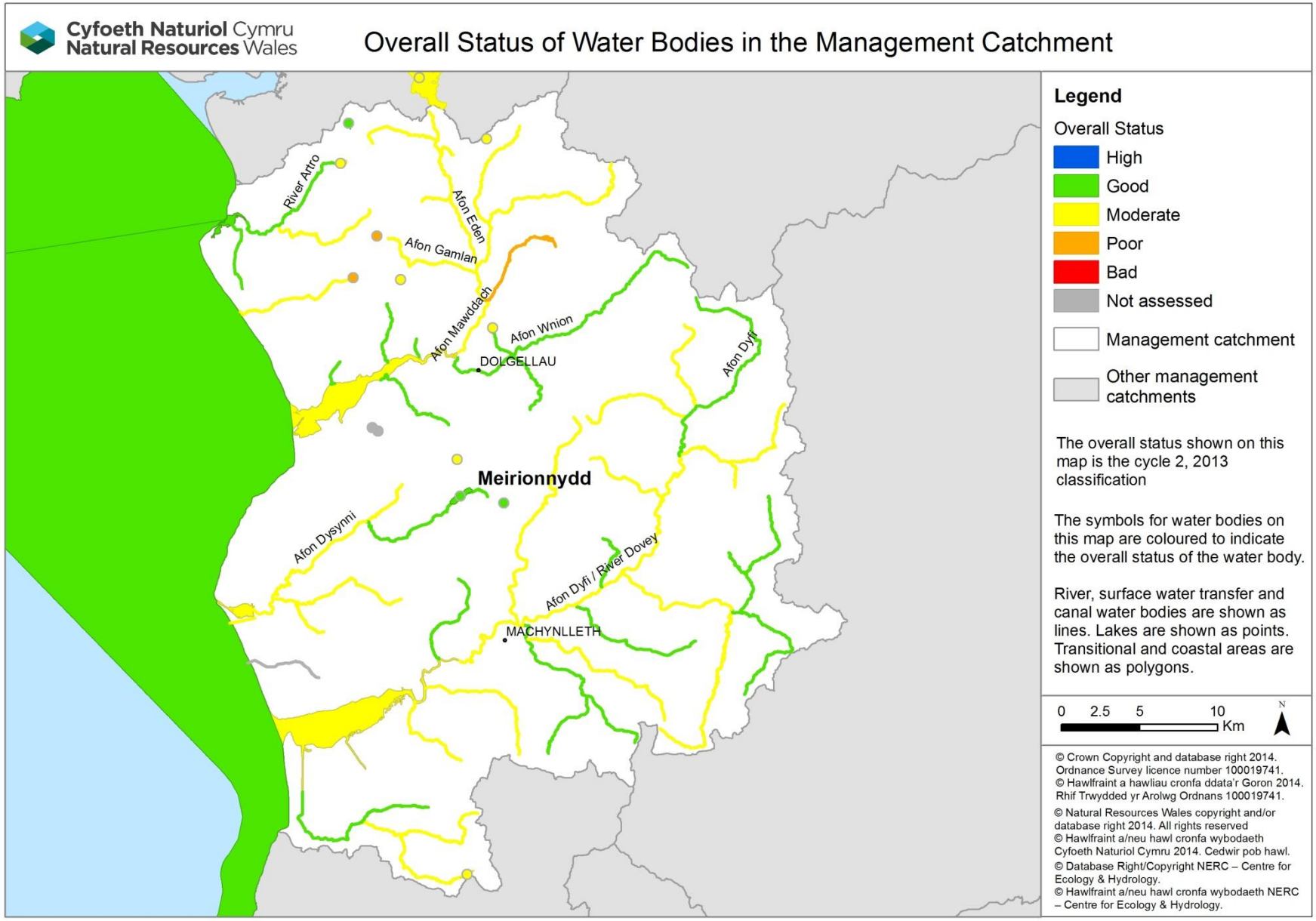
Table 3. Number and type of protected area

Protected Area	Number
Bathing Waters	**12**
Drinking Water Protected Areas	**13**
Natura 2000 and Ramsar sites	**18**
Nitrate Vulnerable Zones	**0ha**
Shellfish Waters	**2**
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.

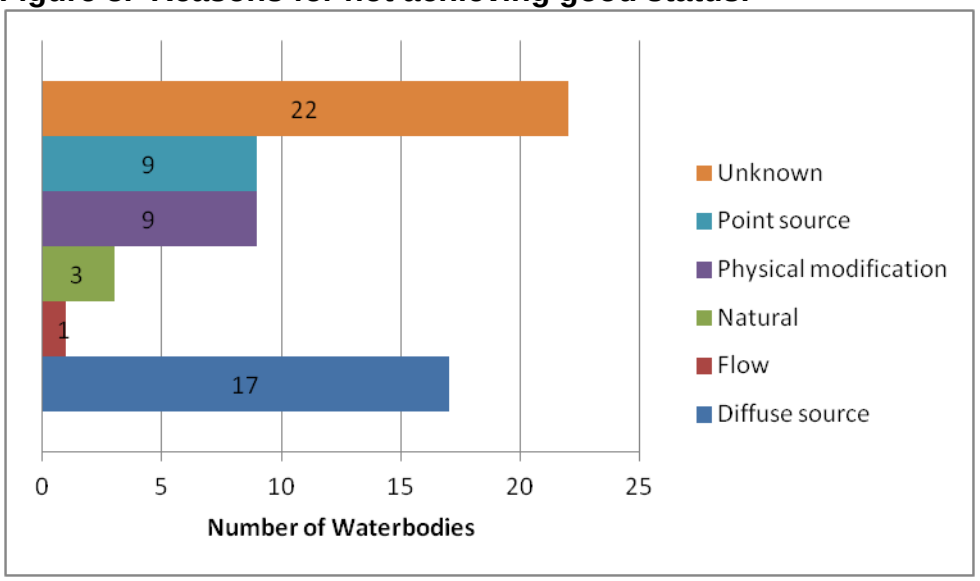
Figure 2. Current status of the Meirionnydd Management Catchment (new building blocks, 2013 interim classification)



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. Reasons for not achieving good status.



Discharges from abandoned mines are a significant issue in this catchment particularly on the Dyfi and Mawddach where sources include the Dylife lead mine and Gwynfynydd gold mine respectively. Acidification due to atmospheric deposition, sometimes exacerbated by natural conditions, mining or forestry is also identified as a problem in parts of the Dyfi and Mawddach. Acidification can cause toxic metals to leach out of the soils and enter rivers, which can cause problems to aquatic organisms. Bacteria from waste water treatment and diffuse sources pose a risk of bathing and shellfish waters failing to meet EC quality standards around the Meirionnydd coastline.

4.1 Workshop feedback on challenges

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.

- Invasive non-native species e.g. Japanese knotweed, Himalayan balsam, mink
- Recognition that phosphorus is a limited resource, need to minimise waste and recycle where possible
- Local concern about impacts from beachcombing and cockling, also tidal litter
- Need to resolve conflicting demands and uses of the environment to the satisfaction of all, for example access for fishing and canoeing.
- Flooding - increased rate of run-off from the uplands as result of land management (farming and forestry). Water reaches lowlands quicker and causes problem when coincides with tidal flooding
- Pollution from abandoned metal mines
- Diffuse pollution from rural land management e.g. sediments, nutrients

4.2 Dyfi natural resource management trial

The Environment Bill proposes new duties for Natural Resources Wales to take an area-based approach to the sustainable management of natural resources. The Dyfi river catchment is one of three areas being used to explore how to embed the ecosystems approach to natural resource management in a specific geographical area.

The Dyfi catchment has a wide range of habitat types, from blanket bogs in the mountains, through woodland and farmland, down to the coastal salt marshes, mud flats and sand dunes. Each of these habitat types provides a unique range of 'ecosystem services' that are important to people living in and visiting the Dyfi. For example, farmland and woodland deliver services such as food and timber; blanket bogs provide services such as carbon sequestration and flood alleviation; while sand dunes provide services of recreation and tourism. There are also significant challenges such as the mining legacy and ensuring agriculture and forestry on which so much of the landscape and local economy depends remain sustainable and viable.

Natural resource planning requires a joint collaborative planning exercise through which issues and priorities are agreed, opportunities are identified and existing mechanisms that impact on natural resources work together to achieve delivery.

The output from this approach is proposed to be an Area Statement which clearly sets out the priorities and opportunities for the management of natural resources in the Dyfi catchment. The ongoing River Basin Planning work within the Dyfi catchment will form an integral part of the natural resource management trial. More information on the ecosystems approach and natural resource management can be found in the Western Wales River Basin Plan.

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 measures.

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".	11
Address air pollution	Emissions controls to reduce	15

Measure	Description	No. of water bodies
	nitrogen and acidic deposition. 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".	12
Complete first cycle investigation	All ongoing WFD investigations from first cycle programme.	31
Drainage and water level management	Investigate and implement changes to land drainage regimes and structures to restore water levels.	21
Dredging and silt management	Includes reducing siltation at source through land management, and implementing sustainable dredging and silt disposal regimes.	7
Improve fish passage and habitat	Remove or modify barriers to fish passage	10
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.	12
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.	31
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	13
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 dredging and vegetation	6

Measure	Description	No. of water bodies
	management. Includes the national habitat creation programme to address coastal squeeze.	
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.	42
Other sustainable land and marine management practices	Includes measures to mitigate impacts from construction and maintenance of infrastructure, including within military training sites (includes both active and redundant military sites).	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.	1
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.	1
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.	1
Specific habitat and feature works	Restoration and/or conservation of specific habitat and features, including natural (e.g. caves, geological outcrops) and human structures (e.g. bridges, ruins).	21
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.	29
Sustainable agricultural practices	Implement basic and additional	38

Measure	Description	No. of water bodies
	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. Within NVZs comply with storage and spreading regulations.	
Sustainable fisheries management	Includes measures for both freshwater and marine fisheries to reduce and mitigate impacts	12
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.	27
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.	2
Waste management	Includes appropriate management of spoil and sludge, illegal fly-tipping and litter	12

Some examples of actions that are already under way in the Meirionnydd catchment include:

- Welsh Water and private sewage dischargers are ensuring appropriate treatment of waste water.
- We have conducted pollution prevention campaigns in the Dyfi and Mawddach estuaries, sampling and visiting private properties and farms, to address diffuse sources of organic and bacterial pollution.
- We are monitoring the Mawddach to determine the extent of the pollution from the Copper Bog and Gwynfynydd Gold Mine, as part of work to develop feasible measures to address the issue.
- Natural Resources Wales is improving forest management to reduce the impact of acidification and protect rivers from sediment and remove barriers to fish migration
- On the Dyfi floodplain, we are working to restore natural processes to manage flooding and restore water levels in wetlands. This will benefit the internationally protected Cors

Fochno bog and remove the long-term need to restore the flood banks, which are in poor condition.

- Snowdonia National Park Authority and partners are beginning work to develop a Japanese knotweed strategy.
- Afon Eden LIFE+ Project “Pearls in Peril” - Large collaborative project with European Commission, Scottish Natural Heritage, SNPA, NWTRA and others. This programme includes fencing works to manage siltation and diffuse pollution, habitat restoration and creation ongoing to 2016/17.
- Natural Resources Wales is investigating potential impacts of abstraction on the ecology of the Eden and working with abstractors to find solutions.

Natural Resources Wales has worked with partners on the Angell, Dulas North, Nant Gwydol and Dulas South – middle water bodies as part of our focus during the first river basin cycle.

5.2 Workshop feedback on priorities and 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 solutions were flagged:

- **Increase capacity of uplands to retain water.**
  Proposed solutions include: creating new storage areas, improved incentives either by better targeting of agri-environment schemes (Glastir and Glastir Woodlands) or other form of payment for ecosystem services, increased tree planting, soil and peat restoration. Use new aerator technology and plant different grass varieties. Solutions involve landowners (farming and forestry including NRW) and their advisors, as well as WG, NRW and NGOs but needs a lead. Potential role for insurance industry if can reduce flood risk. Multiple benefits of this approach, particularly if carried out at a catchment scale.

- **Diffuse pollution from rural land management.**
  Proposed solutions include: Provide more advice to farmers and landowners on tree planting possibly through a trial in part of catchment and one manure spreading; provide improved guidance to reduce pollution from septic tanks; need for agri-environment schemes to be longer term

- **Pollution from abandoned metal mines.**
  Proposed solutions include: Exclude stock from some areas, use specialist seed mixes or geotextile matting to encourage vegetation cover and reduce run-off from exposed spoil, re-align watercourses where needed, consider alternatives such as bio char, but remember unique biodiversity associated with some of the old mine areas. Snowdonia National Park Authority may be able to assist locally, continue work with NRW, WG, DEFRA, Coal Authorities and Universities to develop solutions and best practice.

- **Need to resolve conflicting demands and uses of the environment to the satisfaction of all, for example access for fishing and canoeing.**
  Proposed solutions include: Use learning from elsewhere and trial in Meirionnydd e.g. Scottish model or Glaslyn system where gauges show river level is appropriate for canoeing, agreeing access and exit points for canoeists, dialogue needed between landowners, fishing clubs and Governing Body of the Sports, education required for both canoeists and anglers.

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 4 proposed alternative objectives and justifications

Alternative objective	Justifications	Number of water bodies	Water body
Extended deadline	Natural conditions – recovery time from acidification	8	Einion, Dulas North, Gamlan, Llyn Cwm Bychan, Llyn Hywel, Llyn Bodlyn, Llyn Cwm Mynach, Llyn Cau
Less stringent objective	Technically infeasible – ubiquitous and persistent chemical	1	Dyfi - tidal limit to Afon Twymyn

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 covering projects that have a clear link with the Europe 2020 strategy – go to WEFO for more information as the programmes develop.
- 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, Trust & 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.
- Crowdfunding – 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:

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7. Water Watch Wales

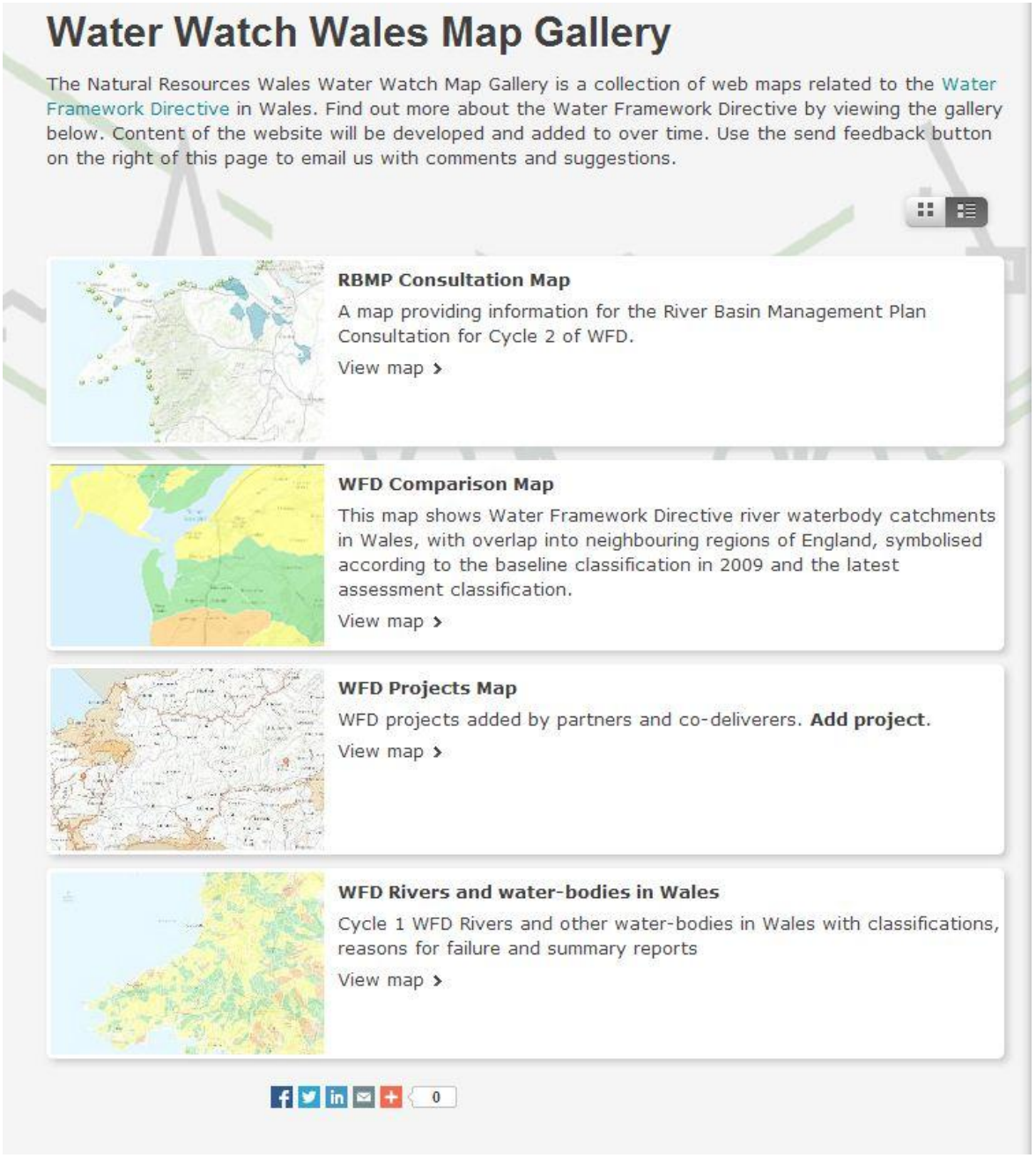
During the implementation phase of the first river basin management plan many of our partners and stakeholders requested access to data and information to assist them in helping to deliver local environmental improvements. It was quite clear early on that the first plan was difficult to navigate and 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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