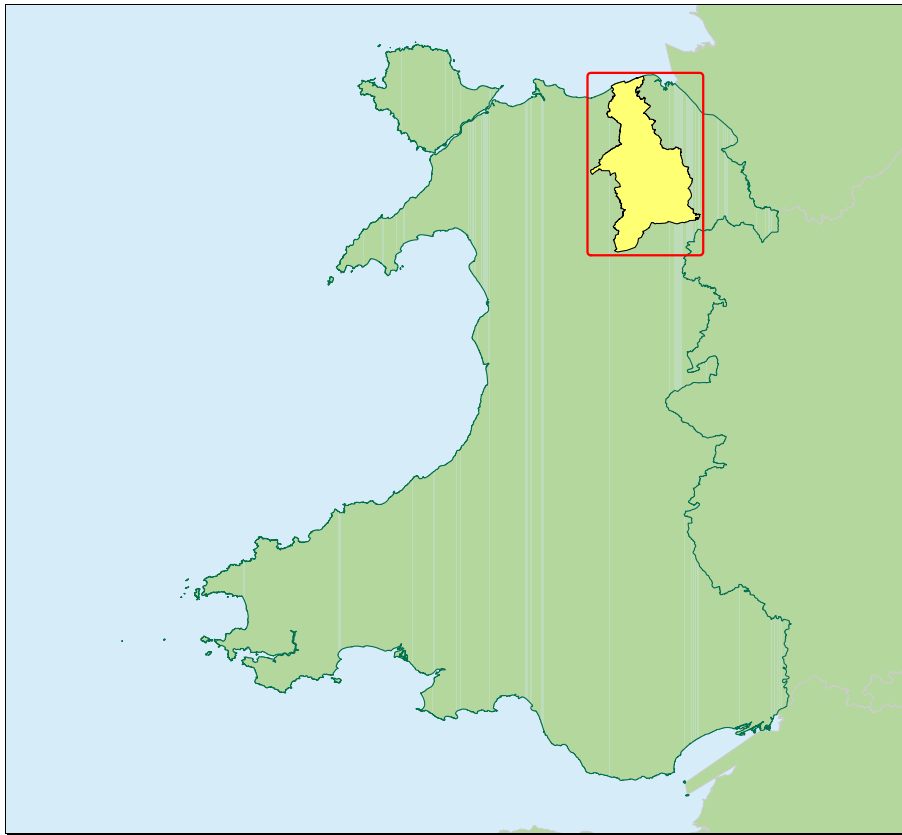


Local Evidence Package

Denbighshire

07/10/2013



Local Evidence Package

As of 1st April 2013, the Countryside Council for Wales, Environment Agency Wales and Forestry Commission Wales became Natural Resources Wales/Cyfoeth Naturiol Cymru.

Natural Resources Wales has inherited the statutory consultee role that both Environment Agency Wales and the Countryside Council for Wales had in the Strategic Environmental Assessment (SEA) process, under the Environmental Assessment of Plans and Programmes (Wales) Regulations (2004 No. 1656 (W170) that implement the SEA Directive.

We will work with relevant responsible authorities at various stages of the SEA process. This includes provision of data and information to describe baseline environmental conditions at the scoping stage of the SEA process. This evidence pack is intended to help with that. It is intended primarily for use by plan-making authorities such as Local Planning Authorities and Regional Transport Planning Consortia in their discussions with Natural Resources Wales Planning Liaison teams. It summarises environmental information available from Natural Resources Wales. Information is presented in the form of maps cut to Local Authority areas, accompanied by a brief description of the data. Further interpretation is therefore required to assess the meaning of the data in terms of decision making.

Plan-makers will be able to use this information in preparing both plans and accompanying Strategic Environmental Assessment/ Sustainability Appraisals (SEA/SA).

The pack will show plan-making bodies what information we will be able to provide for measuring change as a result of their plan. Some historical trend data is included in this pack as well as forecasts. Plan-making bodies may need to augment this with further trend data so that they can forecast likely changes in the state of the environment without a plan and meet one of the SEA Directive's requirements.

In addition, these packs can be useful for providing evidence for other decision making processes, such as Community Strategies, and Local Service Boards.

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These packs will be updated periodically, normally twice a year. Packs for Local Authorities are made available on the Local Government Data Unit Wales InfoBaseCymru website <http://www.infobasecymru.net> Packs for National Parks may be requested from the Environmental Assessment & Reporting Team (contact details below) or via your Natural Resources Wales Planning contacts.

Please send all comments or enquiries regarding this package to:

The Environmental Assessment & Reporting Team
Natural Resources Wales
Tŷ Cambria, 29 Newport Road, Cardiff CF24 0TP

ebost:
local.evidence@cyfoethnaturiolcymru.gov.uk
email:
local.evidence@naturalresourceswales.gov.uk

How to Access our Data

This document shows data and information that is available from Natural Resources Wales for Strategic Environmental Assessment and planning purposes.

The Local Evidence Packs were originally produced by Environment Agency Wales so most of the datasets currently included came from Environment Agency Wales. The packs are gradually being developed to include relevant datasets from Countryside Council for Wales and Forestry Commission Wales as well.

There will be a transition period of up to two years during which Natural Resources Wales will still be using the IT systems of its parent bodies, i.e. Environment Agency, Countryside Council for Wales and Forestry Commission Wales, to provide data and information to the public and our professional partners.

Many of the datasets illustrated in this document are available through the **'What's In Your Backyard?'** pages of the Environment Agency web site: www.environment-agency.gov.uk (At Home & Leisure> What's In Your Backyard?) or in published reports (Planning & Research> Publications & Reports).

DataShare <http://www.geostore.com/environment-agency/> is the Environment Agency's data download and live feed portal, through which spatial datasets can be provided directly to the public and professional partners (such as other government organisations), contractors and commercial licensees. Natural Resources Wales is currently continuing to use DataShare to provide data.

Natural Resources Wales is also continuing to provide data via the Countryside Council for Wales website <http://www.ccw.gov.uk> and the Forestry Commission website <http://www.forestry.gov.uk>:

GIS data downloads

<http://www.ccw.gov.uk/landscape--wildlife/protecting-our-landscape/gis-download---welcome.aspx>

<http://www.forestry.gov.uk/datadownload>.

Landmap

<http://www.ccw.gov.uk/landscape--wildlife/protecting-our-landscape/landmap.aspx>

Open Access Maps

<http://www.ccw.gov.uk/enjoying-the-country/open-access-land/open-access-maps.aspx>

Forestry Commission Wales Map Viewer

<http://www.forestry.gov.uk/forestry/INFD-8A9FPS>

For further information please talk to your Natural Resources Wales Planning contact or email the Environmental Assessment & Reporting team

ebost: local.evidence@cyfoethnaturiolcymru.gov.uk email: local.evidence@naturalresourceswales.gov.uk

SEA Guidance

The Strategic Environmental Assessment Guidance documents previously provided by the Countryside Council for Wales are still available from the CCW website:

<http://www.ccw.gov.uk/landscape--wildlife/managing-land-and-sea/environmental-assessment/strategic-environmental-assess.aspx>

Note that some of the links in these documents may be broken. We apologise for this. The guidance documents are currently being updated and the updated versions will be made available as soon as possible.

The Environment Agency guidance, Strategic Environmental Assessment and Climate Change: Guidance for Practitioners is still available here:

<http://www.environment-agency.gov.uk/research/policy/40121.aspx>

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The Water Framework Directive, River Basin Management Plans & Classification

As of 1 April 2013, the Countryside Council for Wales, Environment Agency Wales and Forestry Commission Wales became Natural Resources Wales/Cyfoeth Naturiol Cymru.

Natural Resources Wales is now the Competent Authority in Wales for implementing the Water Framework Directive.

Water Framework Directive

The Water Framework Directive (WFD) establishes a framework for the protection of surface waters (rivers, lakes, estuaries and coastal waters) and groundwaters. Its purpose is to prevent deterioration and improve the status of aquatic ecosystems, promote sustainable water use, reduce pollution of groundwater and contribute to mitigating the effects of floods and droughts. The WFD requires us to achieve good status in all of our water bodies by 2027. This means that we must protect and improve the quality of our water bodies so that they can support natural biological communities and are free from pollution.

River Basin Management Plans

River Basin Management Plans (RBMPs) are statutory plans which deliver the requirements of the WFD. Public authorities are required to have regard to them when exercising their functions.

RBMPs outline the main issues for the water environment and the actions we all need to take to deal with them. RBMPs follow a 6 year cycle. The first plans were approved by the Minister in December 2009. Future plans will be published in 2015 and 2021.

There are 3 RBMPs which cover Wales: Dee, Severn and Western Wales.

Natural Resources Wales has responsibility for drawing up the RBMPs for Western Wales and the Dee - working in partnership with a wide range of public, private and voluntary organisations (including water companies and local government). The Environment Agency retains responsibility for the RBMP for the Severn.

The RBMPs are available at:

<http://www.environment-agency.gov.uk/research/planning/33106.aspx>

Integrated catchment management and working with co-deliverers

Our ambition for Wales' first River Basin Management Plans (RBMPs) is to achieve 50% of all water bodies at Good or better status (or potential) by 2015 and work towards the delivery of objectives for Protected Areas such as Natura 2000 sites and Bathing Waters. To achieve these objectives, many different co-deliverers need to take action, including land managers, farms and businesses, water companies, the third sector (voluntary and charitable groups), local communities, planners and public bodies.

We are delivering a programme of investigations to identify the reasons why water bodies are failing Good Status, and working with co-deliverers to ensure the evidence base for targeting actions is robust. Where there are gaps or no clear mechanisms to deliver improvements we will work with co-deliverers to gather evidence and develop cost-effective solutions.

We also want to work with others to develop our approach to integrated catchment management, which we believe can deliver greater and multiple benefits for people and wildlife.

For information about partnership projects in Wales see:

<http://www.environment-agency.gov.uk/research/planning/140359.aspx>

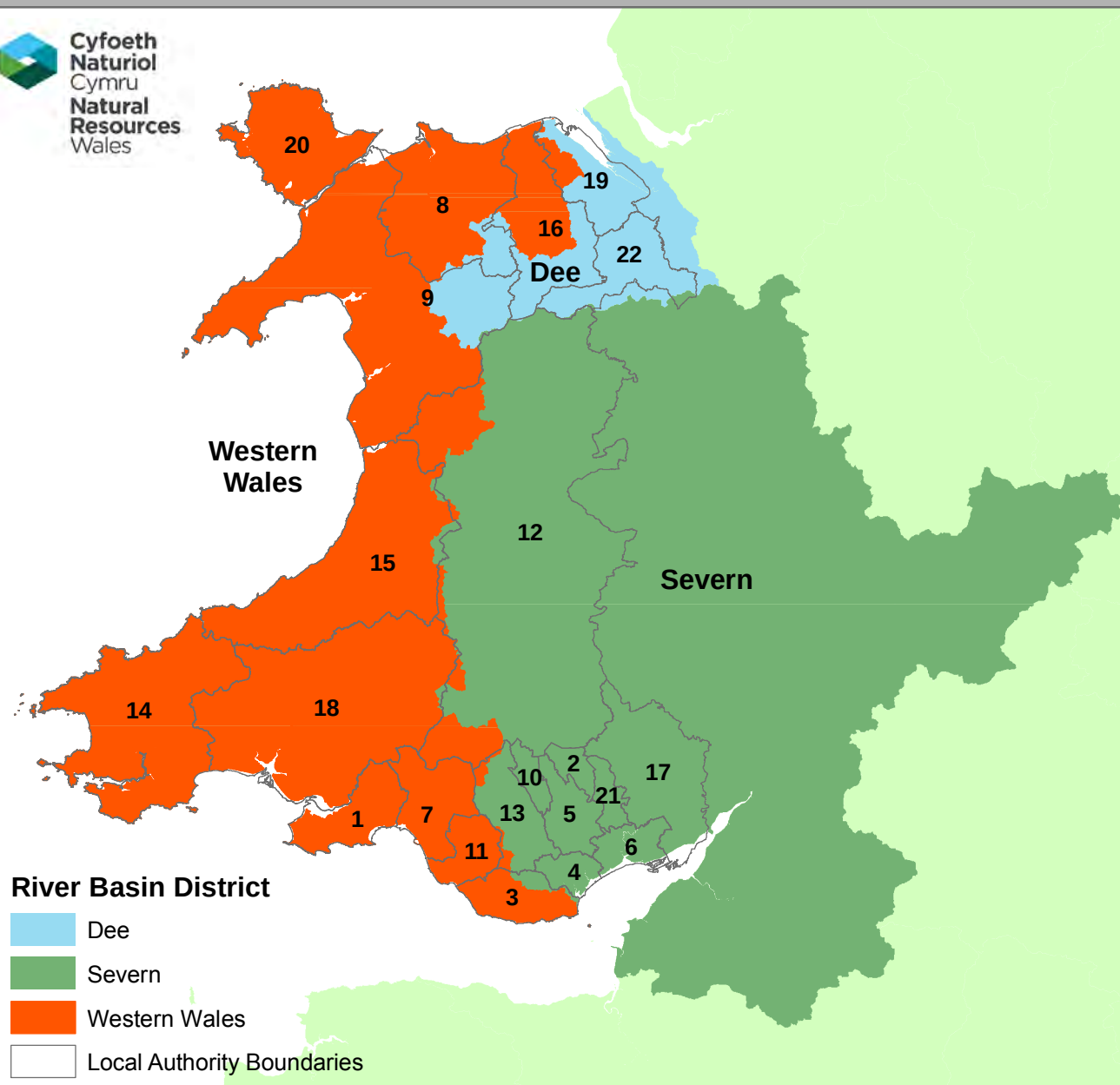
WFD Classification

The way we classify our waters has changed. Previously, we used the General Quality Assessment (GQA) scheme to assess river water quality in terms of chemistry, biology and nutrients. Now the WFD classification looks at over 30 measures, grouped into ecological status (this includes biology as well as 'elements' like phosphorus and pH) and chemical status ('priority substances' e.g. mercury). The WFD covers estuaries, coastal waters, groundwater and lakes as well as rivers. We have updated our existing assessment techniques and have developed new ones for indicators we have not assessed before.

For further information on WFD classification see:

<http://www.environment-agency.gov.uk/research/planning/33260.aspx>

River Basin Districts

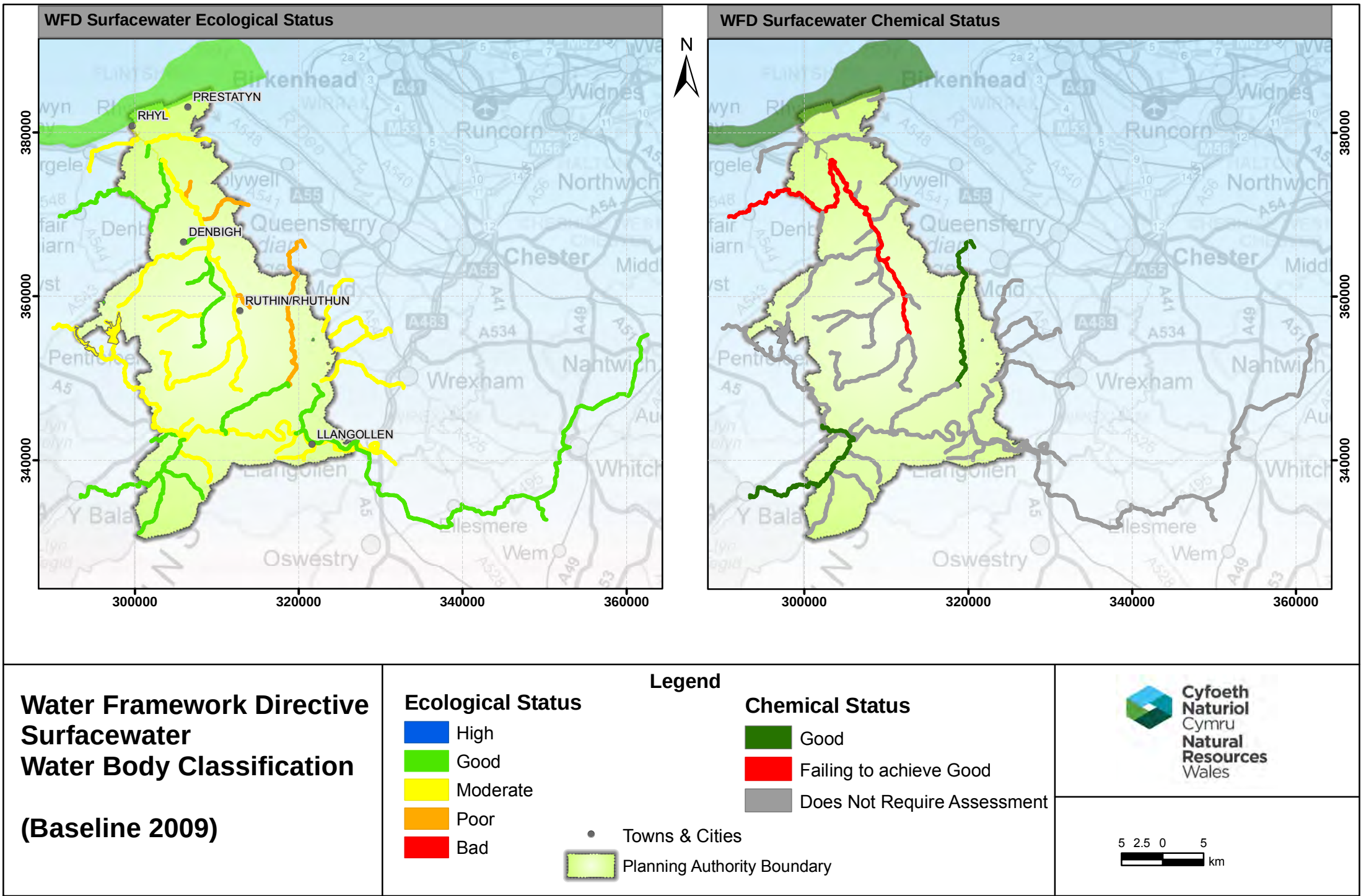


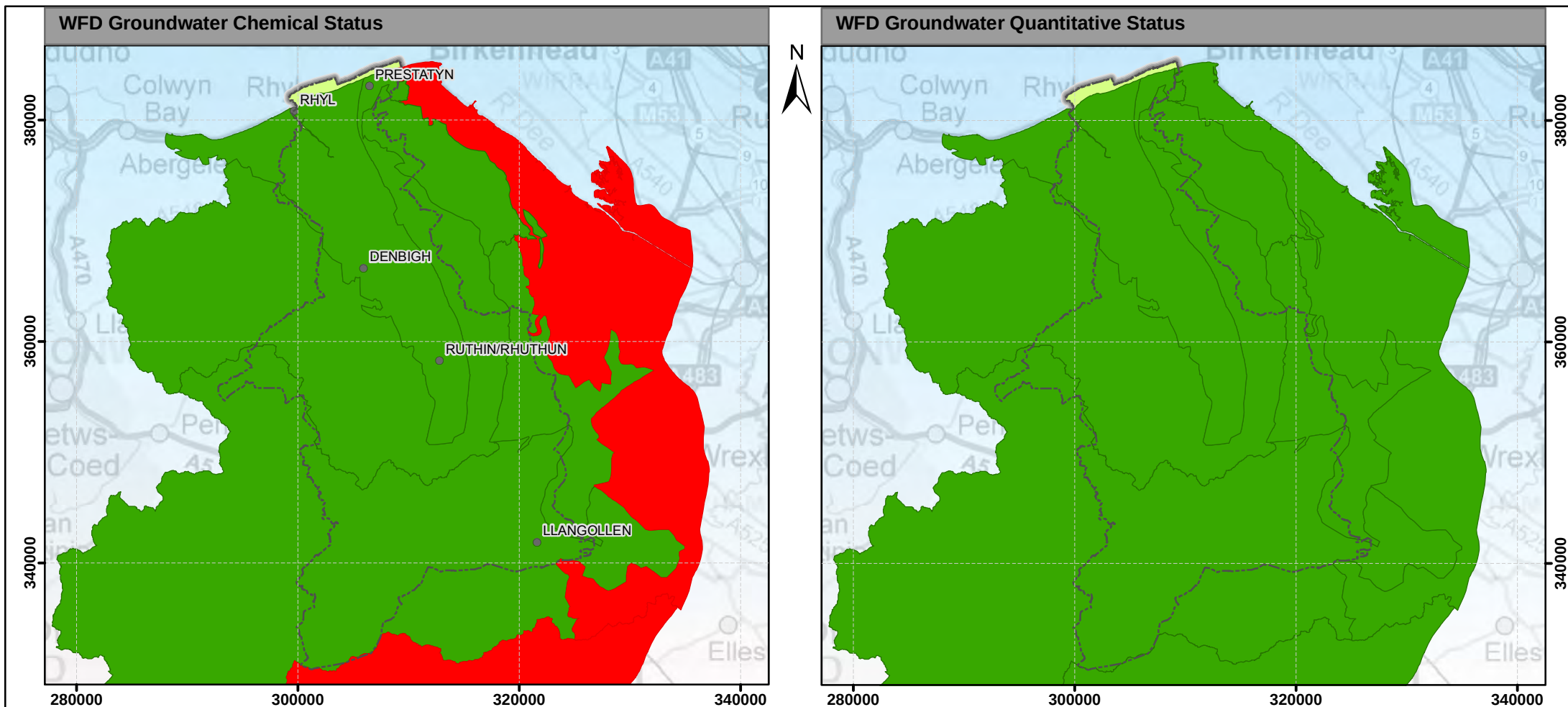
River Basin Districts

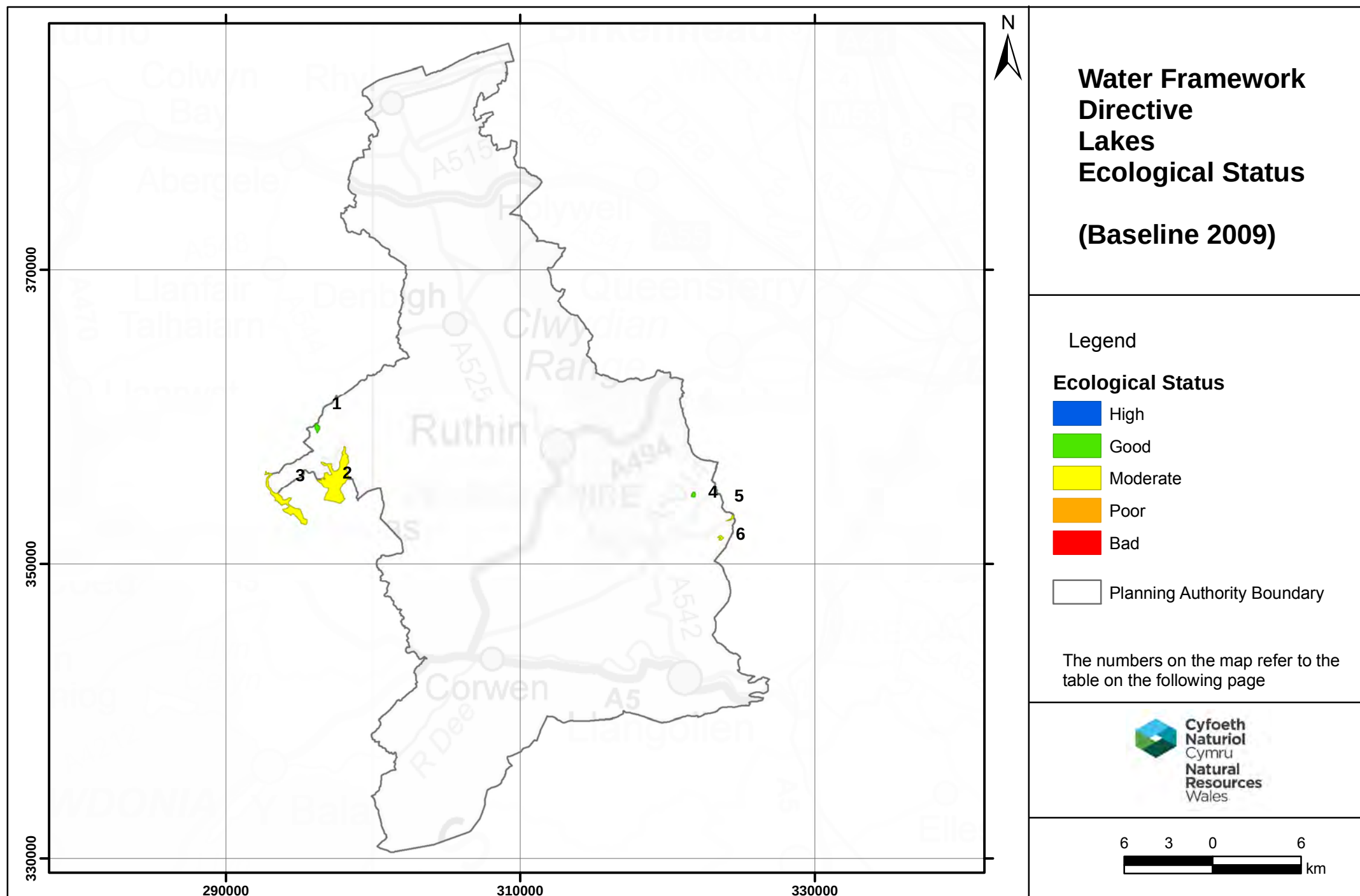
A river basin is the area of land from which all surface run-off and spring water flows through a sequence of streams, lakes and rivers into the sea at a single river mouth, estuary or delta. It comprises one or more individual catchments. A river basin district is a river basin or several river basins, together with associated coastal waters.

The map on this page shows the river basin districts that cover Wales.

Local Authority	Label No.
Abertawe - Swansea	1
Blaenau Gwent - Blaenau Gwent	2
Bro Morgannwg - the Vale of Glamorgan	3
Caerdydd - Cardiff	4
Caerffili - Caerphilly	5
Casnewydd - Newport	6
Castell-nedd Port Talbot - Neath Port Talbot	7
Conwy - Conwy	8
Gwynedd - Gwynedd	9
Merthyr Tudful - Merthyr Tydfil	10
Pen-y-bont ar Ogwr - Bridgend	11
Powys - Powys	12
Rhondda Cynon Taf - Rhondda Cynon Taf	13
Sir Benfro - Pembrokeshire	14
Sir Ceredigion - Ceredigion	15
Sir Ddinbych - Denbighshire	16
Sir Fynwy - Monmouthshire	17
Sir Gaerfyrddin - Carmarthenshire	18
Sir y Fflint - Flintshire	19
Sir Ynys Mon - Isle of Anglesey	20
Tor-faen - Torfaen	21
Wrecsam - Wrexham	22







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Water Framework Directive: Lakes - Ecological Status (Baseline 2009)

Label No.	Lake	Ecological Status	Chemical Status
1	Llyn Bran	Good	Does Not Require Assessment
2	Llyn Brenig	Moderate	Does Not Require Assessment
3	Alwen Reservoir	Moderate	Does Not Require Assessment
4	Llyn Cyfynwy	Good	Does Not Require Assessment
5	Nant-y-Ffrith Reservoir	Moderate	Does Not Require Assessment
6	Pendinas Reservoir	Moderate	Does Not Require Assessment

Water Framework Directive: Water Bodies Status Summary (Baseline 2009) for Denbighshire

Water Body Category	Total No. Water Bodies	Ecological status					Chemical status			Quantitative status	
		High	Good	Moderate	Poor	Bad	Good	Failing to achieve Good	Does not require assessment	Good	Poor
River	41		16	21	4		3	2	36		
Lake	6		2	4					6		
Transitional	1			1					1		
Coastal	1		1				1				
Groundwater	7						5	2		7	

Water Framework Directive Status Maps

The five maps shown in the previous four pages show the baseline, 2009, classification of WFD water bodies. The Water Framework Directive requires there to be no deterioration from this baseline. The aim is to achieve at least Good status by 2015. Where this is not possible and subject to the criteria set out in the Directive, we aim to achieve Good status by 2021 or 2027.

Ecological status is shown for all surfacewater water bodies. Ecological status includes biological elements such as invertebrates and fish as well as supporting physico-chemical elements such as phosphates and nitrates.

Chemical assessment of water bodies is risk-based. Not all water bodies require assessment. Chemical monitoring looks for **priority substances** such as mercury that have been identified as presenting a significant risk to or via the aquatic environment under the Water Framework Directive. We only monitor for priority substances in water bodies where there are known discharges of these pollutants. A list of priority substances can be found here:

http://ec.europa.eu/environment/water/water-framework/priority_substances.htm.

Groundwaters are classified in terms of chemical and quantitative status.

Quantitative status is about the impacts of groundwater abstraction. Over-abstraction of groundwater may reduce river flows and water levels in lakes and wetlands. It may also cause degradation of groundwaters due to saline intrusion from the sea.

Transitional waters are intermediate between fresh and marine water. They include estuaries and saline lagoons.

Lake water bodies and status are shown separately because many of them are too small to identify on the map. The numbered labels shown on the map refer to the table on the page following the map which gives the ecological and chemical status for each lake.

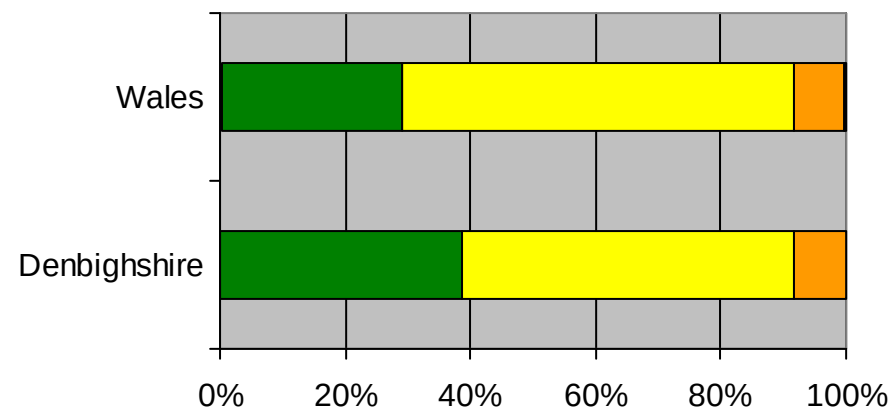
Water Bodies Status Summary

The Water Bodies Status summary table above shows the numbers of each type of water body in each ecological, chemical and quantitative (groundwater only) class according to the baseline, 2009, classification of WFD water bodies.

Baseline 2009 data is shown here because this is the standard that WFD progress will be measured against. Annual updates to the classification and further information on the reasons for failure and the actions that need to be taken are available from your Planning Liaison contact or the Environmental Assessment & Reporting team (local.evidence@naturalresourceswales.gov.uk).

Water Framework Directive: Surfacewater Water Bodies Ecological and Chemical Status (Baseline 2009) for Denbighshire

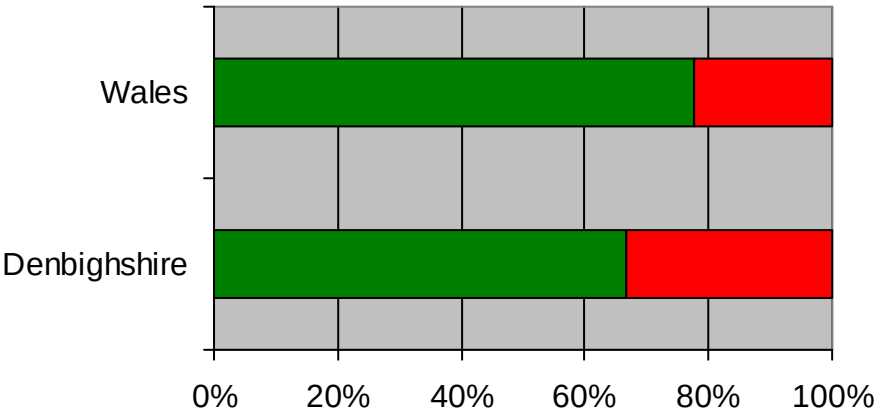
Water Framework Directive: Surfacewater Ecological Status, Percentage of Water Bodies in Each Class



	Denbighshire	Wales
Bad	0	4
Poor	4	92
Moderate	26	738
Good	19	339
High	0	5

Number of water bodies in each class

Water Framework Directive: Surfacewater Chemical Status, Percentage of Water Bodies in Each Class



	Denbighshire	Wales
Fail	2	21
Good	4	73

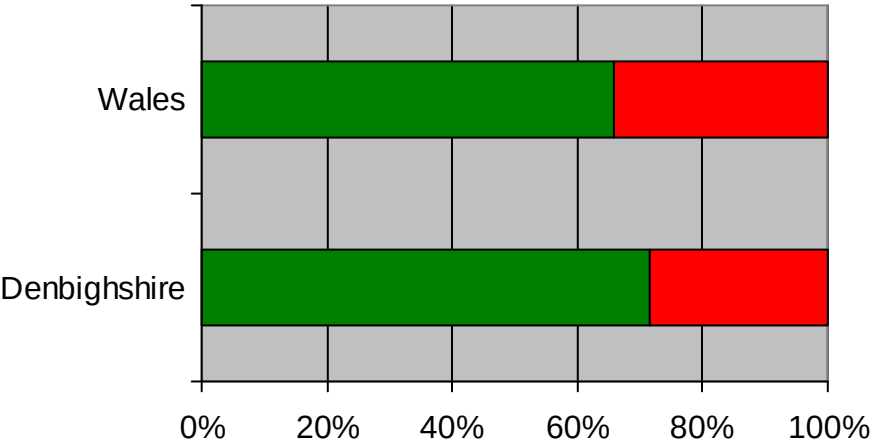
Number of water bodies in each class

The charts above show the percentage of surfacewater water bodies in each class for the whole of Wales and for the Planning Authority.

The tables show the numbers of surfacewater water bodies in each class for the whole of Wales and for the Planning Authority.

Water Framework Directive: Groundwater Overall Status (Baseline 2009) for Denbighshire

Water Framework Directive: Groundwater Overall Status, Percentage of Water Bodies in Each Class



	Denbighshire	Wales
Poor	2	13
Good	5	25

Number of water bodies in each class

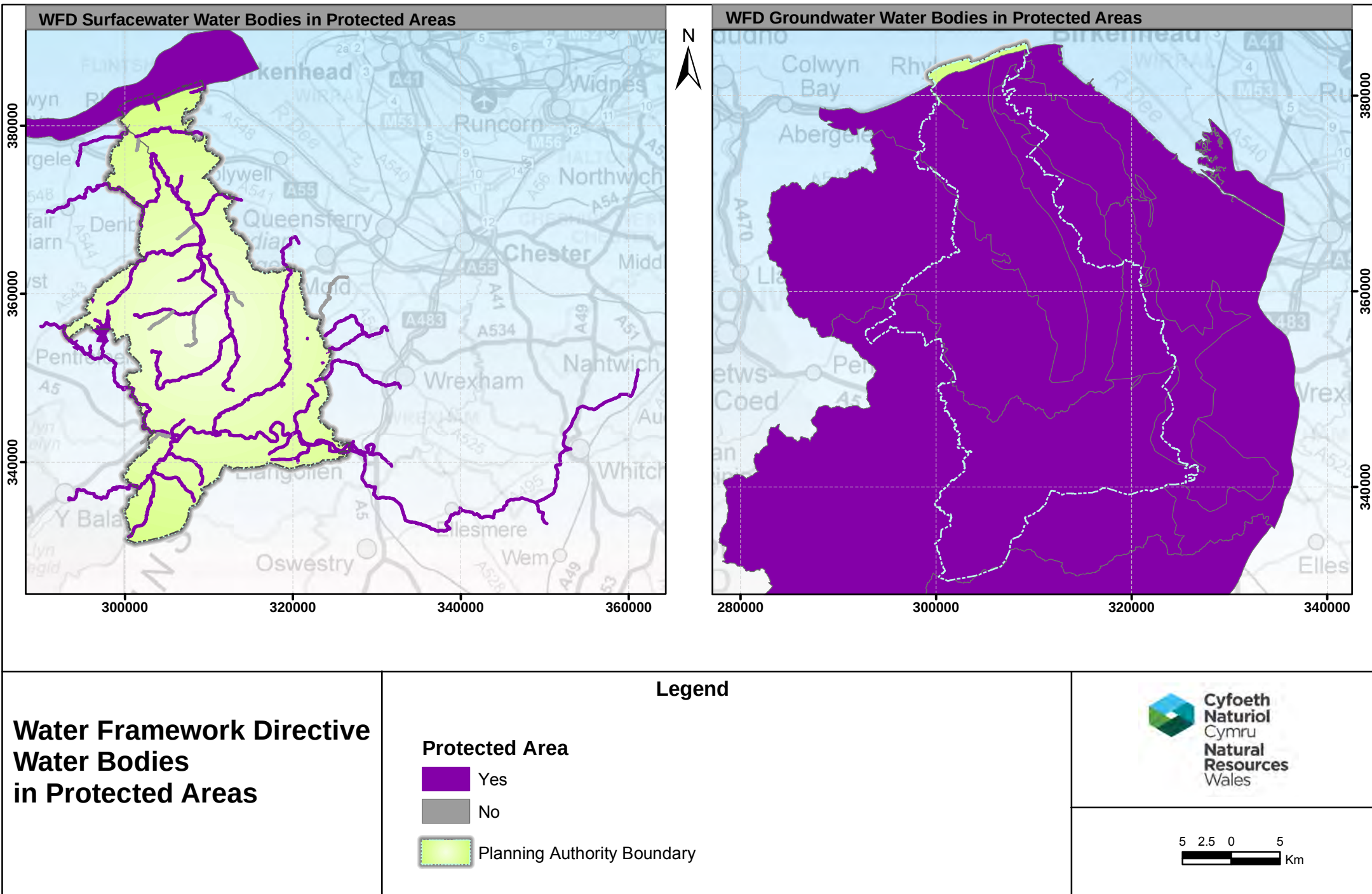
The overall classification status for groundwaters is assessed by combining the chemical status with the quantitative status. If either or both of these is Poor, then the overall status is Poor.

For further information on WFD classification methods see:

<http://www.environment-agency.gov.uk/research/planning/33260.aspx>

The chart on the left shows the percentage of groundwater water bodies in each class for the whole of Wales and for the Planning Authority.

The table shows the number of groundwater water bodies in each class for the whole of Wales and for the Planning Authority.



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Water Framework Directive - Water Bodies Protected Areas Summary (Baseline 2009) for Denbighshire

Water Body Category	Total Number of Water Bodies Affecting a Protected area	Number of Water Bodies Affecting: Type of Protected Area							
		Bathing Waters	Drinking Water	Fresh Water Fish	Shellfish Waters	Nitrates	Urban Waste Water	Habitats & Species	Wild Birds
River	34	4	2	28		1		13	4
Lake	6		6	2				1	
Transitional	1	1							
Coastal	1	1			1			1	1
Groundwater	7		7			7			

The table above shows the number of WFD water bodies that are associated with a designated Protected Area.

Protected Areas

The Water Framework Directive specifies that areas requiring special protection under other EC Directives and waters used for the abstraction of drinking water are identified as protected areas. The different types of protected areas have their own objectives and standards.

Bathing Waters - bodies of water designated as recreational waters, including areas designated as Bathing Waters

Drinking Water - areas designated for the abstraction of water for human consumption

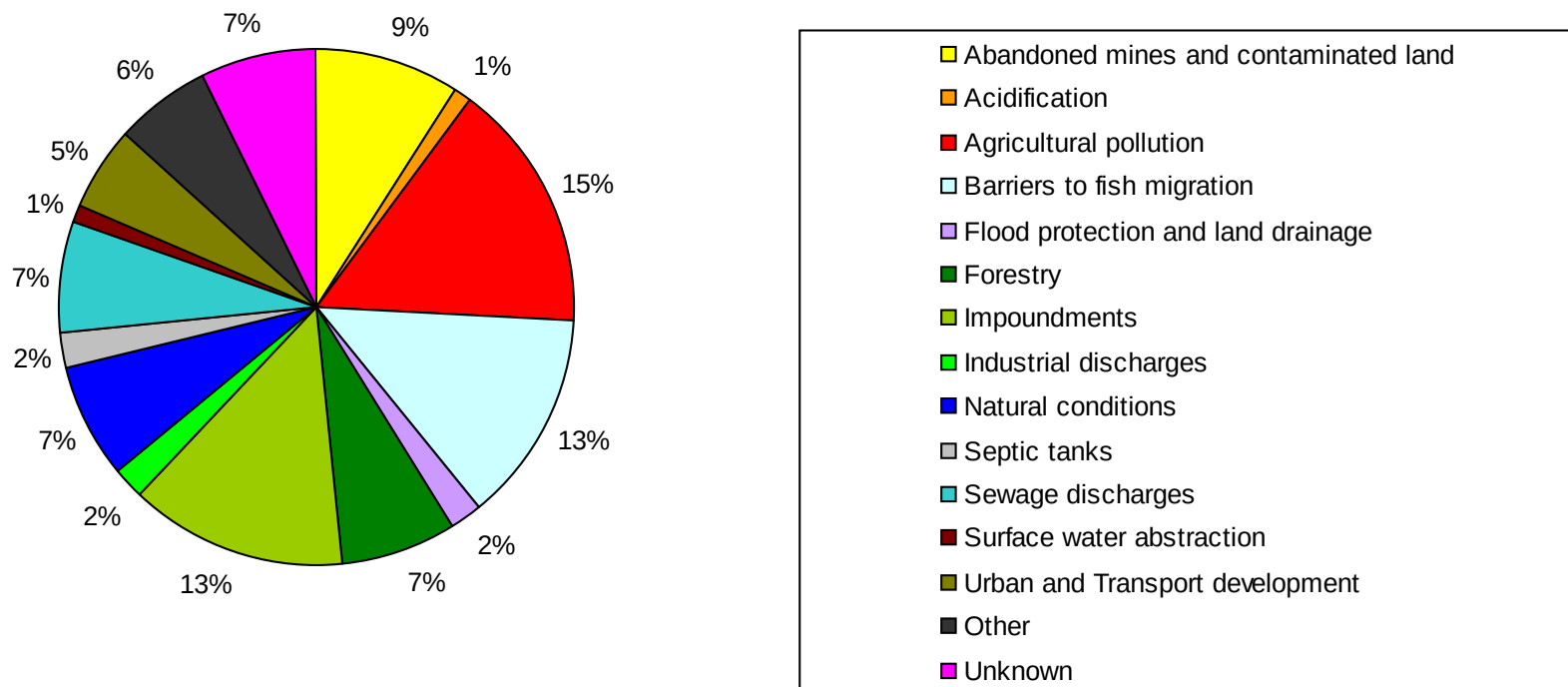
Freshwater Fish and Shellfish Waters - areas designated for the protection of economically significant aquatic species

Nitrates and Urban Waste Water - nutrient-sensitive areas, including areas identified as Nitrate Vulnerable Zones under the Nitrates Directive or areas designated as sensitive under the Urban Waste Water Treatment Directive (UWWTD)

Habitats & Species and Wild Birds - areas designated for the protection of habitats or species where the maintenance or improvement of the status of water is an important factor in their protection, including relevant Natura 2000 sites

Water Framework Directive: Reasons for Failure for Water Bodies in Denbighshire

Reasons for Failure



Reasons for failure chart and table

This pie chart shows confirmed or suspected reasons for water bodies in the Planning Authority that are failing to meet WFD objectives. It includes all water body types.

This data represents a snapshot of the current understanding of the reasons for failure data at the time of collation (early 2013). We are continuing to collect and record reasons for failure as part of our ongoing programme of investigations. Further collations of reasons for failure will be made annually.

Natural conditions – this category includes water bodies failing due to ecological recovery time, natural low flows and natural mineralisation.

Notes:

- The chart does not show the number of water bodies failing for particular reasons. It shows the number of times each reason for failure has been identified.
- There can be more than one reason for failure for each water body.
- This data is to be viewed as indicative only as it is based on variable amounts and quality of evidence.
- Not all water bodies have been assessed.

This graph was produced using the 2013 RFF data.

Water Framework Directive: Reasons for Failure for Water Bodies in Denbighshire

We have used all our reasons for failure information to identify the main issues impacting our water environment.

Some failures may be caused by issues upstream (e.g. over-abstraction or regulation of flow) or downstream (e.g. a weir or dam will prevent migration of fish). These issues occur across catchments and water bodies. In many cases water bodies fail for more than one reason.

Many different co-deliverers need to take action, including land managers, farms and businesses, water companies, the third sector, local communities, planners and public bodies. Where possible, existing mechanisms and measures will be used to engage and deliver sustainable improvements.

Public Authorities are required to deliver their WFD duties and embed the objectives of RBMPs within their strategies and programmes.

The main reasons for failure that Planning Authorities in general can and should address have been identified:

- Artificial barriers to fish migration
- Abandoned mines & contaminated land
- Sewage discharges
- Flood protection & land drainage
- Urban & transport development

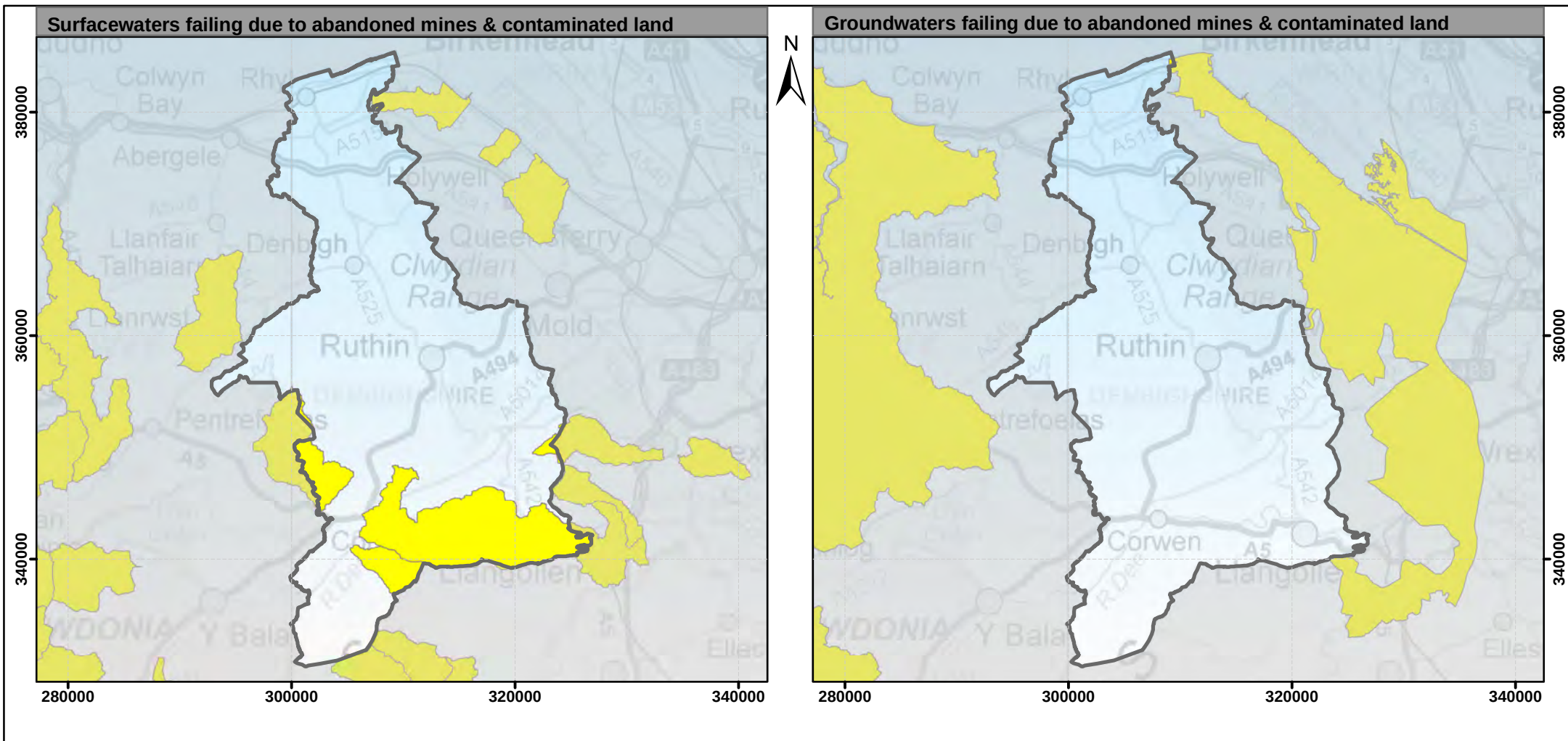
The river catchments where these issues are present in this Planning Authority are shown in the following 6 maps.

All reasons for failure identified in this Planning Authority

The table below shows all of the reasons for failure that have been identified for water bodies in the Planning Authority. (This is the same data as the pie chart on the previous page.)

More information on the reasons for failure is available from your Natural Resources Wales Planning contacts.

Reason for Failure	Number of times reason for failure identified
Abandoned mines and contaminated land	7
Acidification	1
Agricultural pollution	12
Barriers to fish migration	11
Flood protection and land drainage	2
Forestry	6
Impoundments	11
Industrial discharges	2
Natural conditions	6
Septic tanks	2
Sewage discharges	6
Surface water abstraction	1
Urban and Transport development	4
Other	5
Unknown	6



Water Framework Directive Reasons for Failure

Abandoned Mines and Contaminated Land

Legend

- Abandoned mines & contaminated land
- Planning Authority Boundary



What can Local Authorities do?

Barriers to fish migration

- ensure that planning applications that include impoundment, such as Hydroelectric Power Schemes, do not adversely affect water bodies' WFD status

Abandoned mines & contaminated land

- ensure that risks posed to groundwaters from land contamination are mitigated and remediation is put in place where necessary

Sewage Discharges

- work with householders and businesses, along with Natural Resources Wales and water companies, to address misconnections
- work with developers, sewerage undertakers and Natural Resources Wales when developing their Local Development Plans (LDPs) to ensure sufficient sewage capacity exists both for current and future needs
- work with Natural Resources Wales to ensure any planning permissions granted help to deliver the required water quality
- work with water companies and Natural Resources Wales to implement long term planning that accounts for sewerage and development pressures

Flood protection & land drainage

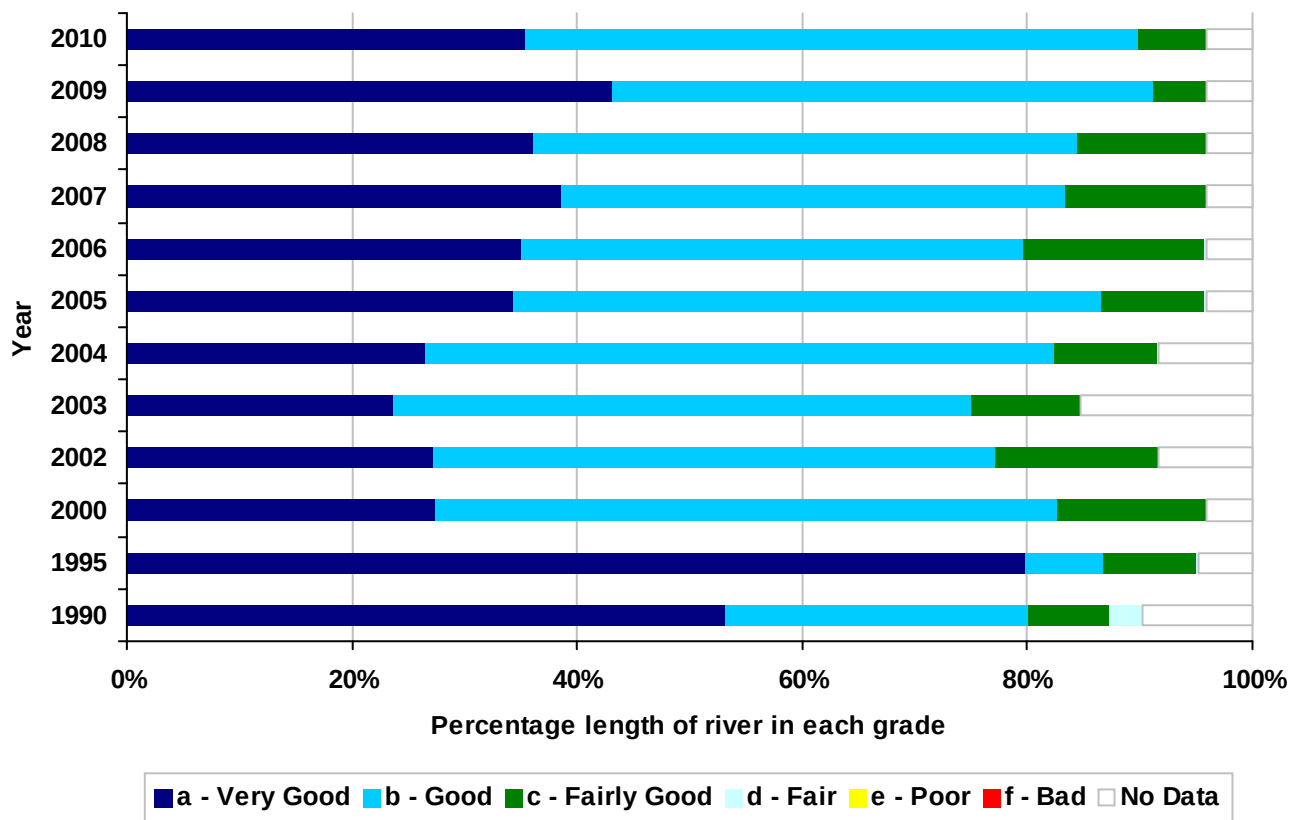
- ensure, along with developers and Natural Resources Wales, that existing and proposed flood protection structures and operations incorporate the required mitigation
- work with Natural Resources Wales to ensure new development is located outside of flood plains
- ensure, along with Natural Resources Wales and land owners, that managed realignment of flood defences delivers environmental improvements where appropriate (e.g. saltmarsh and wetland creation)
- Future SuDS (Sustainable Drainage Systems) Approval Bodies ensure new SuDS deliver solutions for the management of surface water quality and quantity

Urban & transport development

- work with Natural Resources Wales, local communities and the third sector to identify opportunities to restore urban rivers, such as removal of redundant weirs and reinstating riparian habitat and trees
- work with Natural Resources Wales, local communities and water companies to address diffuse pollution and misconnection issues
- ensure that planning decisions take regard of the River Basin Management Plans and support the delivery of environmental improvements.

We will publish an advice note on the Water Framework for Local Authorities in Wales later this year. This will help Local Authorities to have a better understanding of their roles and responsibilities and the actions they can take to contribute to WFD objectives.

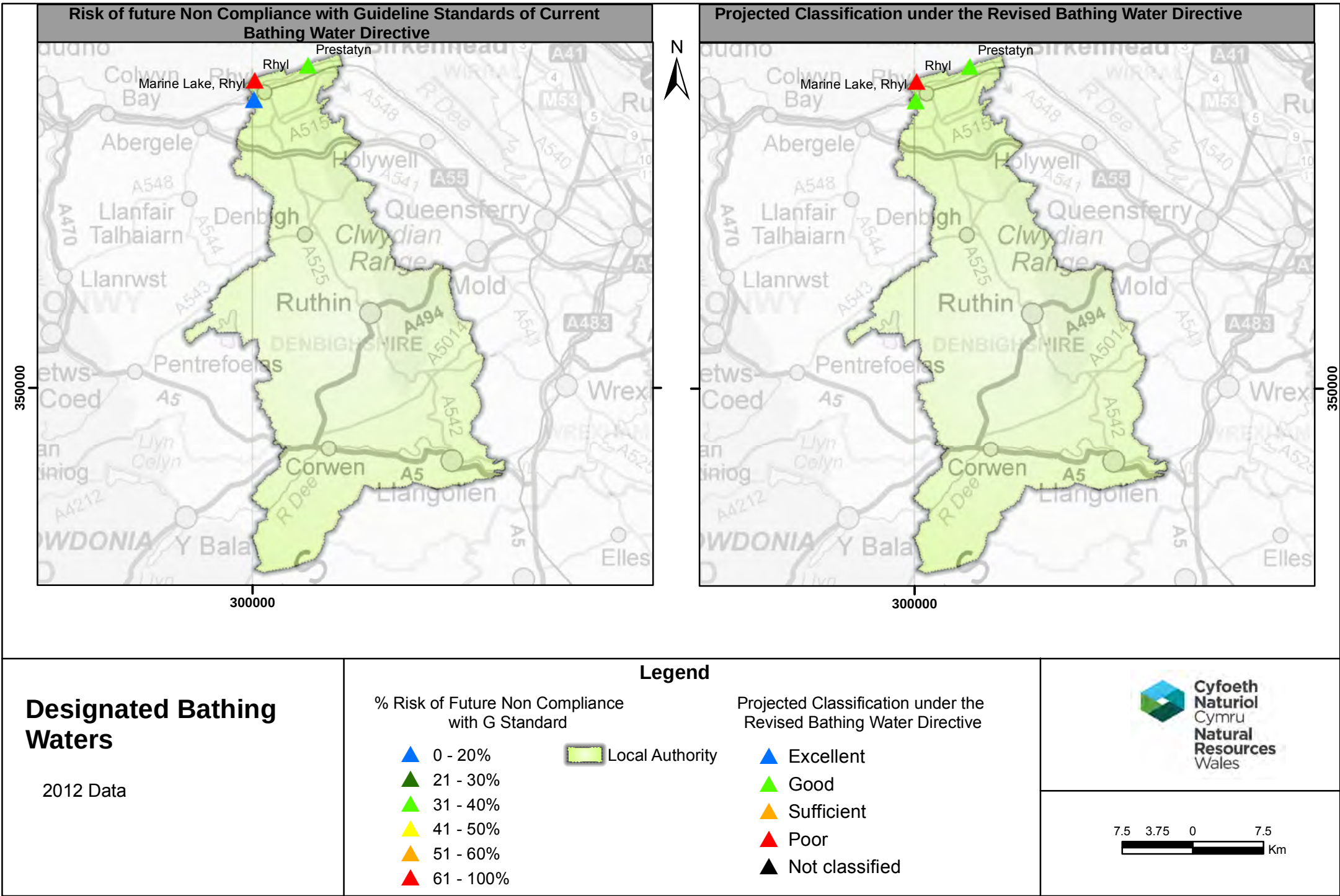
Data Trends: GQA Biology



The General Quality Assessment (GQA) scheme was our previous scheme for assessing water quality. GQA has now been superseded by the Water Framework Directive. 2010 was the last year that GQA was reported.

GQA biology historical trends are shown here for reference. This graph shows the percentage length of the classified river network achieving each GQA grade for biology.

Each bar represents 100% of the classified river and canal network for a year. This bar is divided into bands according to the proportion of the length of the network achieving each grade. The bands are stacked from left to right from Grade a (very good) to f (bad) and then No Data (un-graded). A length of river will be un-graded for biology if the channel is unsuitable for the sampling techniques. The un-graded sections will include canals and drainage ditches as well as the deeper, lower sections of some rivers.



Bathing Waters: Water Quality

The map on the left on the previous page shows the future risk of non compliance with the Guideline standards of the current bathing water directive for designated bathing waters, predicted using the 2008 to 2012 dataset.

The map on the right shows the projected classification of designated bathing waters under the revised Bathing Water Directive, based on 2009 to 2012 dataset.

Changes to the EU Bathing Water Directive

The **current Bathing Water directive** (cBWD) specifies a range of water quality standards that should be achieved in designated bathing waters. These standards fall into two categories: mandatory and guideline (G) standards. Compliance with the guideline standards is not mandatory but the directive states that member states should "endeavour" to observe them as guidelines.

The **revised Bathing Water Directive** (rBWD) entered into European Law in March 2006 and was translated into UK Bathing Water regulations in April 2008. The new features of the revised directive will take longer to come into effect. The revised directive should be fully in operation by 2015.

The rBWD makes changes to the monitoring and classification of bathing waters, the management of bathing water quality and the provision of data to the public. The rBWD requires close co-ordination with, and complements the Water Framework Directive.

Bathing water classifications will be based on 4 years of data. There will be 4 classes - EXCELLENT, GOOD, SUFFICIENT and POOR - and stricter microbiological standards.

EXCELLENT	– approximately twice as stringent as the current guideline standard
GOOD	– similar to the current guideline standard
SUFFICIENT	– tighter than the current mandatory standard
POOR	– non-compliant

An objective is set in the directive for all bathing waters to achieve SUFFICIENT status by 2015.

Beach Awards

Until 2013, Guideline water quality was a requirement for **Blue Flag and Green Coast beach awards**. 2012 was the last year that both Blue Flags and Green Coast Award were awarded according to the standards of the current Bathing Water Directive. From 2013 the water quality criteria for these awards is the Excellent classification of the revised Bathing Water Directive.

More information about bathing waters can be found in the Wales Bathing Waters Report

http://environment-agency.gov.uk/static/documents/EAW_WSR_December_2012.pdf

and on the Welsh Government website

<http://wales.gov.uk/topics/environmentcountryside/epq/waterflooding/bathingwater/>

and the Natural Resources Wales website

<http://naturalresourceswales.gov.uk/out-and-about/enjoy-the-outdoors-/bathing-water-quality/>

Bathing Waters: Risk of Non-compliance

Risk of non-compliance with Guideline standards

At the end of each Bathing season a percentage risk of non-compliance is calculated for each bathing water.

Compliance in one particular year is an unreliable indication of trends. Variation in compliance from year to year is expected and does not necessarily indicate genuine improvement or deterioration, owing to the statistical limitations of using such a small data set. There will always be some beaches that change their status as a result of marginal failures or passes. The rBWD goes some way to mitigating these effects as classifications are based on four years of sampling data rather than just one.

Actions that Local Authorities can take

- Evaluate the impact that poor bathing water quality may have on your local economy.
- Work with your water companies and Natural Resources Wales to explore options to improve bathing water quality.
- Work with your local community to gain support and commitment. This can include tourism businesses, local farmers, local groups and charities.
- If your bathing waters are predicted to be good or excellent, consider how to improve and maintain this status.

The percentage risk of non-compliance can be interpreted as follows:

%age Risk of Non-Compliance

Predicted Compliance

< 10

Would be expected to achieve G compliance 9 out of 10 bathing seasons on average

10-20

Would be expected to achieve G compliance 8 out of 10 bathing seasons on average

The above should be considered as the relatively consistent G compliance achievers and will include the bathing waters which achieve Blue Flags generally year on year.

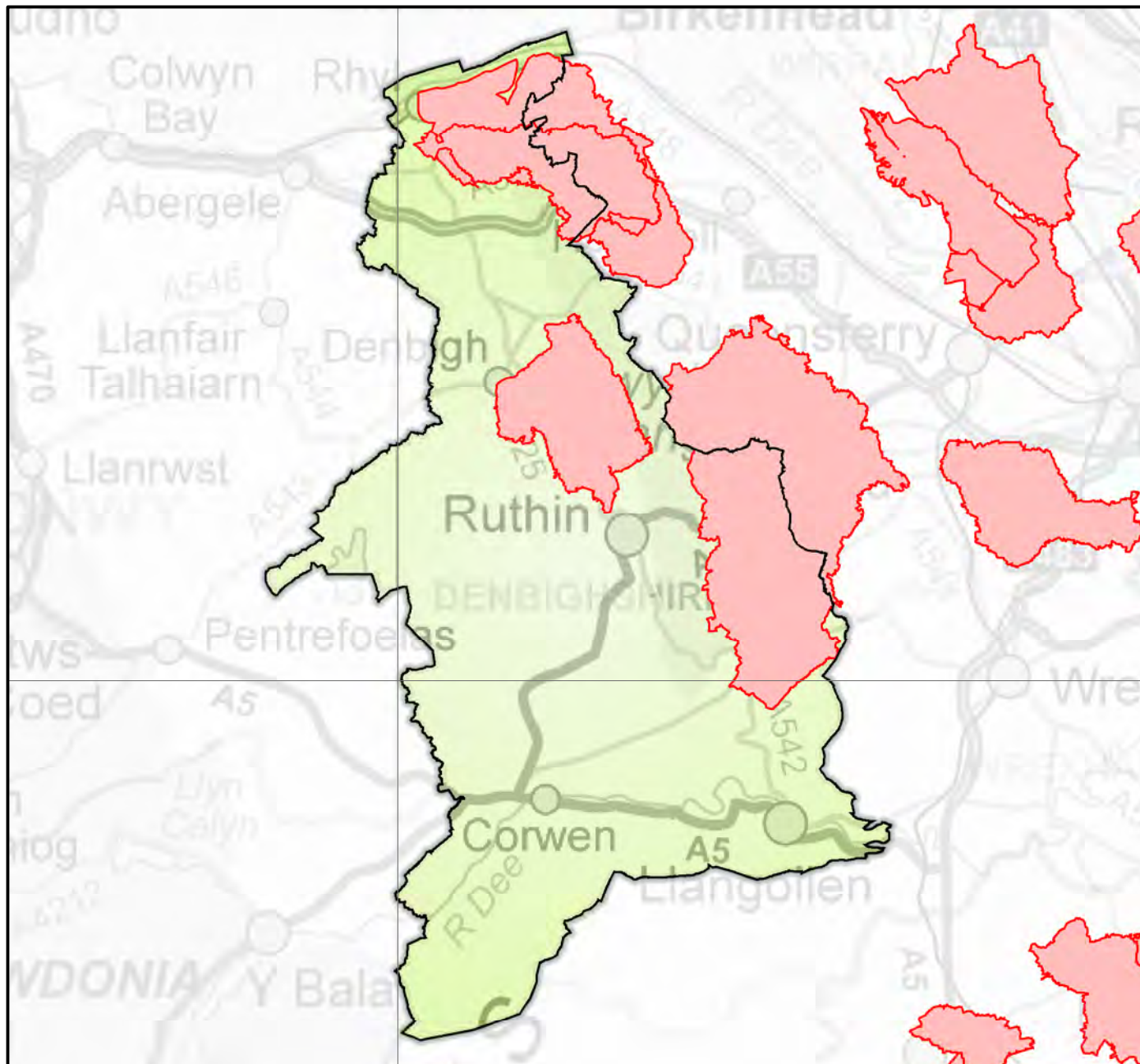
21-50

Would be expected to achieve G compliance 5 to 7 times out of 10 bathing seasons. Could reasonably be expected to improve with investment and other measures to achieve consistent G compliance

> 50

Would be expected to achieve G compliance < 5 times out of 10 bathing seasons. None or only occasional G compliance achieved.

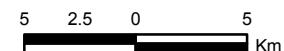
More information about bathing waters, including bathing water profiles and water quality data, is available on the Environment Agency Bathing Water Data Explorer <http://environment.data.gov.uk/bwq/explorer/>



Nitrate Vulnerable Zones (NVZ)

Legend

- NVZs
- Local Authority



Nitrate Vulnerable Zones (NVZ) in Denbighshire

Nitrate Vulnerable Zones

The Nitrates Directive is designed to reduce water pollution caused by nitrate from agriculture.

The directive requires Defra and the Welsh Government to identify surface or groundwaters that are, or could be high in nitrate from agricultural sources.

Surface waters also have to be identified if too much nitrogen has caused a change in plant growth which affects existing plants and animals and the use of the water. Increased nitrate levels can lead to the eutrophication of an ecosystem where plant species that are more tolerant of higher nitrogen levels dominate, reducing plant diversity, both on terrestrial sites and in the freshwater environment. A reduction in plant diversity will have knock on effects where fauna diversity will also decrease.

Once a water body has been identified, all land draining to that water is designated as a Nitrate Vulnerable Zone. Within these zones, farmers must observe an action programme of measures which include restricting the timing and application of fertilisers and manure, and keeping accurate records.

In Wales less than three per cent of land is designated as a Nitrate Vulnerable Zone, whereas more than half of England is designated.

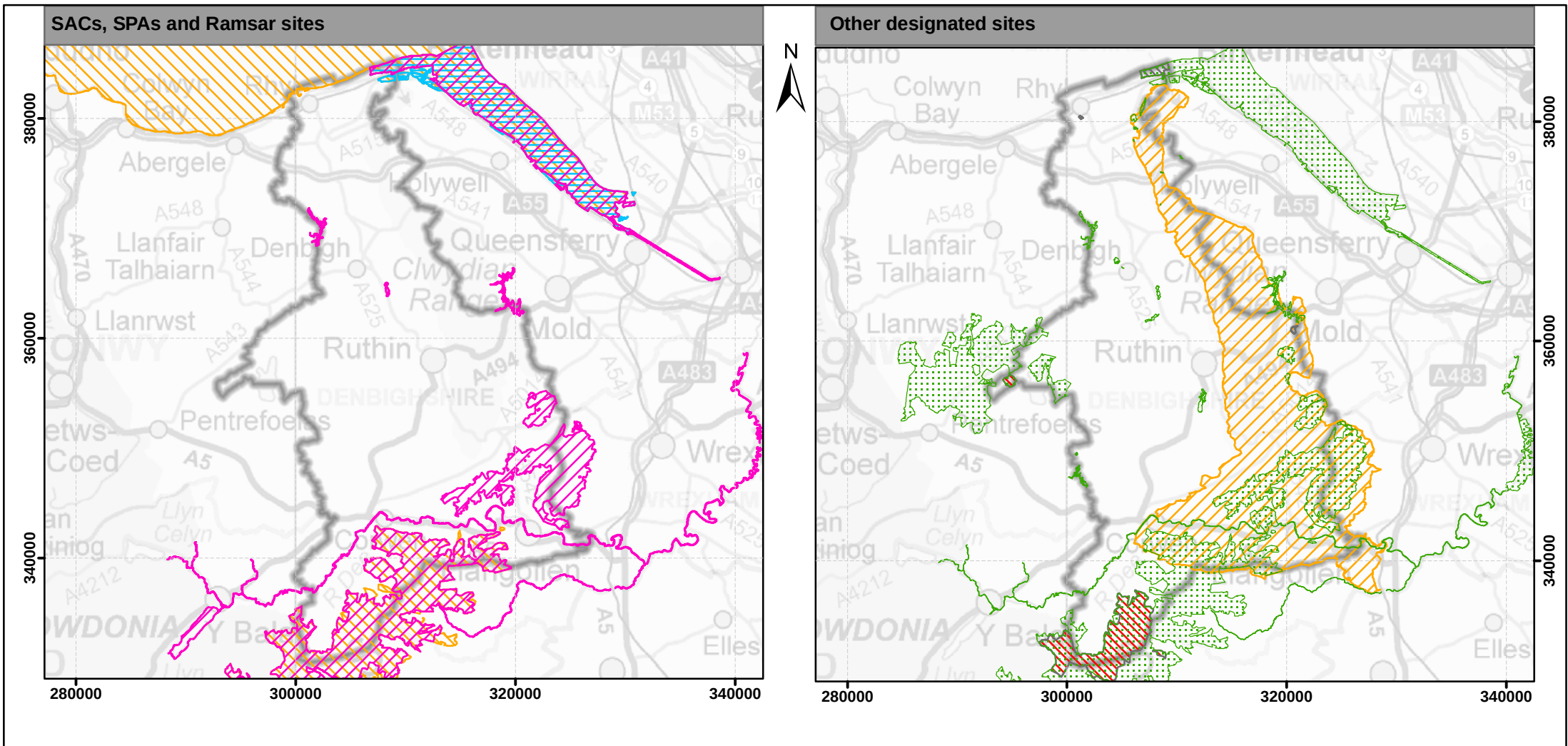
More Information

For more information visit the GOV.UK website

<https://www.gov.uk/nitrate-vulnerable-zones>

or the Welsh Government website

<http://wales.gov.uk/topics/environmentcountryside/epg/waterflooding/nitratezones/>



Designated Protected Sites

Special Protection Areas (SPAs)

The EC Birds Directive of 1979 requires member states to establish Special Protection Areas to conserve the habitats of two categories of birds: species which are rare or vulnerable, of which there are forty-eight in the UK; and some migratory species which visit our shores regularly.

Special Areas of Conservation (SACs)

SACs are designated under the EC Habitats Directive. They help to maintain the variety of wildlife by protecting vulnerable habitats and the plants and animals that they support.

Ramsar Sites

These are sites identified under the Ramsar Convention on Wetlands of International Importance. These wetlands are of key importance to the survival of many wetland plants and animals. They are vital for many types of birds particularly waterfowl. Wetland sites can be areas of marsh, fen, peatland or open water; natural or artificial; permanent or temporary; with water that is fresh, brackish or salty. They can also include shallow areas of sea.

Heritage Coast

Heritage Coasts are stretches of outstanding, unspoilt coastline. They occupy about 500 km of the Welsh coastline. They were set up to protect our coastlines from insensitive developments. Their status carries no legal protection, but planning authorities must take the designation into account when making decisions on development. Management of Heritage Coasts is the remit of the local authority.

Sites of Special Scientific Interest (SSSIs)

SSSIs are the cornerstone of wildlife and habitat protection in Wales and are backed by law. There are more than 1,000 of them. An SSSI may be made on any area of land which is considered to be of special interest by virtue of its fauna, flora, geological or physiographical / geomorphological features. SSSIs in Wales cover a wide range of habitats from small fens, bogs and riverside meadows to sand dunes, woodlands and vast tracks of uplands. Local planning authorities are required to consult with Natural Resources Wales before allowing any development to proceed that may affect an SSSI.

Areas of Outstanding Natural Beauty (AONBs)

Areas of Outstanding Natural Beauty (AONB's) are designated under national legislation in recognition of the outstanding qualities of their 'natural beauty'. The primary purpose of designation is to secure the conservation and enhancement of their 'natural beauty' which includes protecting flora, fauna, and geological as well as landscape features. The Countryside and Rights of Way Act 2000 requires all relevant authorities to have regard to the purpose of conserving and enhancing the natural beauty of AONBs when performing their functions.

National Nature Reserves (NNRs)

National Nature Reserves represent the very best examples of our wildlife, habitats and geological features. Most NNRs are also SSSI.

Marine Nature Reserves (MNRs)

Marine Nature Reserves are a way of conserving important marine habitats and wildlife, and other features along the shore or on the seabed. Skomer is currently the only MNR in Wales.

Local Nature Reserves (LNRs)

Local Nature Reserves are established and managed by local authorities. LNRs have natural features of special interest to the local area. LNR are useful not only to protect habitats and wildlife but increase people's awareness of their environment. They are often situated in or near urban areas.

Biosphere Reserves

Biosphere Reserves are designated by UNESCO. Each reserve is part of a world-wide chain of permanently protected areas dedicated to studying the way human activity affects the local environment. Wales has one biosphere reserve.

Biogenetic Reserves

Biogenetic reserves are part of a European network of reserves that aims to conserve plants, animals and natural areas that may be common in one country, but scarce in another by protecting the store of genetic material for the future. Sites have to be SSSIs or similar. Wales has one biogenetic reserve.

Landscape, Open Access Land and Protected Species and Habitats data

Designated protected sites

Further data and information about protected sites is available from The Countryside Council for Wales website www.ccw.gov.uk

Protected species data

Data and information about protected species is available from your Natural Resources Wales planning contact and from the following links:

The Countryside Council for Wales website www.ccw.gov.uk

The National Biodiversity Network Gateway <http://data.nbn.org.uk/>

The Local Records Centres Wales website www.lrcwales.org.uk

South East Wales Biodiversity Records Centre (SEWBReC)
<http://www.sewbrec.org.uk/>

West Wales Biodiversity Information Centre (WWBIC)
<http://www.wwbic.org.uk/>

Biodiversity Information Service for Powys and Brecon Beacons National Park (BIS) <http://www.b-i-s.org/index.php>

Cofnod, North Wales Environmental Information Service
<http://www.cofnod.org.uk/About>

LANDMAP is an interactive map showing landscape characteristics and qualities and influences on the landscape in Wales. It includes five datasets: Geological Landscape; Landscape Habitats; Visual & Sensory; Historic Landscape and Cultural Landscape. Using the five datasets of information together promotes sustainable landscape decision-making. LANDMAP is the formally adopted methodology for landscape assessment in Wales and informs planning related uses and landscape baseline conditions at both local and landscape scale. It provides a useful starting point for the assessment of cultural services. It is regularly updated and therefore forms a useful baseline against which to monitor long-term change.

The LANDMAP website

<http://www.ccw.gov.uk/landscape--wildlife/protecting-our-landscape/landmap.aspx>

GIS downloads

<http://www.ccw.gov.uk/interactive-maps/gis-download-welcome/gis-boundary-downloads.aspx>

Register of Landscapes of Historic Interest in Wales

This is a non-statutory register that has been compiled by the Countryside Council for Wales, Cadw and the International Council for Monuments and Sites (ICOMOS). It is a good source of information about landscape history, and it can be used to help assess the impact of development proposals on the historic landscape. Planning Policy Wales states that local planning authorities should take the Register into account in preparing their development plans. Further information and an interactive map:

<http://www.ccw.gov.uk/landscape--wildlife/protecting-our-landscape/historic-landscapes.aspx>

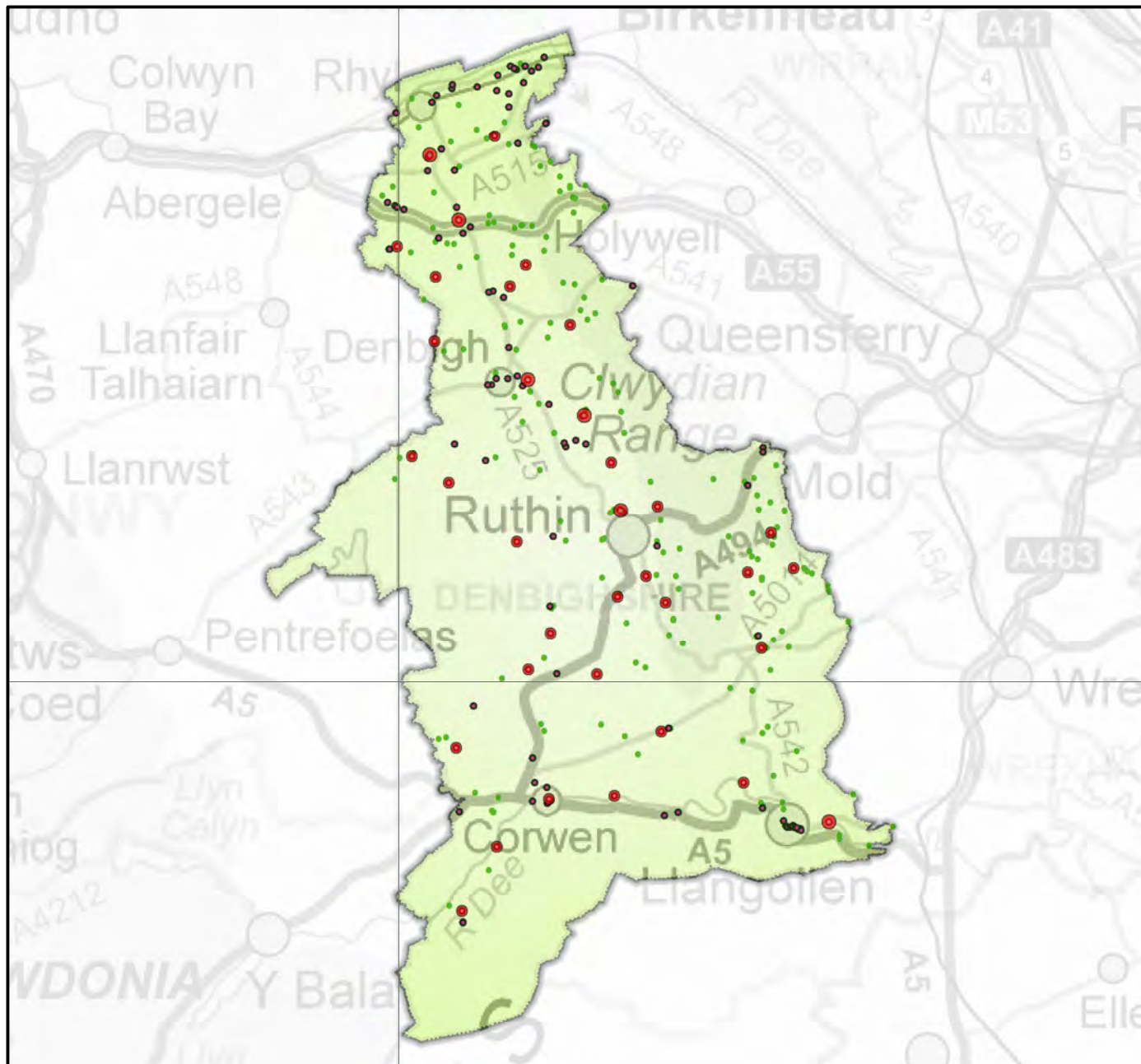
Open Access Land

Open access land in Wales is identified under the Countryside and Rights of Way Act (CROW). About 20% of Wales is mapped as 'access land' where the public have a right of access on foot.

Access land is mostly open country; mountain, moor, heath and downland. It also includes 'registered common land' (land that is recorded on the official registers held by the commons registration authorities) and areas of 'dedicated public forests' where owners such as Natural Resources Wales allow free access.

To implement the CROW Act, the Countryside Council for Wales produced accurate maps of all open access land. These maps are currently under review. Provisional maps are available at <http://www.ccw.gov.uk/enjoying-the-country/open-access-land/open-access-maps.aspx>.

Final maps will be published in September 2014.



Permitted Discharges to Controlled Waters

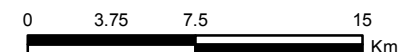
Legend

Welsh Water Discharges Dry Weather Flow (m3/day)

- 0 - 1000
- 1000 - 4000
- 4000 - 8000
- 8000 - 18000
- 18000 - 44000
- 44000 - 310000
- Welsh Water no DWF

Other Discharges

- Active
- Not yet effective
- Local Authority Boundary



Permitted Discharges to Controlled Waters and Permitted Industrial Sites in Denbighshire

Environmental Permits

The Environmental Permitting (England and Wales) Regulations 2010, introduced in April 2010, have produced a single regulatory framework by streamlining and integrating:

Waste Management Licensing

Pollution Prevention and Control

Water Discharge Consenting

Groundwater Authorisations

Radioactive Substances Regulation

These activities will now all have Environmental Permits (EPR permits)

Permitted Discharges to Controlled waters

Natural Resources Wales has a wide range of responsibilities under legislation to protect and improve the water environment. As part of these responsibilities we actively monitor the quality of watercourses and groundwaters.

Controlled waters include inland freshwaters, groundwaters, tidal waters and coastal waters up to 3 nautical miles out to sea.

Natural Resources Wales now regulates discharges to controlled waters using Environmental Permits. The permit allows the holder to discharge into controlled waters. The permit details the conditions under which the discharge can be made, including the amounts and concentrations of specific pollutants the operator can release into controlled waters.

The Permitted Discharges to Controlled Waters map on the previous page shows locations of all current discharge consents. Dwr Cymru Welsh Water (DCWW) consents to discharge are symbolised according to the consented dry weather flow (DWF). This can be taken as an indication of the size of the discharge.

Permitted Industrial Sites

The following map and table show the location of permitted industrial sites in the planning authority.

Natural Resources Wales uses environmental permits to control emissions from industrial processes that have the potential to pollute. These permits set limits to control the level of pollutants that can be released to air, land or water from a particular site, and may require the site operator to carry out processes in accordance with stated conditions.

Permitted processes can include; complex process industries (chemical or cement works and power stations), sewage treatment works, waste management facilities (landfill sites and incinerators) and industries that use radioactive material.

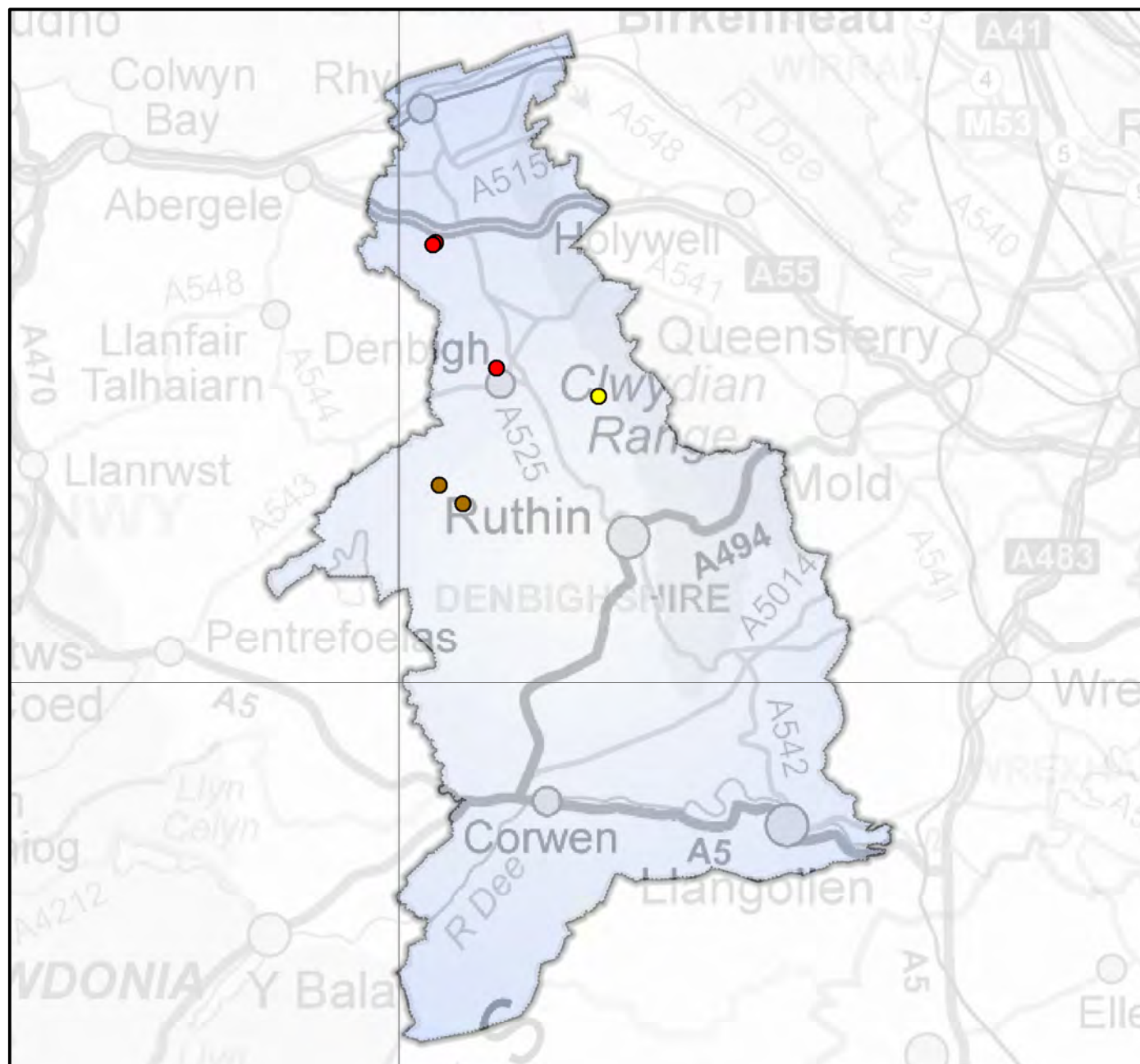
Part 2 of Schedule 1 of the Environmental Permitting Regulations separates the permitted sectors into Part A(1), Part A(2) or Part B activities.

Part A(1) activities are regulated by the Natural Resources Wales.

Part A(2) and Part B activities are regulated by local authorities.

Further information on the Natural Resources Wales website:

<http://naturalresourceswales.gov.uk/apply-buy-report/apply-buy-grid/installations/>



Permitted Industrial Sites

Legend

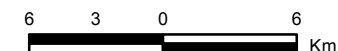
Industrial sites

- Other activity

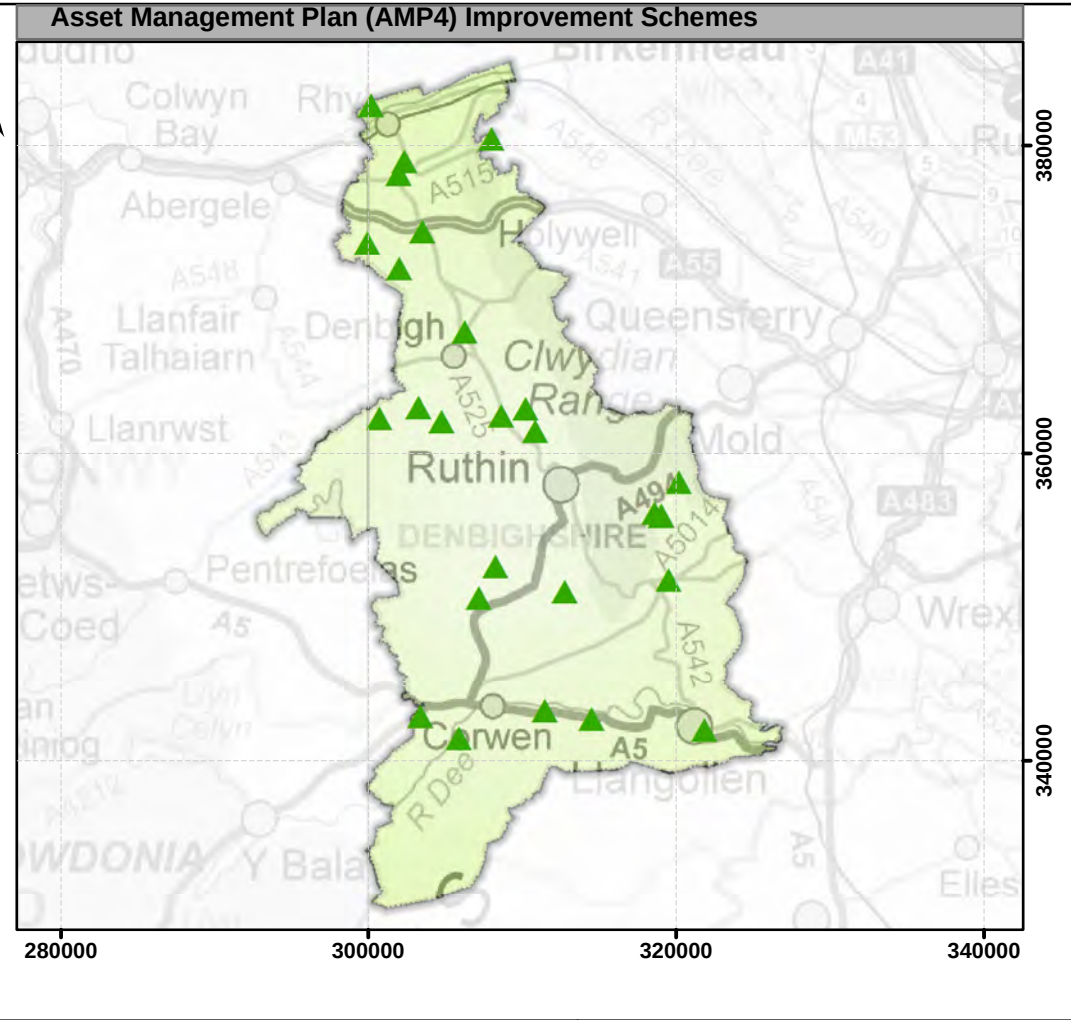
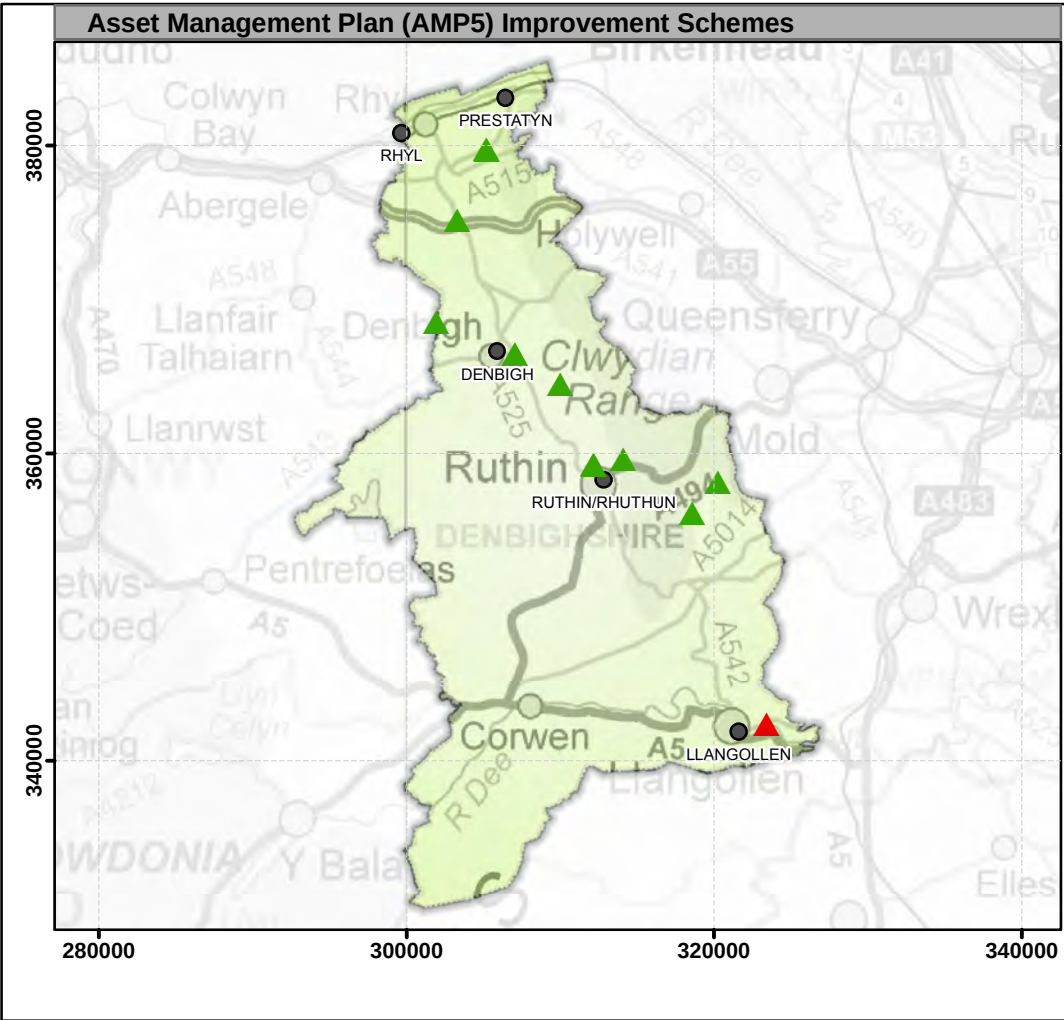
Activity

- Agriculture
- Cement & Minerals
- Chemicals
- Combustion
- Energy from Waste
- Food & Drink
- Landfill
- Metals
- Paper, Pulp & Textiles
- Refineries
- Waste Storage

- Local Authority Boundary



Permitted Industrial Sites					
Original Permit No.	Site Name	Operator	Address	National Grid Reference	Activity
BP3630NH	LLANDYRNOG CREAMERY	Arla Foods Ltd	Llandyrnog Creamery,.,Llandyrnog,Denbigh,LL16 4HH	SJ10906560	Food & Drink
BX4666IZ	St Asaph Infra Red Optics	Qioptic Ltd	GLASCOED ROAD,ST. ASAPH,ST. ASAPH,LL17 0LL	SJ02007400	Chemicals
JP3535SG	Denbigh Bolus Plant	Telsol Ltd	23-24 Rhyl Road,Colomendy Industrial Estate,Denbigh,LL16 5TA	SJ05346717	Chemicals
JP3536LS	St Asaph Lens Coating	Qioptiq Ltd	Glascoed Road,ST. ASAPH,LL17 0LL	SJ01877389	Chemicals
XP3831MZ	Bryn Golau	2 Agriculture Limited	Bryn Golau,Saron,Denbigh,LL16 4TH	SJ02206080	Agriculture
YP3531MK	PEN-Y-FFRITH	2 Agriculture Limited	Pen y Frith Farm,Saron,DENBIGH,LL16 4SW	SJ03485980	Agriculture



Dwr Cymru Welsh Water Asset Management Plans

AMP4 (2005-2010) and
AMP5 (2010-2015)

(completion status as at
end March 2013)

Legend

AMP5 Schemes

Completed



Y



N



Towns

AMP4 Schemes

Completed



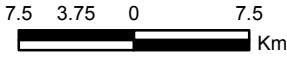
Y



N



Local Authority



AMP4 Improvement Schemes, 2005-2010

Scheme/Discharge Name	Drivers	Completed
FOUR CROSSES STW, GLANYRAFON	Groundwater	Y
NANTYGLYN STW	Urban Waste Water Treatment Directive	Y
BATHING WATERS: RHYL/SANDY COVE CATCHMENT	Bathing Waters	Y
LLANARMON-YN-IAL STW STORM	Urban Waste Water Treatment Directive	Y
CLAWDDNEWYDD STW - SETTLED STORM	Urban Waste Water Treatment Directive	Y
LLANGOLLEN PUMP STATION (STW CSO)	Urban Waste Water Treatment Directive	Y
DENBIGH THE GREEN	Urban Waste Water Treatment Directive	Y
KERFOOT AVENUE, RHUDDLAN	Urban Waste Water Treatment Directive	Y
GWINDY STREET, RHUDDLAN	Urban Waste Water Treatment Directive	Y
ETON PARK, RHUDDLAN	Urban Waste Water Treatment Directive	Y
MAES ALAW, RHUDDLAN	Urban Waste Water Treatment Directive	Y
GAMEKEEPER PH LOWER ST ST ASAPH	Urban Waste Water Treatment Directive	Y
PS NR. GWAENYSGOR	Groundwater	Y
LLANYNYS STW	Groundwater	Y
LLANARMON YN IAL STW	River Quality Objectives, Urban Waste Water Treatment Directive	Y
Llanarmon Maes Llan	Groundwaters	Y
Gwalia Cottages	Groundwaters	Y
Derwen	Groundwaters	Y
Llidiart y Parc	Groundwaters	Y
Maerwen Cefn	Groundwaters	Y
Bro Meudwy	Groundwaters	Y

Scheme/Discharge Name	Drivers	Completed
PRION STW	Groundwater	Y
WwTW Lynton	Groundwaters	Y
PENIEL STW	Groundwater	Y
LLANARMON-YN-IAL STW	Groundwater	Y
PENYSTRYD STW	Groundwater	Y
MARLI GLASCOED STW	Groundwater	Y
ERYRYS, SDW F.E.	Groundwater	Y
PENRALLT STW GLYNFRDWY	Groundwater	Y
Rhyl	Bathing Waters Directive	Y
WwTW Maes Hwylfa Llanrhaeadr	Groundwaters	Y
Completed status is as of end March 2013		

AMP5 Improvement Schemes, 2010-2015

Scheme/Discharge Name	Drivers	Water Body Type	Water Body Name	Completed
Llanbedr STW	Water Framework Directive Chemicals Investigation	River	Dwr Ial	Y
RUTHIN STW SETTLED STORM	Revised Bathing Waters Directive	Coastal	North Wales	Y
RUTHIN STW CSO	Revised Bathing Waters Directive	Coastal	North Wales	Y
LLANDYRNOG STW STORM	Revised Bathing Waters Directive	Coastal	North Wales	Y
Henllan (nr Denbigh) STW CSO asset 2982	Revised Bathing Waters Directive	Coastal	North Wales	Y
DYSERTH STW STORM	Revised Bathing Waters Directive	Coastal	North Wales	Y
Llanarmon Maes Llan STW	Groundwater Directive & Groundwater Daughter Directive	Groundwater	Clwyd Silurian	Y
ST ASAPH STW	Water Framework Directive Chemicals Investigation	Coastal	North Wales	Y
DYSERTH STW	Revised Bathing Waters Directive	Coastal	North Wales	Y
DENBIGH STW STORM	Revised Bathing Waters Directive	Coastal	North Wales	Y
DENBIGH STW	Revised Bathing Waters Directive	Coastal	North Wales	Y
LLANGOLLEN WWTW	Habitats Directive Improvements	River	Dee - Ceiriog to Alwen	N
ERYRYS, SDW F.E.	Groundwater Directive & Groundwater Daughter Directive	Groundwater	Dee Carboniferous Limestone	Y
Completed status is as of end March 2013				

AMP4 Programme for 2005-10 and AMP5 Programme for 2010-2015

Ofwat are the economic regulator for the water industry. Their main role is to seek value for money for water industry customers. Natural Resources Wales, along with the Drinking Water Inspectorate, are responsible for the environmental regulation of the water industry in Wales.

Ofwat sets the price limits that water companies can charge their customers for the supply of water and the treatment of waste water for the following five years. This happens every 5 years and is known as a Periodic Review. In November 2009, following price review PR09, Ofwat set the prices that water companies will charge their customers between 2010 and 2015.

The Periodic Review also determines how much investment water companies can spend on maintaining and improving their services. As part of the price review the water companies, working with Natural Resources Wales, the Drinking Water Inspectorate and other interested stakeholders, develop a programme of environmental and water quality improvements to be delivered in the next 5 years. The resulting investment programme is known as an Asset Management Plan or AMP and includes the National Environment Programme that has been drawn up by Natural Resources Wales.

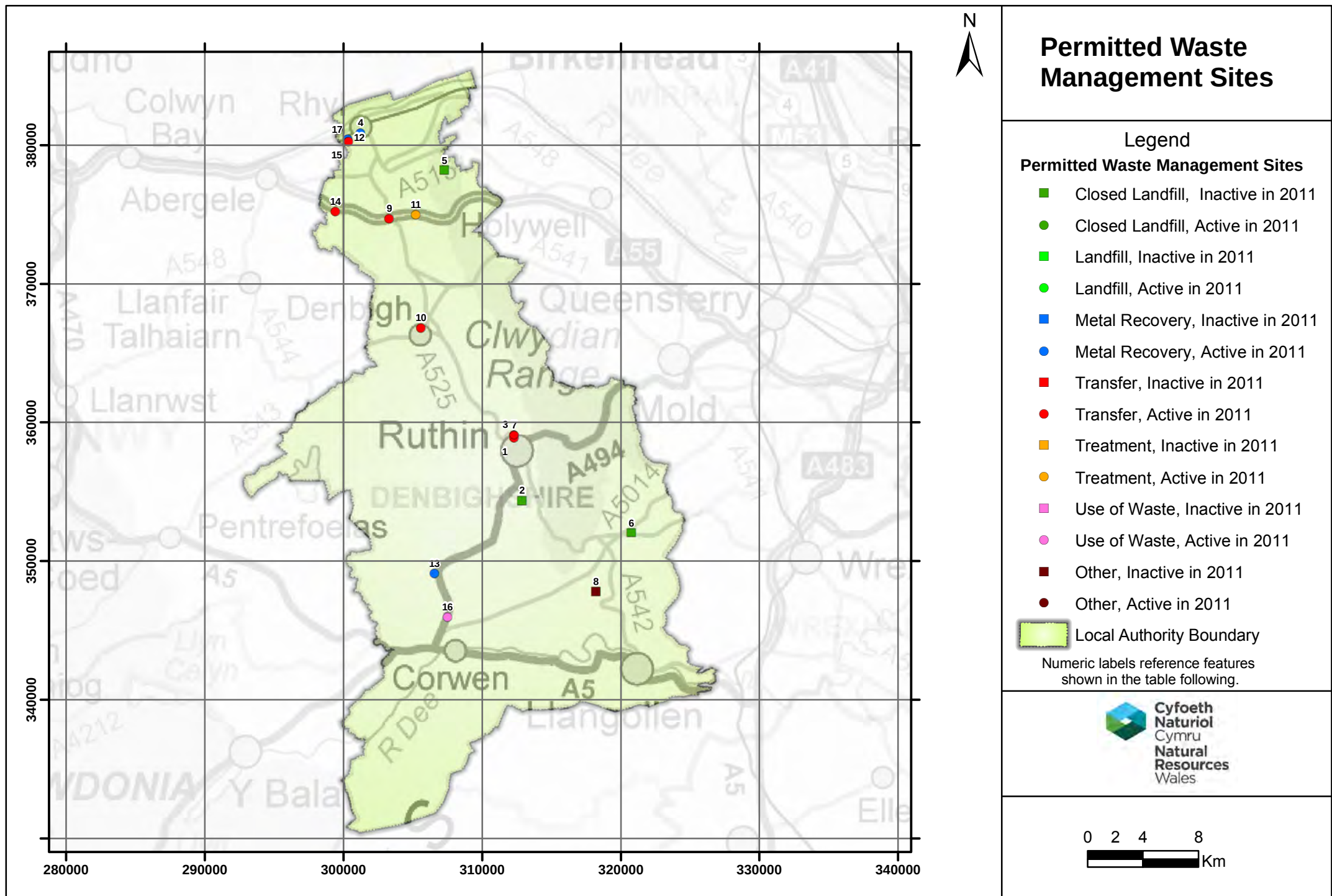
The current AMP, AMP5, runs from 2010 to 2015. The previous programme, AMP4, ran from 2005 to 2010.

The Asset Management Plan (AMP4) Improvement Schemes map on the previous page shows assets owned by Dŵr Cymru which were identified for improvement during AMP4 (2005-2010). It also shows which schemes have been completed. The Asset Management Plan (AMP5) Improvement Scheme map shows assets owned by Dŵr Cymru which were identified for improvement during AMP5 (2010-2015). It also shows which schemes have been completed.

Links to further information:

Dwr Cymru/Welsh Water website www.dwrcymru.co.uk

Ofwat website www.ofwat.gov.uk



Permitted Waste Management Sites

Label No.	Permit No.	Site Name	Category	Active in 2011?
1	37018	Min Y Clwyd Yard	Transfer	Y
2	37020	Plas Einon Quarry	Closed Landfill	
3	37054	Ruthin Civic Amenity Site	Transfer	Y
4	37078	Rifkins Yard	Metal Recovery	Y
5	37093	Marian Ffrith Landfill	Closed Landfill	
6	37115	Moel Garregog	Closed Landfill	
7	37122	Ruthin Waste Transfer Station	Transfer	Y
8	37125	Moel Y Faen Quarry	Other Waste Operation	
9	37128	City Skips Transfer Station	Transfer	Y
10	37202	Denbigh Civic Amenity Site	Transfer	Y
11	37258	K M Environmental Ltd	Treatment	Y
12	37261	Cambrian Autoparts Northwest Limited	Metal Recovery	Y
13	37263	Lelo Metal Recycling Ltd	Metal Recovery	Y
14	100848	Kinmel Park Depot	Transfer	Y
15	101675	Rhyl Recycling Park	Transfer	Y
16	101950	Isfryn Field	Use of Waste	Y
17	103823	Foryd Harbour	Use of Waste	

Waste Management Sites

Waste Management Sites

Waste Management Licensing was one of the regulatory systems used to regulate the waste management industry. We now regulate waste and other industries under one system, Environmental Permitting Regulations. Operations that previously had a Waste Management Licence (WML) will now have an Environmental Permit.

The Permitted Waste Management Sites map shows the locations of permitted waste management sites as in November 2012. These sites have a current permit for waste management activities, but may not be currently accepting waste. Those waste management sites that received waste during 2011 have been shown as active.

Sources of Waste Management Data and Information

Waste Data Interrogator and Reporting Tool

The Waste Data Interrogator contains details of all waste deposited and removed from permitted waste facilities in England and Wales for a given year, including hazardous waste, but not waste from exempted facilities such as land spreading or exempt scrap yards. This tool is primarily designed to provide data for waste planners and waste management professionals for undertaking strategic waste management assessments and general waste flow analysis.

Hazardous Waste Interrogator

The Hazardous Waste Interrogator 2011 lets you view and analyse detailed information from our hazardous waste database. You can find data on the different types and quantities of waste produced, where it is produced and deposited, and how it is disposed of and recovered in England and Wales.

The Waste Data Interrogator and the Hazardous Waste Interrogator may be downloaded from our DataShare website.

There is an annual summary of the types and quantities of waste handled by permitted waste management facilities in Wales on the Environment Agency website.

Other waste data and information

The **Landfill Allowances Scheme** (Wales) Regulations 2004 (The LAS regulations) came into force in Wales on 1 October 2004, to reduce the amount of biodegradable municipal waste going to landfill sites. Landfilling biodegradable municipal waste, for example food, paper, and garden waste, can contribute to environmental problems such as leachate production - liquid that drains or 'leaches' from a landfill. It also releases methane, a potent greenhouse gas, which can contribute to climate change.

Wales waste data information 2011

<http://www.environment-agency.gov.uk/research/library/data/142825.aspx>

Details of how to get the interrogators and an explanation of where the waste data comes from

<http://www.environment-agency.gov.uk/research/library/data/142777.aspx>

Further information about the Landfill Allowances scheme

<http://naturalresourceswales.gov.uk/our-work/policy-advice-guidance/waste-Policy/landfill-allowance-scheme/>

Report on the Landfill Allowances Scheme (LAS) Wales 2012-13

<http://naturalresourceswales.gov.uk/content/docs/pdfs/our-work/Policy-advice-and-guidance/87161/landfill-allowances-2012-13>

Data and information about **fly-tipping** is available on the Welsh Government website

<http://wales.gov.uk/topics/statistics/headlines/environment2012/120816/>

Waste: Remaining Landfill Capacity and Landfill Inputs

Landfill Directive site classification

The implementation of the Landfill Directive introduced many new requirements. Under the Directive, landfills were classified into three main types: Hazardous waste; Non-hazardous waste and Inert waste.

Some non-hazardous landfills can also have a separate hazardous waste cell for Stable Non Reactive Hazardous Wastes (SNRHW), e.g. asbestos and gypsum. This cell is usually a very small part of the overall site. There is only one of these in Wales.

There are also detailed restrictions on the waste (i.e. Waste Acceptance Criteria) that each class of landfill can take.

Landfill Inputs

A total of 2.2 million tonnes of waste was landfilled in Wales in 2011. This is a 4% reduction compared to the 2.3 million tonnes of waste sent to landfill during 2010. The total tonnage of waste landfilled in Wales has fallen by 51% since 2001.

65% of the waste that was landfilled in 2011 was HIC (Household, Industrial & Commercial) waste, 35% was inert/C&D (Construction & Demolition) waste and approximately 130 tonnes (<0.001%) was hazardous waste (consisting of mainly ashes and slags from power stations and metal manufacture).

Landfill Capacity

There was 35.1 million cubic metres of remaining capacity at permitted landfill sites in Wales at the end of 2011. This would provide nearly 10 years of landfill life for non-hazardous waste at 2011 rates of disposal.

Overall capacity decreased by 7 per cent compared to 2010. No additional landfill capacity was created this year.

At the end of 2011:

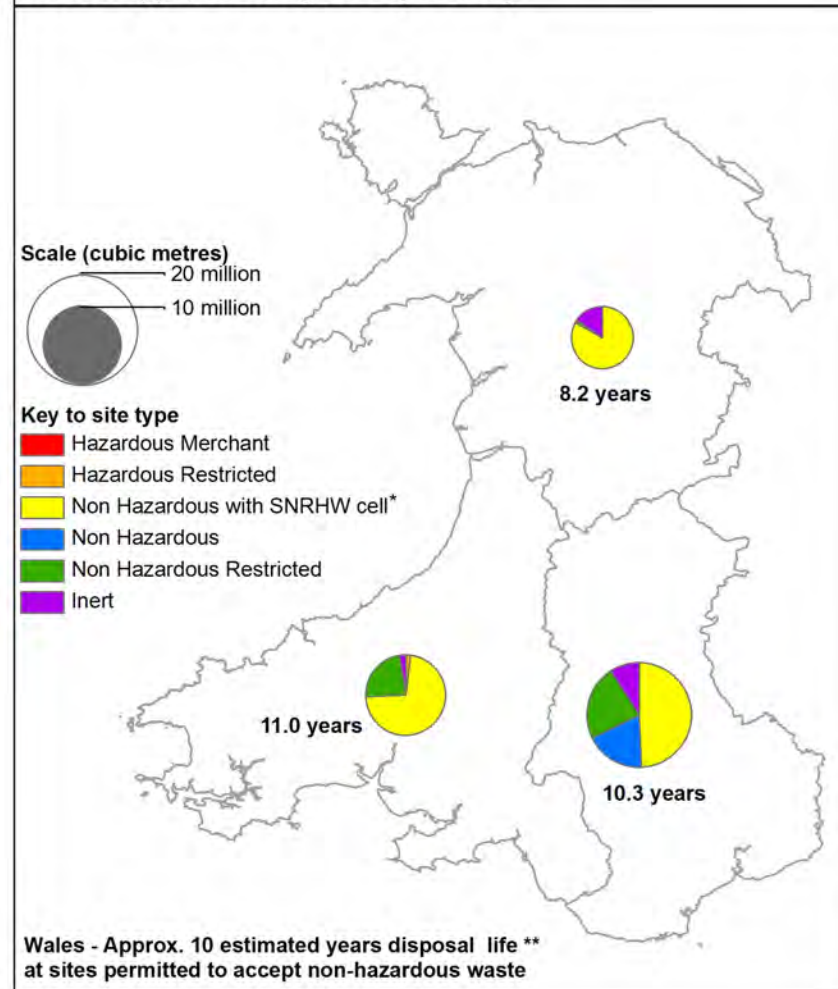
- 8 per cent of capacity was at inert sites
- 72 per cent of capacity was at non-hazardous sites
- 20 per cent of capacity was at restricted user sites (non hazardous and hazardous).

Wales Waste Information 2011

<http://www.environment-agency.gov.uk/research/library/data/142825.aspx>

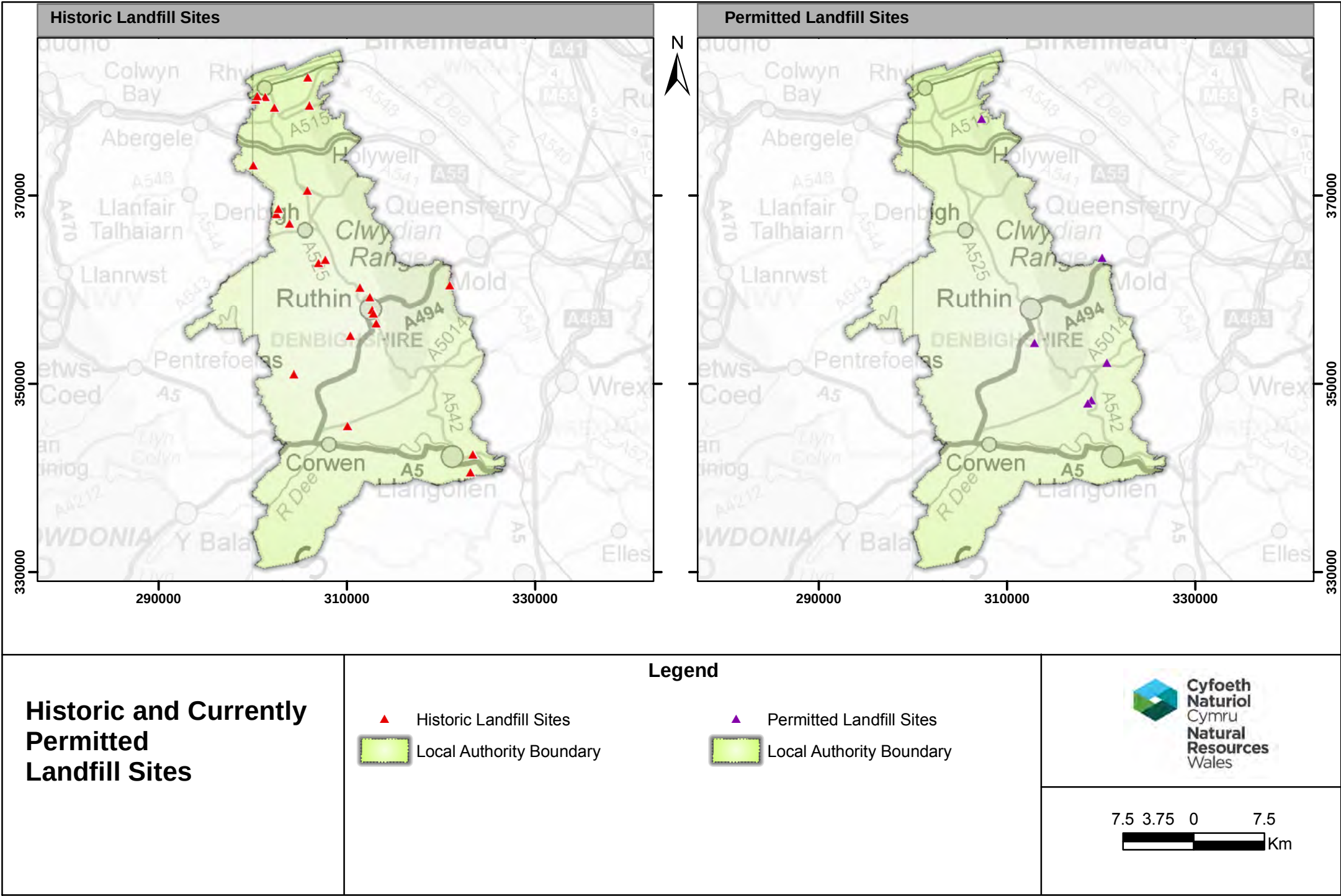
Wales: remaining landfill capacity by region and site type, showing life expectancy

2011 data



* Stable Non Reactive Hazardous Waste

** Estimate is indication only based on dividing regional capacity (void) at non-hazardous landfill sites by site inputs for 2011; for estimation purposes waste density is assumed to be 1.2 tonnes per m³, engineering and cover are assumed to consume an average of 25% total void space



Waste Management: Historic and Permitted Landfills

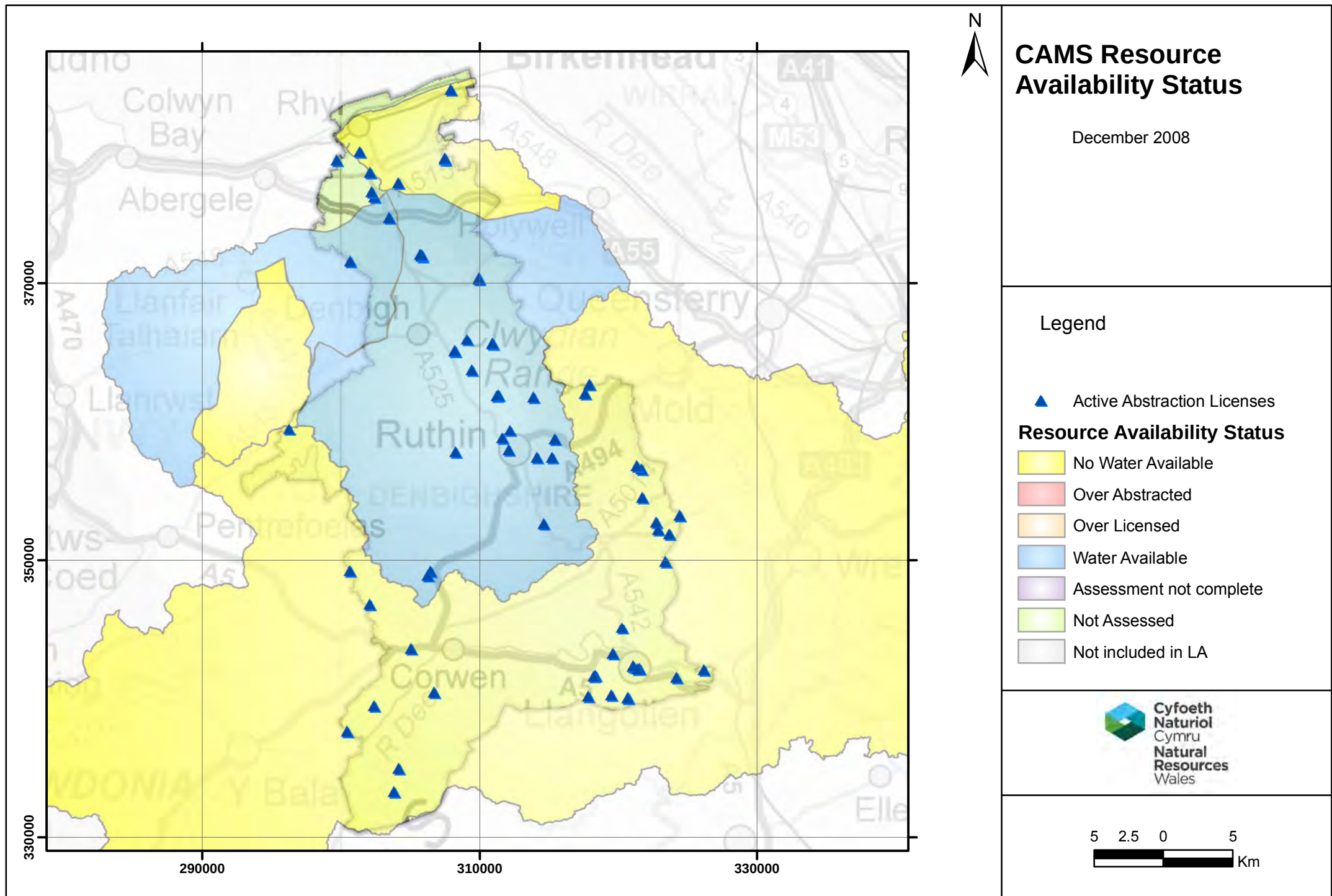
Historic Landfill sites

This map shows the location of historic landfills known to Natural Resources Wales. Historic landfill sites are locations where there are records of waste being received to be buried but the site is now closed or covered. These landfills do not have a current permit.

The information held has been collated from data held by Local Authorities, the former Department of the Environment, British Geological Survey and Environment Agency suspended authorised landfill licences. When landfills regulated by Natural Resources Wales are no longer permitted, they are added to the historic landfill database.

Permitted Landfill Sites

This map shows the location of all operational landfills. Operational landfills are sites with a current permit that are still accepting waste, or are no longer accepting waste but still being actively managed.



Water Resources

Natural Resources Wales is responsible for managing water resources in Wales. One of the ways that this is done is through licensing water abstraction. We developed Catchment Abstraction Management Strategies (CAMS):

- to inform the public on water resources and licensing practice
- to provide a consistent approach to local water resources management
- to help to balance the needs of water users and the environment

CAMS are 6 year plans detailing how water resources in an area will be managed.

CAMS relevant to Denbighshire are:
Clwyd, Dee

Catchment Abstraction Management Strategies (CAMS) have been produced 'to provide a framework for resource availability assessment and produce a licensing strategy which aids the sustainable management of water resources on a catchment scale.'

The current CAMS documents for Wales can be found here:

Catchment Abstraction Management Plans - Wales <http://www.environment-agency.gov.uk/business/topics/water/119933.aspx>

A new approach to CAMS has been developed to align with the Water Framework Directive (WFD) process. The implementation of the WFD requires further assessments of the water environment that were previously not part of CAMS. Also, the role of CAMS in licensing abstraction and managing time-limiting licences needs to be strengthened. By moving CAMS away from a cyclic review and into the day to day business, in particular its role in managing time-limited licences, we have made the process more flexible. This is important in the light of uncertainties such as climate change.

In June 2010 we published *Managing Water Abstraction* which sets out the national approach and regulatory framework within which we will manage water resources. <http://www.environment-agency.gov.uk/business/topics/water/119927.aspx>

Catchment Abstraction Management Strategies (CAMS)

Catchment Abstraction Management Strategies (CAMS): resource availability status

For all CAMS Areas classified as **'water available'**. (blue)

- Additional water is likely to be available for abstraction even at low flows.
- Larger volumes of water may be available at higher flows or for non-consumptive purposes.
- All new licences will be subject to restrictions that protect the environment and existing water users.
- All licence applications will be assessed on a case by case basis
- Existing Abstraction Licences – There will be no impact on existing abstractors unless their abstraction is causing an adverse impact on a designated site. Action may be needed under the Habitats Directive Review of Consents.

For all CAMS Areas classified as **'no water available'**. (yellow)

- No additional water is available for abstraction at low flows.
- Water may be available at high flows or for non-consumptive purposes.
- All new licences will be subject to restrictions that protect the environment and existing water users.
- All licence applications will be assessed on a case by case basis
- Existing Abstraction Licences – There will be no impact on existing abstractors unless their abstraction is causing an adverse impact on a designated site. Action may be needed under the Habitats Directive Review of Consents.

For all CAMS Areas classified as **'over licensed'**. (orange)

- Most abstractors do not abstract their full licence quantity. If existing licences used their full allocation, they would have the potential to cause unacceptable environmental impact at low flows.
- New licences will only be granted if water is available at higher flows.
- All licence applications will be assessed on a case by case basis.
- Existing Abstraction licences - there will be no impact on existing abstractors unless their abstraction is causing an adverse impact on a designated site. Action may be needed under the Habitats Directive Review of Consents

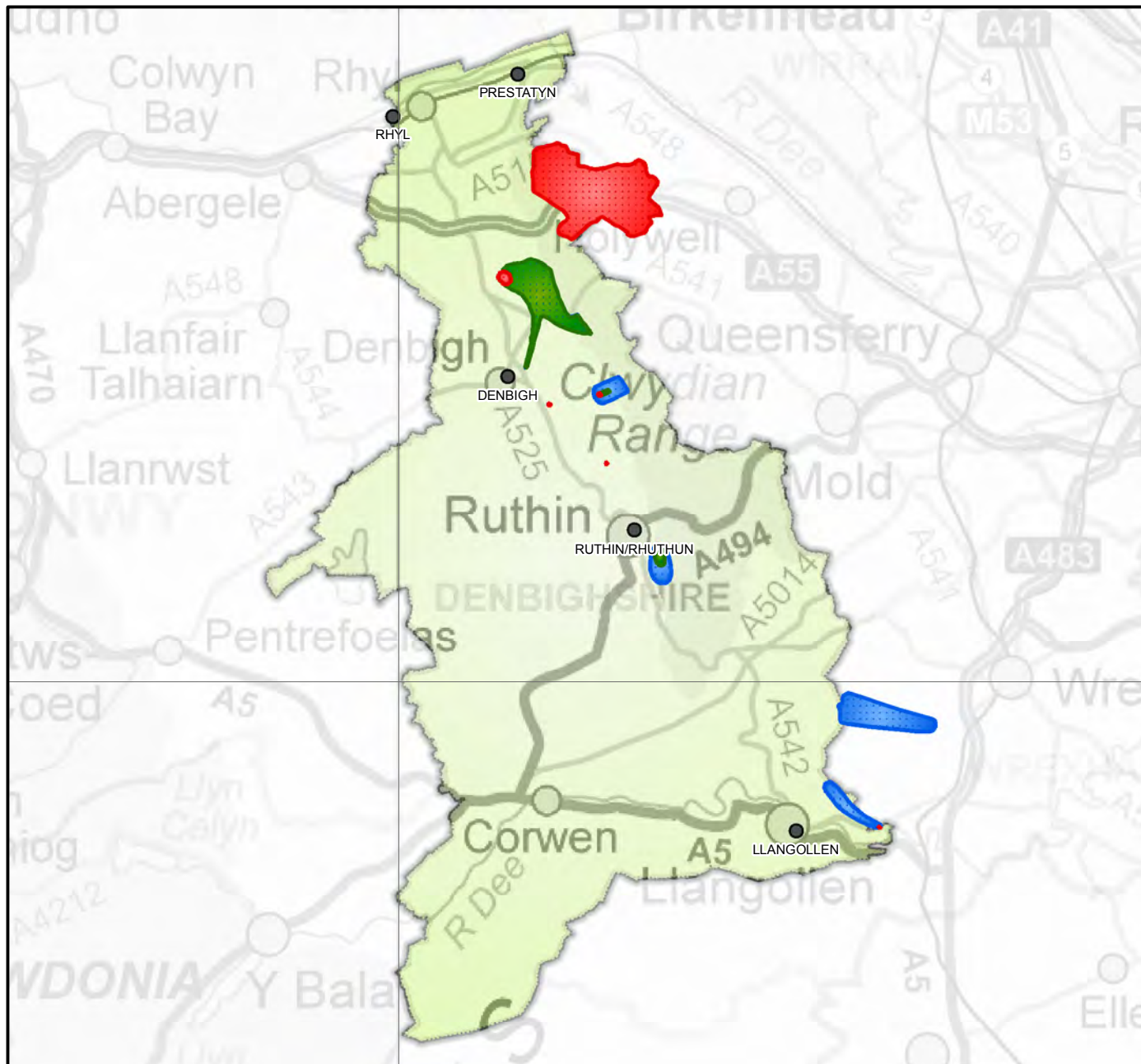
For all CAMS Areas classified as **'over abstracted'**. (Red)

- Existing licences already have the potential to cause unacceptable environmental impact at low flows.
- In some cases new licences will be granted if water is available at higher flows.
- All licence applications will be assessed on a case by case basis.
- Existing Abstraction licences - there will be no impact on existing abstractors unless their abstraction is causing an adverse impact on a designated site. Action may be needed under the Habitats Directive Review of Consents

Not yet assessed (purple) – these areas have not yet been assessed under the CAMS process. This work is on going.

Not assessed (green)

- Not all watercourses are assessed under the CAMS process. Those very small coastal watercourses where abstraction is limited are not included within the classification.
- All licences applied for in these locations will be subject to the same licensing processes as all other applications.
- All licence applications will be assessed on a case by case basis.

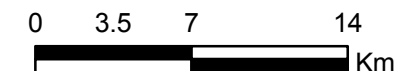


Groundwater Source Protection Zones (SPZ)

Legend

Source Protection Zones

- Zone 1 - Inner Protection Zone
- Zone 2 - Outer Protection Zone
- Zone 3 - Total Catchment
- Zone of Special Interest
- Local Authority



Groundwater Source Protection Zones (SPZ) in Denbighshire

Groundwater

Groundwater supplies about one third of drinking water in England and around 3 per cent in Wales. Groundwater also helps to maintain the flow in many of our rivers and wetland ecosystems.

Pollution and increasing demand for water are putting groundwater resources under pressure.

Definitions

Groundwater water that is below the surface of the ground in the saturation zone (below the water table) and in direct contact with the ground or subsoil

Aquifer a subsurface layer or layers of rock or other geological strata of sufficient porosity and permeability to allow either a significant flow of groundwater or the abstraction of significant quantities of groundwater

Recharge water which percolates downward from the surface into groundwater

Links to Further information:

A comprehensive guide on groundwater protection is available on the Environment Agency website: "Groundwater Protection: Principles and Practice" (GP3)

<http://www.environment-agency.gov.uk/research/library/publications/144346.aspx>

This policy sets out how we manage and protect groundwater resources, and our plans for the future.

Source Protection Zones (SPZs)

We have defined Source Protection Zones (SPZs) for groundwater sources such as wells, boreholes and springs used for public drinking water supply. These zones show the risk of contamination from any activities that might cause pollution in the area. The closer the activity, the greater the risk. The maps show three main zones (inner, outer and total catchment) and a fourth zone of special interest, which we occasionally apply, to a groundwater source.

Zone 1 (Inner protection zone)

Defined as the 50 day travel time from any point below the water table to the source. This zone has a minimum radius of 50 metres.

Zone 2 (Outer protection zone)

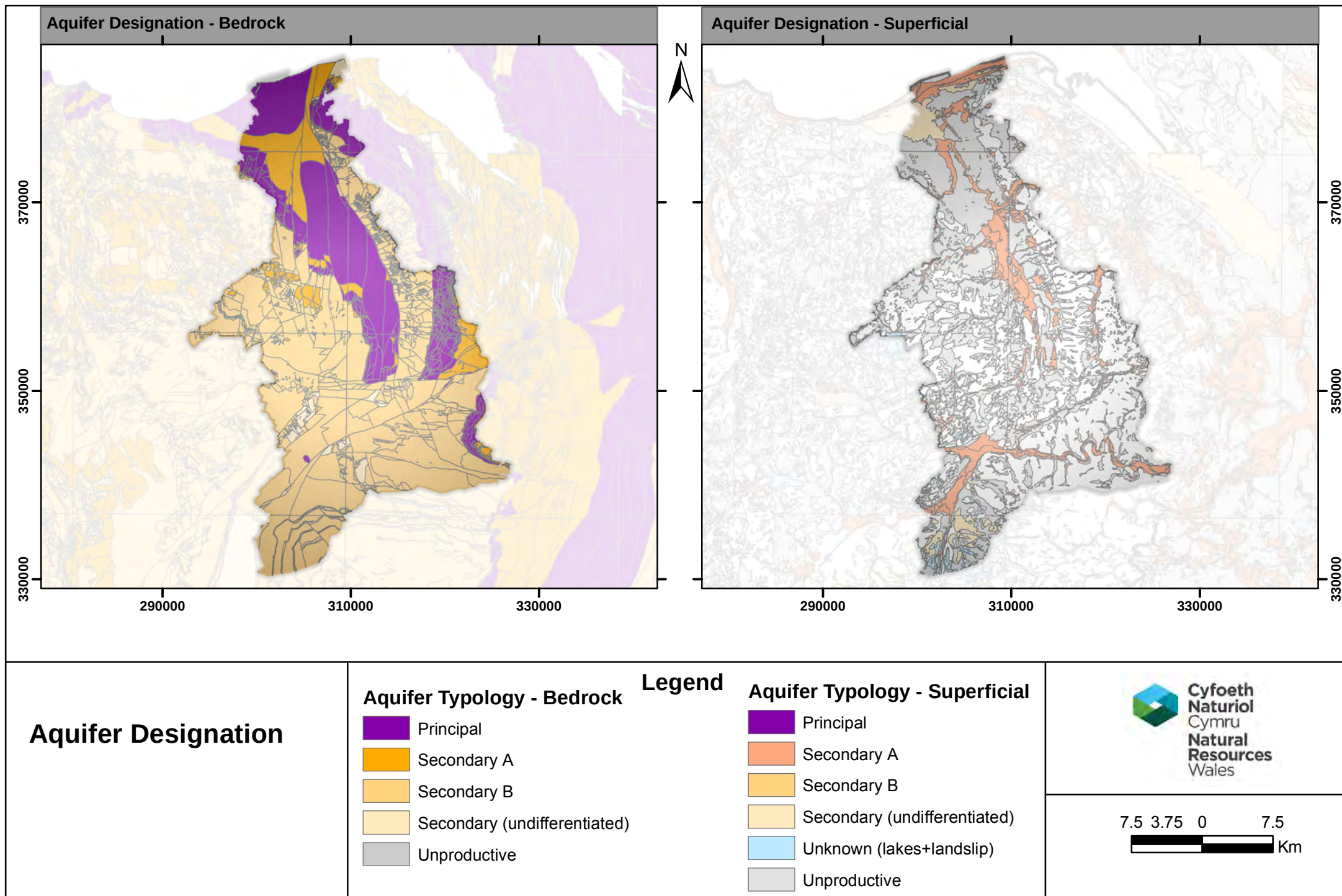
Defined by the 400-day travel time from a point below the water table. Additionally this zone has a minimum radius of 250 or 500 metres, depending on the size of the abstraction.

Zone 3 (Total catchment)

This zone is defined as the total area needed to support the abstraction or discharge from the protected groundwater source.

Zone of special interest

A fourth zone SPZ4 or 'Zone of Special Interest' was previously defined for some groundwater sources. These zones highlighted areas (mainly on non-aquifers) where known local conditions meant that potentially polluting activities could impact on a groundwater source even though the area is outside the normal catchment of that source. In future this zone will be incorporated into one of the other zones (1, 2 or 3), whichever is appropriate in the particular case.



Aquifer Designation Maps

We help to protect groundwater by identifying different types of aquifer - underground layers of water-bearing permeable rock or drift deposits from which groundwater can be extracted.

Our Groundwater Protection Policy now uses aquifer designations that are consistent with the Water Framework Directive. These designations reflect the importance of aquifers in terms of groundwater as a resource (drinking water supply) but also their role in supporting surface water flows and wetland ecosystems.

The aquifer designation data is based on geological mapping provided by the British Geological Survey. It will be updated regularly to reflect their ongoing programme of improvements to these maps. We gratefully acknowledge this assistance.

The maps show two different types of aquifer designation:

Bedrock – solid permeable formations e.g. sandstone, chalk and limestone

Superficial – permeable unconsolidated (loose) deposits e.g. sands and gravels

Note: Some map tiles on the Aquifer Designation – Superficial maps may appear to be missing. These areas were not surveyed because they do not contain significant aquifers and the whole area has been classified as unproductive.

The aquifer designation maps shown on the previous page display the following designations:

Principal Aquifers

These are layers of rock or drift deposits that have high intergranular and/or fracture permeability- meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale. In most cases, principal aquifers are aquifers previously designated as major aquifer.

Secondary Aquifers

These include a wide range of rock layers or drift deposits with an equally wide range of water permeability and storage. Secondary aquifers are subdivided into two types:

Secondary A - permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers

Secondary B - predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers.

Secondary Undifferentiated - has been assigned in cases where it has not been possible to attribute either category A or B to a rock type. In most cases, this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type.

Unproductive Strata

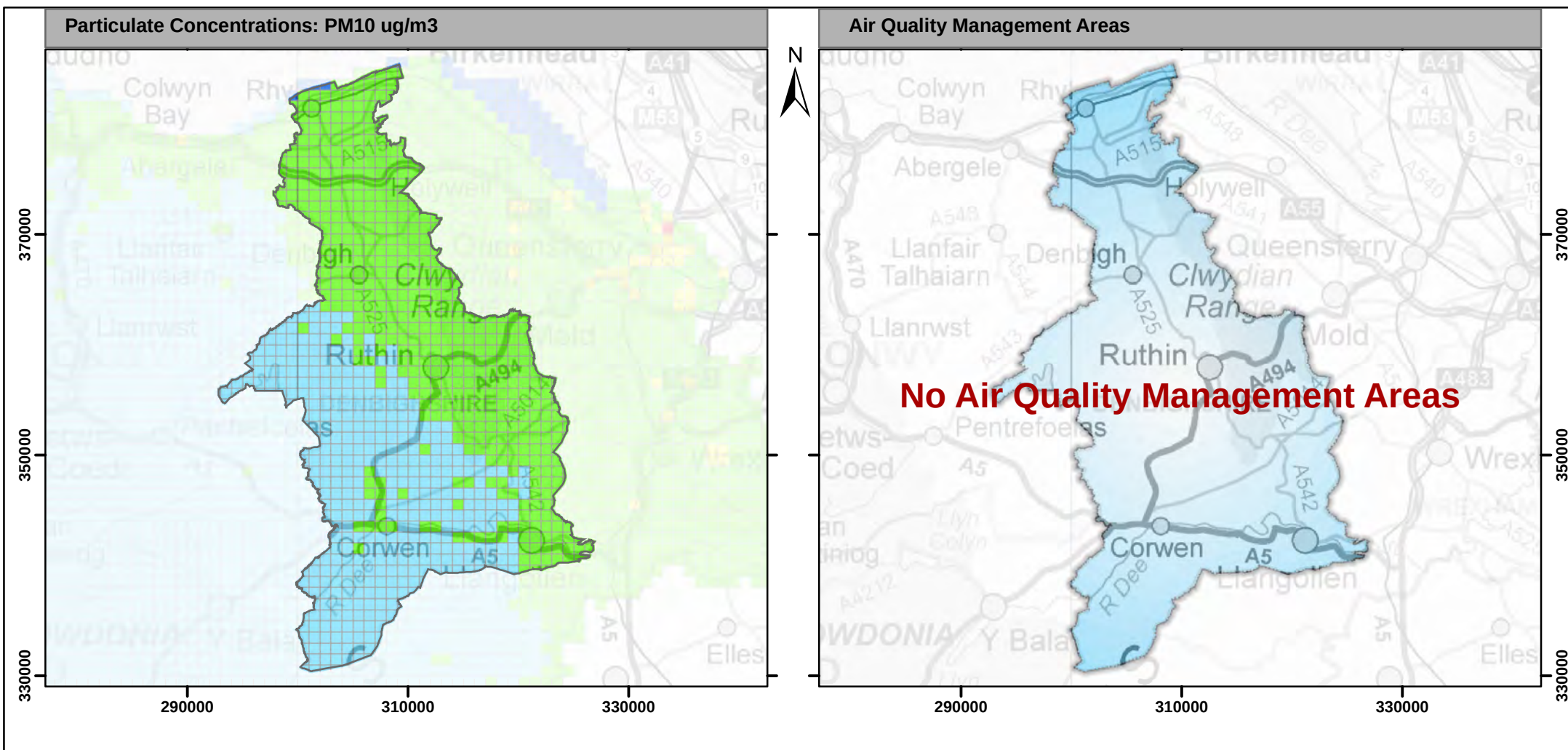
These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow.

Note: We are only able to display the principal and secondary aquifers as coloured areas on the maps. All uncoloured areas on the bedrock designation map will be unproductive strata. However, for uncoloured areas on the superficial (drift) designation map you will not be able to distinguish between areas of unproductive strata and areas where no drift is present. To do this you will need to consult the published geological survey maps

Links to further information

Environment Agency website - Aquifer designations

<http://www.environment-agency.gov.uk/homeandleisure/117020.aspx>



**Air Quality: Modelled
Annual Mean
Concentrations for PM10
(2010)**

and

**Air Quality Management
Area Locations**

**Air Quality
PM10**

≤5

5 - 10

10 - 15

15 - 20

20 - 30

Local Authority Boundary

Legend

Air Quality Management Areas

● Air Quality Management Area

Local Authority Boundary

Air Quality Management Areas
are as known at Jan 2013

**Cyfoeth
Naturiol
Cymru
Natural
Resources
Wales**

7.5 3.75 0 7.5
Km

Air Quality: Modelled concentrations for PM10 in Denbighshire

Particulate Matter (PM₁₀)

The PM₁₀ concentration map shows modelled annual mean concentrations for PM₁₀ mapped to a 1km grid. The data is produced by Ricardo-AEA for Defra and is based on modelled emissions to the atmosphere from UK sources from the National Atmospheric Emissions Inventory (NAEI) together with measured concentrations. The data is available from <http://uk-air.defra.gov.uk/> under the Open Government Licence <http://www.nationalarchives.gov.uk/doc/open-government-licence/version/2/>.

This map should only be used as an indication of the level of the substance in the local environment. This map is meant to be used at an aggregated scale towards the local authority level and errors may be found when looking at single 1km x 1km cells themselves. The aggregation of this data over a 10km radius is thought to be valid and the map does provide a indication of the spatial distribution of each substance. However, care should be taken to not 'over interpret' the data shown.

Particulate Matter is generally categorised on the basis of the size of the particles, PM₁₀ being particles with a diameter of less than 10µm. PM is made up of a wide range of materials and is produced by a variety of processes such as combustion (eg in vehicle engines), mechanical breakdown of hard materials (e.g. quarrying) and natural sources (e.g. sea salt). As well as primary particles emitted directly into the atmosphere there can be secondary particles formed by chemical reactions in the air.

Both short-term and long-term exposure to ambient levels of PM are consistently associated with respiratory and cardiovascular illness and mortality as well as other ill-health effects.

The current UK National Air Quality Strategy objectives and Air Quality Standards (Wales) 2010 Regulations limit values for PM₁₀ are a concentration of less than 40 µg m⁻³ measured as an annual mean and 50 µg m⁻³ measured as a 24 hour mean (not to be exceeded more than 35 times per year). We have mapped the available data for the annual mean concentrations, but do not have access to modelled estimates of the daily averages.

Links to further information:

Air Quality on the GOV.UK website

<https://www.gov.uk/government/policies/protecting-and-enhancing-our-urban-and-natural-environment-to-improve-public-health-and-wellbeing>

Air Quality on the Welsh Government website

<http://wales.gov.uk/topics/environmentcountryside/epg/airqualitypollution/airquality/>

UK-AIR: Defra's air information resource

<http://uk-air.defra.gov.uk/>

Air Quality: Air Quality Management Areas (AQMA)

Air Quality Management Areas (AQMA)

Local Authorities are required to ensure that local air quality meets national standards. If not, they must take action to improve air quality.

Since December 1997, local authorities have been carrying out a review and assessment of air quality in their area. This involves measuring air pollution and trying to predict how it will change in the next few years. The aim of the review is to make sure that the national air quality objectives will be achieved throughout the UK by the relevant deadlines. These objectives have been put in place to protect people's health and the environment.

If a local authority finds any places where the objectives are not likely to be achieved, it must declare an Air Quality Management Area there. This area could be just one or two streets, or it could be much bigger. Then the local authority will put together a plan to improve the air quality - a Local Air Quality Action Plan.

AQMAs have been declared in Wales for PM₁₀ and NO₂.

Some links to further information:

Welsh Government – Air Quality

<http://new.wales.gov.uk/topics/environmentcountryside/epg/airqualitypollution/>

StatsWales – State of the Environment indicator: number of people living in Air Quality Management Areas

<http://statswales.wales.gov.uk/>

(StatsWales Home>Environment and Countryside> State of the Environment> Environmental Hazards)

Defra – Air Quality Management Areas

<http://aqma.defra.gov.uk/>

Nitrogen Oxides (NO and NO₂)

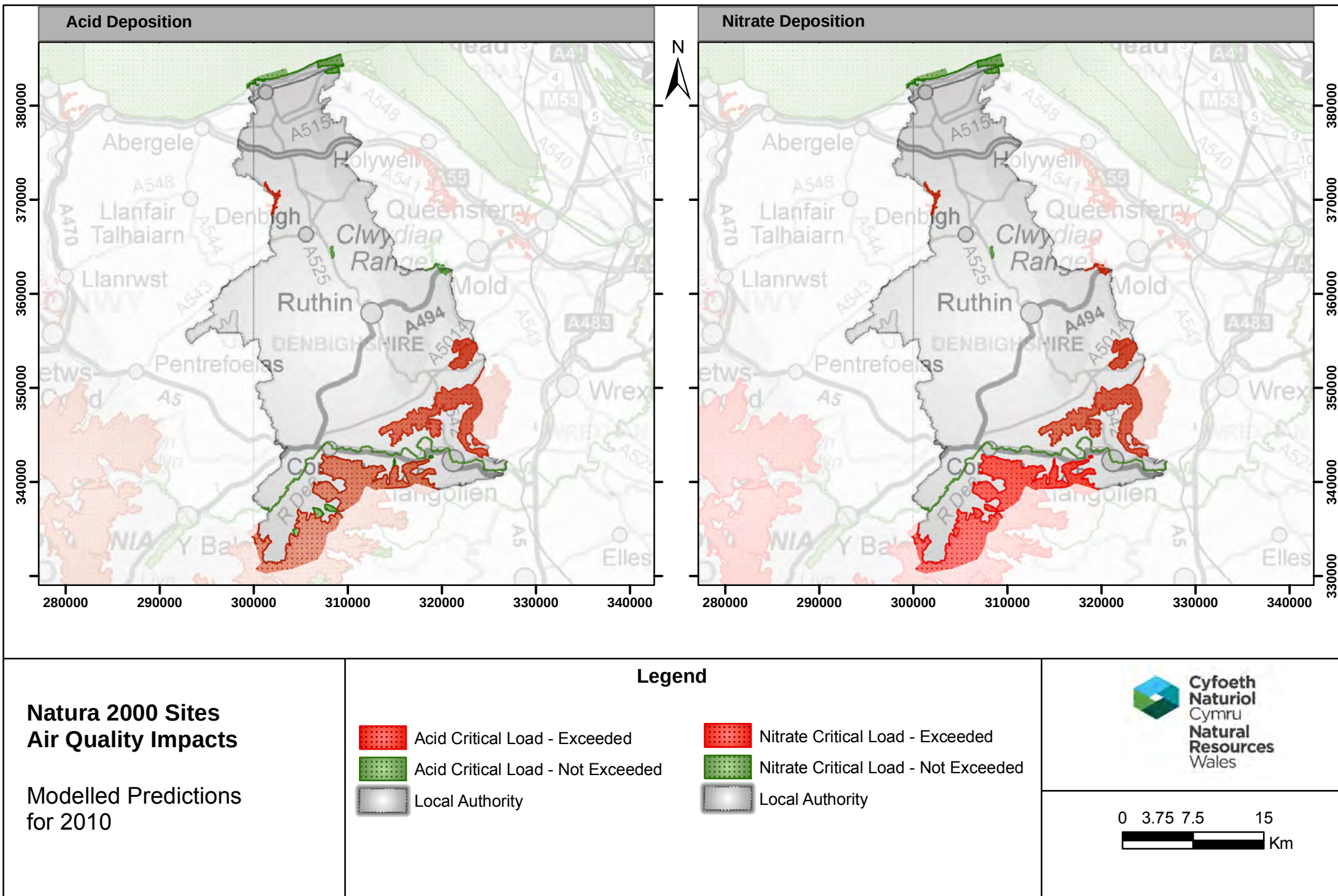
Nitric oxide (NO) is mainly derived from road transport emissions and other combustion processes such as the electricity supply industry. NO is not considered to be harmful to health. However, once released to the atmosphere, NO is usually very rapidly oxidised to nitrogen dioxide (NO₂), which is harmful to health. NO₂ and NO are both oxides of nitrogen and together are referred to as nitrogen oxides (NO_x).

Nitrogen dioxide can irritate the lungs and lower resistance to respiratory infections such as influenza. Continued or frequent exposure to concentrations that are typically much higher than those normally found in the ambient air may cause increased incidence of acute respiratory illness in children.

High levels of NO_x can have an adverse effect on vegetation, including leaf or needle damage and reduced growth. Deposition of pollutants derived from NO_x emissions contribute to acidification and/or eutrophication of sensitive habitats leading to loss of biodiversity, often at locations far removed from the original emissions. NO_x also contributes to the formation of secondary particles and ground level ozone, both of which are associated with ill-health effects. Ozone also damages vegetation.

The current UK National Air Quality Strategy objectives for nitrogen dioxide are a concentration of 200 µg m⁻³ measured as a 1 hour mean not to be exceeded more than 18 times a year and an annual mean of 40 µg m⁻³ not to be exceeded.

The table on the following page shows Air Quality Management Areas in the planning authority area (as at January 2013).



Air Quality: Deposition and Impacts in Denbighshire

Critical Loads - Acid Deposition and Nitrate Deposition

Acid deposition includes both wet and dry deposition of pollutants from the atmosphere that have the potential to acidify soils and freshwaters. The pollutants include sulphur dioxide (SO₂), nitrogen oxides (NO_x) and ammonia (NH₃).

Nitrogen deposition is the deposition of mainly nitrogen oxides (NO_x) and ammonia (NH₃) from the atmosphere to land. Total deposition is the combination of both wet and dry deposition. Nitrogen deposition refers to the pollutant dose that may lead to eutrophication.

In order to decipher whether acid or nitrogen deposition is having a negative effect on an ecosystem, or an aspect of an ecosystem, critical loads are set for individual habitats, for example a woodland or a bog, and species, for example a moss or a freshwater plant. Critical load relates to the quantity of a pollutant deposited from air to ground. Where deposition is less than a critical load it can be concluded that deposition is not having a negative effect on specified sensitive elements of the environment. The critical load is the threshold level for the deposition of a pollutant above which harmful indirect effects can be shown on a habitat or species. If deposition is greater than the critical load then it is deemed as an exceedance of critical load.

The effects of acid deposition vary according to habitat or species. In general where acid deposition is high there is a decrease in overall biodiversity. Woodland habitats see a decline in general tree health and trees can become more susceptible to stresses such as drought and frost. Mosses, lichens and bryophytes are most at risk of damage from acidification and are often used as bio-indicators in order to establish whether acid deposition is having a negative effect. Acidification of freshwaters leads to a reduction in biodiversity - as pH falls the number of species of invertebrates and fish falls. Loss of invertebrates and fish leads to a reduction in available food supply affecting fauna further up the food chain.

Nitrogen deposition can lead to the eutrophication of an ecosystem where plant species that are more tolerant of higher nitrogen levels dominate, reducing plant diversity, both on terrestrial sites and in the freshwater environment. A reduction in plant diversity will have knock on effects where fauna diversity will also decrease.

The main sources of **sulphur deposition** in the UK are large point sources such as power stations and refineries. Deposition from large, national and international sources is known as long range deposition. However there are local sources of sulphur, such as local point sources and transport.

The largest source of **nitrogen deposition** in the UK is from livestock emissions. Other large sources are emissions from transport - sites that are in close proximity to major roads can be subject to high levels of NO_x.

Critical Loads are modelled using the National Critical Loads database. We talk about status as at 2010 because this is the date set in the Habitats directive for the end of Habitats review of consents.

Natura 2000 is the European Union-wide network of protected areas, recognised as 'sites of Community importance' under the EC Habitats Directive (Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora). The Natura 2000 network includes two types of designated areas: Special Areas of Conservation (SAC) and Special Protection Areas (SPA). SACs are designated under the EC Habitats Directive and SPAs are classified under the EC Wild Birds Directive (Council Directive 79/409/EEC on the conservation of wild birds).

Some links to further information:

APIS provides a comprehensive source of information on air pollution and the effects on habitats and species. APIS has been developed in partnership by the UK conservation agencies and regulatory agencies and the Centre for Ecology and Hydrology

<http://www.apis.ac.uk>

<http://www.apis.ac.uk/starters-guide-air-pollution>

Critical Loads & Dynamic Modelling <http://cldm.defra.gov.uk/>

Defra information about Natura 2000 sites

<https://www.gov.uk/protected-or-designated-areas#european-sites>

Joint Nature Conservation Committee information about protected sites, Special Areas of Conservation (SAC) and Special Protection Areas (SPA)

<http://www.jncc.gov.uk/page-4>

Welsh Index of Multiple Deprivation: Air Quality

The Welsh Index of Multiple Deprivation

The Welsh Index of Multiple Deprivation 2011 (WIMD) is the official measure of deprivation at the small area level in Wales. WIMD was developed for the Welsh Government by the Welsh Government Statistical Directorate and the Local Government Data Unit (Wales).

More information can be found in the Welsh Government's Welsh Index of Multiple Deprivation 2011: Summary Report

<http://new.wales.gov.uk/topics/statistics/theme/wimd/wimd2011/>

There are eight domains, or kinds, of deprivation included in the overall index of deprivation: Income; Employment; Education; Health; Access to services; Housing; Physical environment and Community safety.

Natural Resources Wales provides the data for the physical environment domain.

The physical environment domain of the WIMD index incorporates four indicators: air quality (concentrations of air pollutants), emissions of air pollutants, flood risk and proximity to regulated sites i.e. waste disposal and industrial sites.

Air Quality

Air quality is believed to be a good proxy measure of the quality of the surrounding environment. Poor air quality suggests proximity to certain activities such as traffic, domestic combustion and industrial sites – activities that could have a negative impact on quality of life, the local environment and health.

The Air Quality indicator uses data on concentrations of pollutants (benzene, nitrogen dioxide, sulphur dioxide, particulates, carbon monoxide and ozone) and Air Quality Management Area data. More information on how the index was produced can be found in Welsh Index of Multiple Deprivation 2008: Technical Report and the Welsh Index of Multiple Deprivation 2011: Summary of Methodological Changes.

<http://wales.gov.uk/docs/statistics/2009/090319wimdtechreport09en.pdf>

<http://wales.gov.uk/topics/statistics/publications/wimd11method/>

Air Emissions

Air quality is the preferred measure of risks from air pollution but air emissions data provides a good set of complementary data covering pollutants that are not included in the Air Quality indicator. Emissions data are good indicators of proximity to polluting activities. More information on how the index was produced can be found in Welsh Index of Multiple Deprivation 2008: Technical Report.

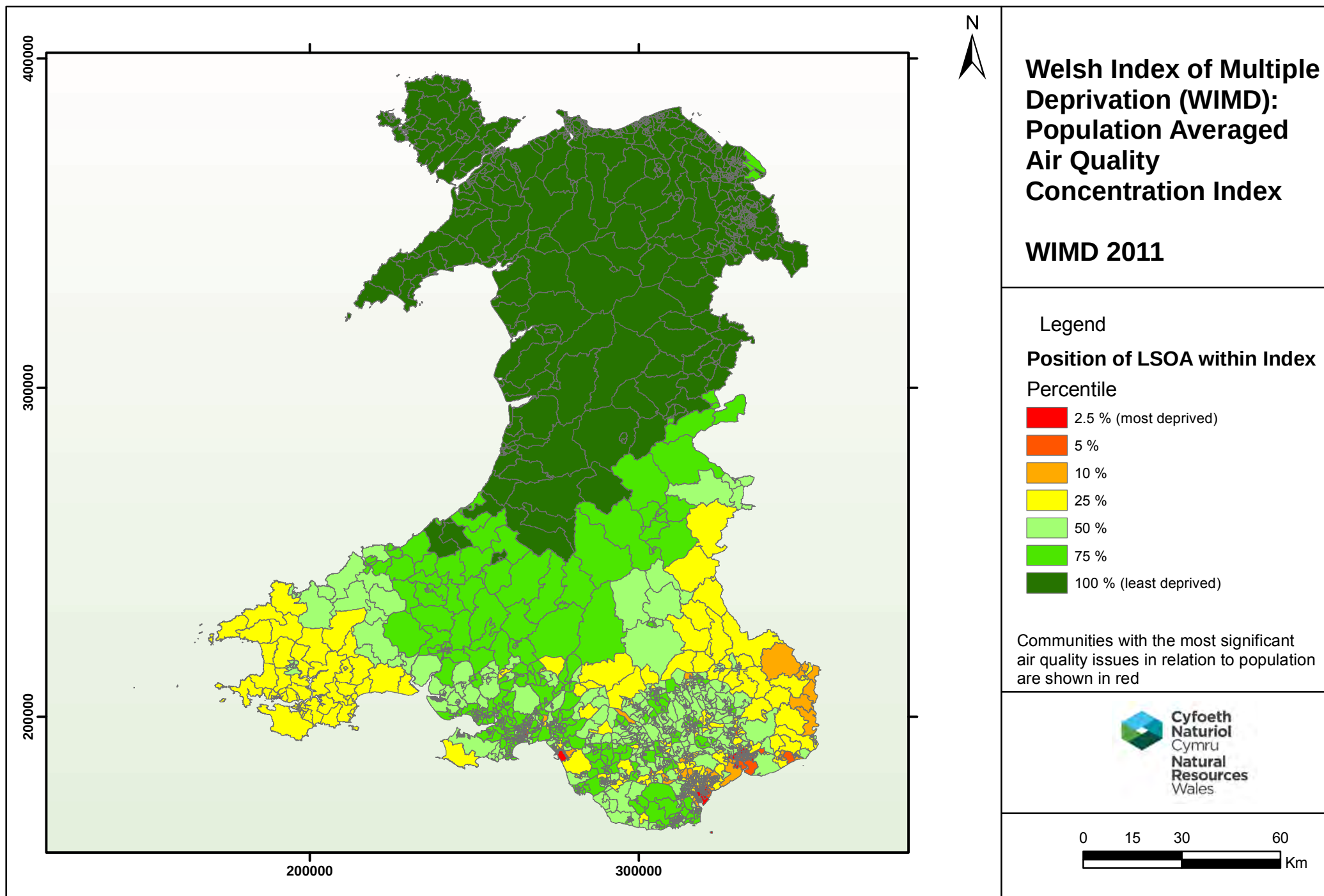
<http://wales.gov.uk/docs/statistics/2009/090319wimdtechreport09en.pdf>

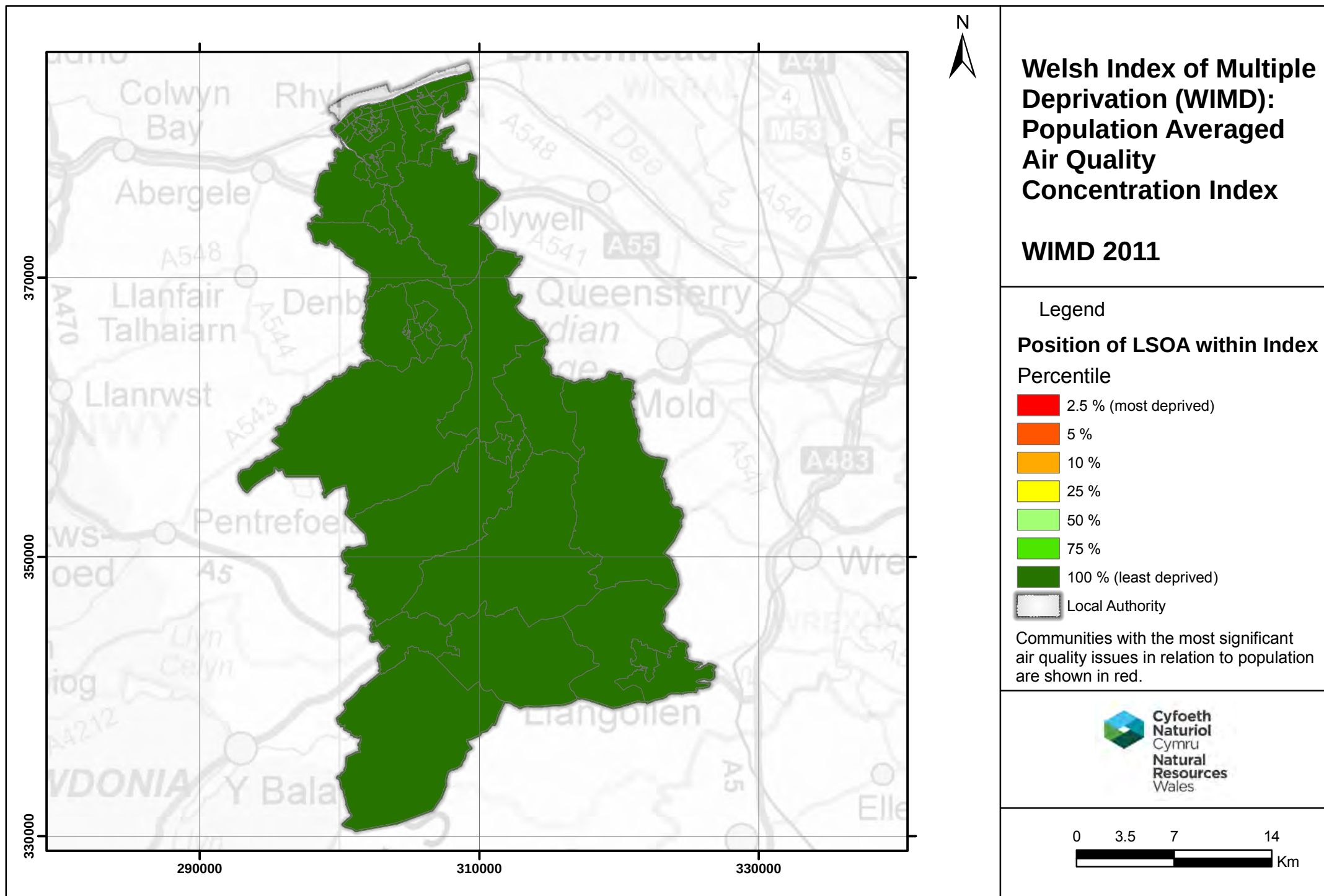
The four maps in the following pages show:

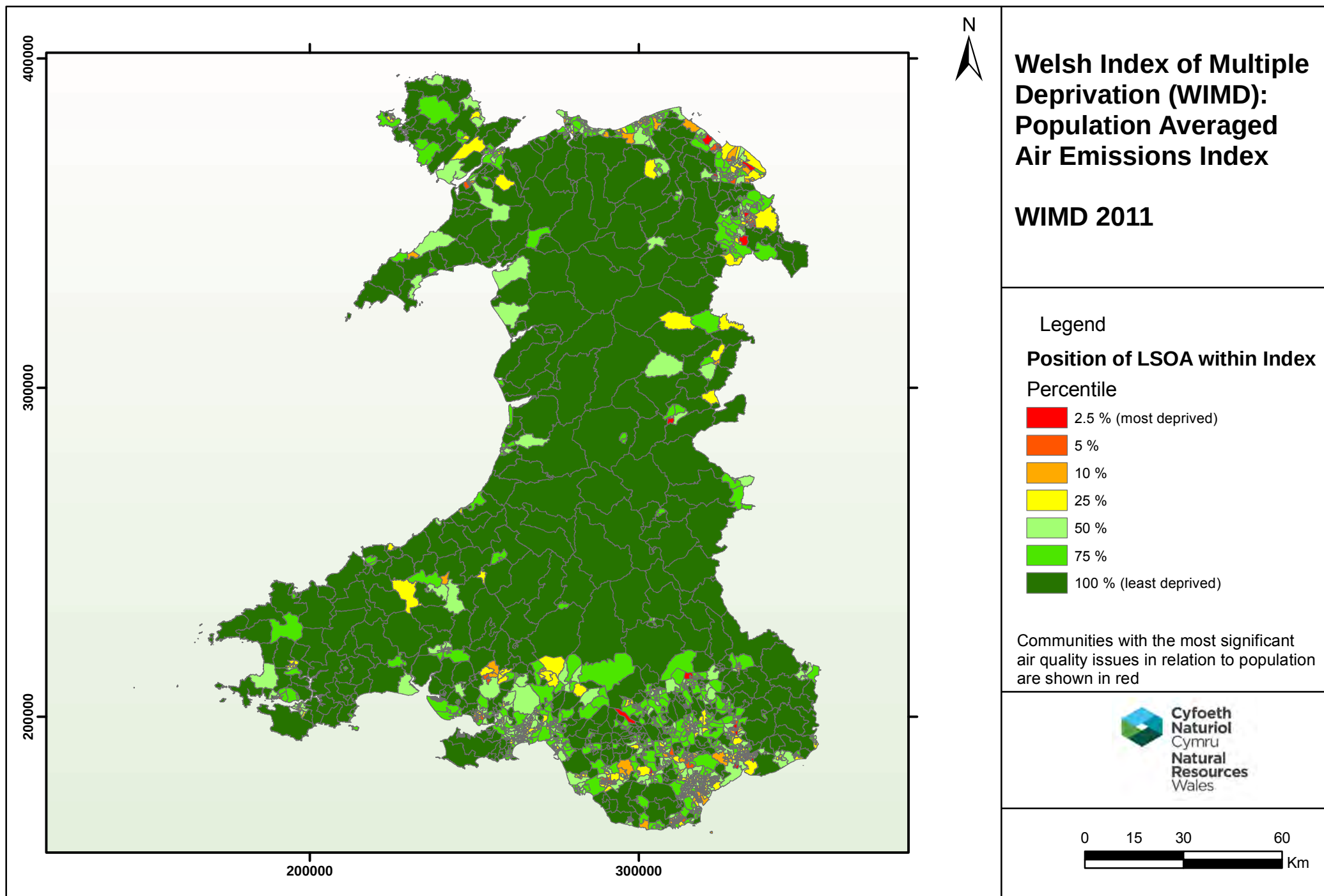
- Lower Layer Super Output Areas (LSOA) in Wales and the position of the LSOA within the index for Air Quality
- Lower Layer Super Output Areas (LSOA) in the Local Authority and the position of the LSOA within the index for Air Quality
- Lower Layer Super Output Areas (LSOA) in Wales and the position of the LSOA within the index for Air Emissions
- Lower Layer Super Output Areas (LSOA) in the Local Authority and the position of the LSOA within the index for Air Emissions

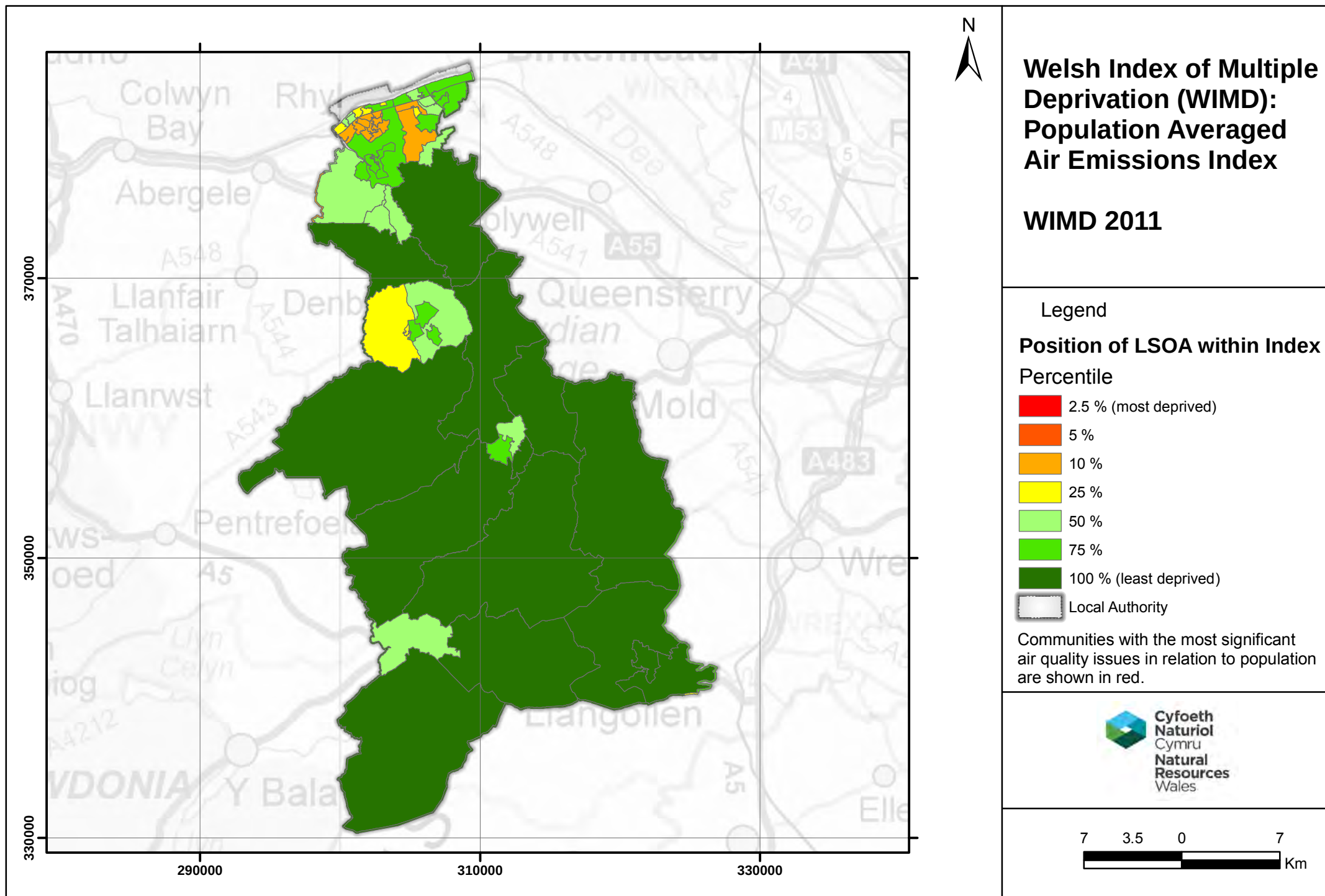
The areas shown in red have the most significant air quality issues.

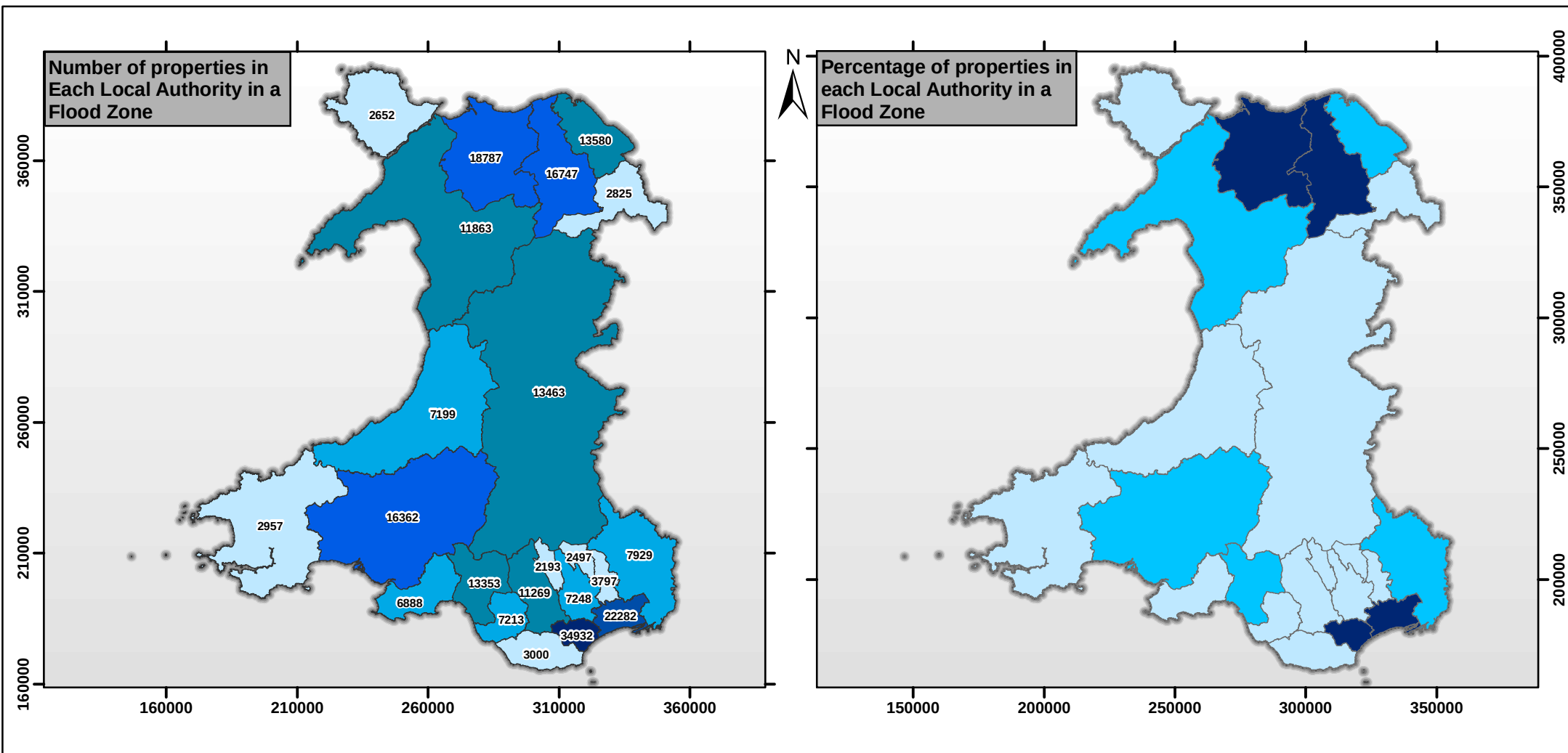
Note: For more information on LSOAs and what they are, see <http://www.neighbourhood.statistics.gov.uk> NeSS Geography







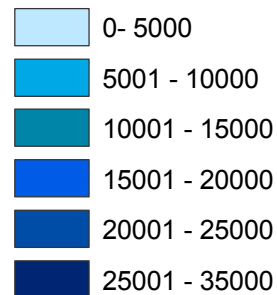




Number and Proportion of Properties in each Local Authority in Wales in a Flood Zone

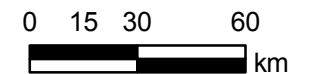
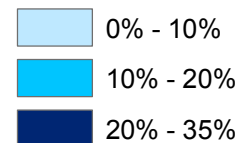
National Flood Risk Assessment (NaFRA) 2012 Data

No of properties in a Flood Zone



Legend

% Properties in Flood Zones in each LA



Flooding

The impact of flooding on Wales

Floods and coastal erosion are the greatest natural threats to the people, economy and environment of Wales.

Across Wales around 220,000 properties are currently at risk of flooding from rivers and the sea. Around half a million, out of a population of 3 million, live and work on the flood plains in Wales. The potential annual economic risk to residential and business properties and their contents was estimated at £200 million in April 2008. Commercial, industrial and key infrastructure, like power supplies, communication systems, transport links, emergency services and schools are situated on land at risk of flooding and estimated to be worth over £8 billion.

The maps above show the number of properties in each local authority and the proportion of properties in each local authority at risk of flooding.

Climate change is expected to increase river flooding, cause sea level rise and increase the flood and coastal erosion risk. The 2004 Foresight Future Flooding report suggested that the annual economic damages in Wales will rise from £70 million in 2004 to £1,235 million in the 2080s under the most likely scenario. However, as the Stern Report found, taking action now can reduce the longer term total economic damage.

Welsh Index of Multiple Deprivation: Flood Risk

The Welsh Index of Multiple Deprivation

The Welsh Index of Multiple Deprivation 2011 (WIMD) is the official measure of deprivation at the small area level in Wales. WIMD was developed for the Welsh Government by the Welsh Government Statistical Directorate and the Local Government Data Unit (Wales).

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There are eight domains, or kinds, of deprivation included in the overall index of deprivation: Income; Employment; Education; Health; Access to services; Housing; Physical environment and Community safety.

Natural Resources Wales is involved in the production of the physical environment domain index.

The physical environment domain of the WIMD index incorporates four indicators: air quality (concentrations of air pollutants), emissions of air pollutants, flood risk and proximity to regulated sites i.e. waste disposal and industrial sites.

Flood Risk

Those who suffer flooding have a significant lowering of quality of life that can last for a number of years. Homes in areas that suffer increased flood risk will often have significantly higher insurance premiums, potentially leading to higher financial hardship in these areas. It is likely that economically and socially deprived areas will take longer to recover from flood events.

Flood risk calculations and maps were based on the 2009 NAFRA database which includes flood risk, taking into account flood defences where these are known. Different levels of risk were taken into account, as is done with insurance companies, with 3 levels of risk; significant, moderate and low risk. The risk is based on frequency rather than level of damage caused by any flooding.

More information on how the index was produced can be found in Welsh Index of Multiple Deprivation 2008: Technical Report and the Welsh Index of Multiple Deprivation 2011: Summary of Methodological Changes.

<http://wales.gov.uk/docs/statistics/2009/090319wimdtechreport09en.pdf>

<http://wales.gov.uk/topics/statistics/publications/wimd11method/>

More information on flood risk assessment and the NAFRA database can be found in Flooding in Wales – National Assessment of Flood Risk <http://www.environment-agency.gov.uk/research/library/publications/108958.aspx>

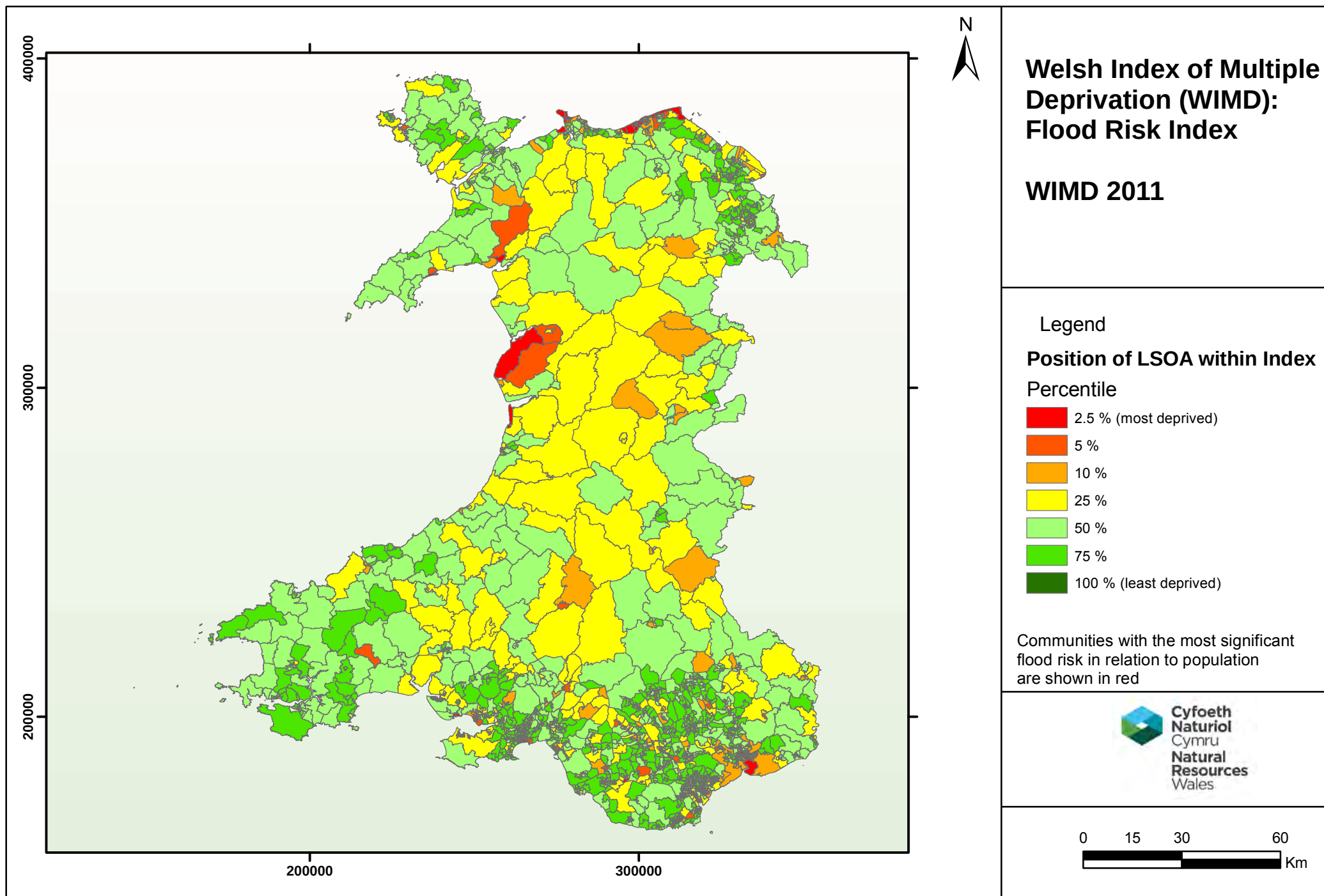
on the Environment Agency website.

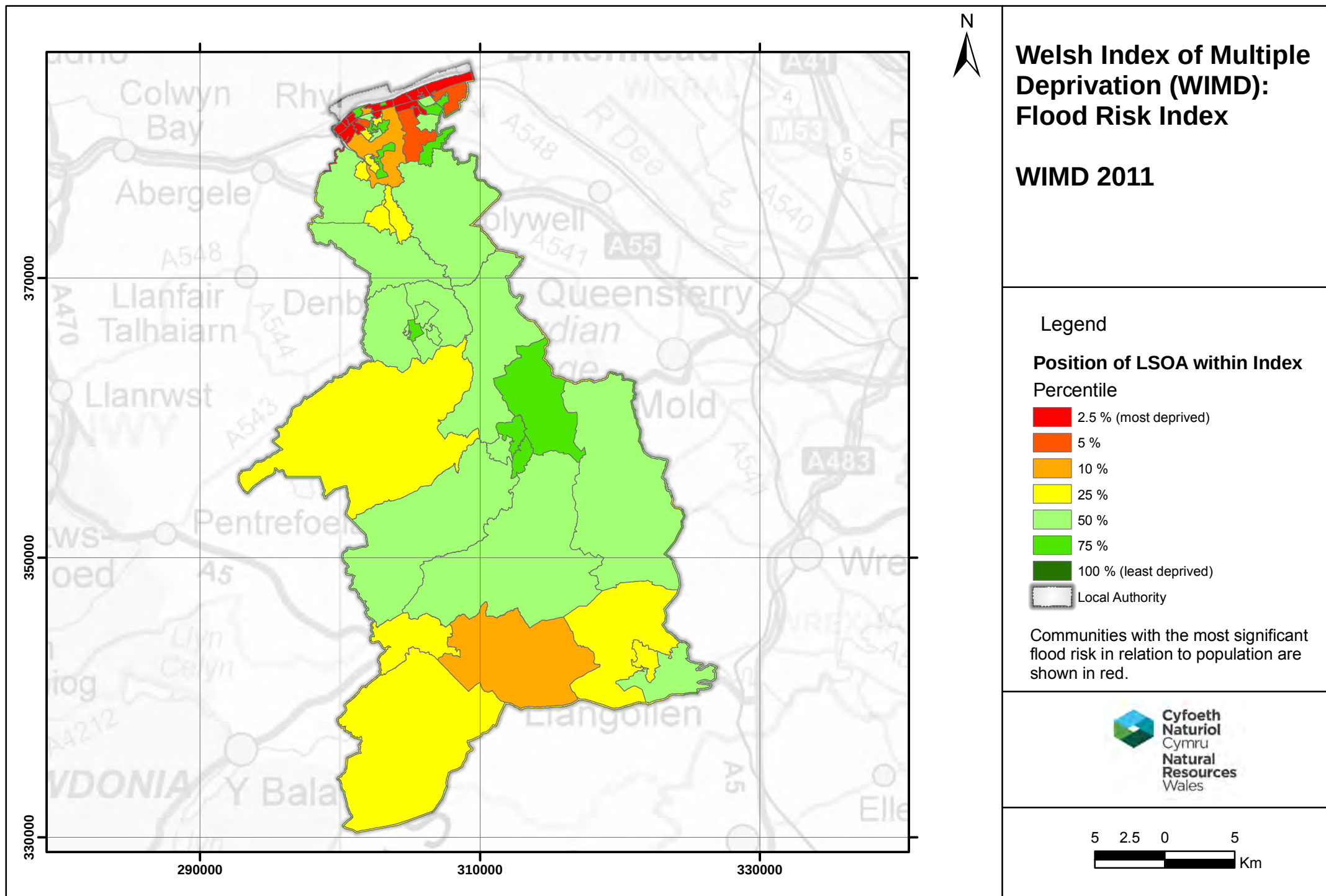
The two maps in the following pages show:

- Lower Layer Super Output Areas (LSOA) in Wales and the position of the LSOA within the index for Flood Risk
- Lower Layer Super Output Areas (LSOA) in the Local Authority and the position of the LSOA within the index for Flood Risk

The areas shown in red have the most significant flood risk in relation to population.

The WIMD: Flood Risk Index by LSOA table after the maps shows how each LSOA in the planning authority is ranked within Wales for flood risk. Low rank corresponds to relatively high flood risk.





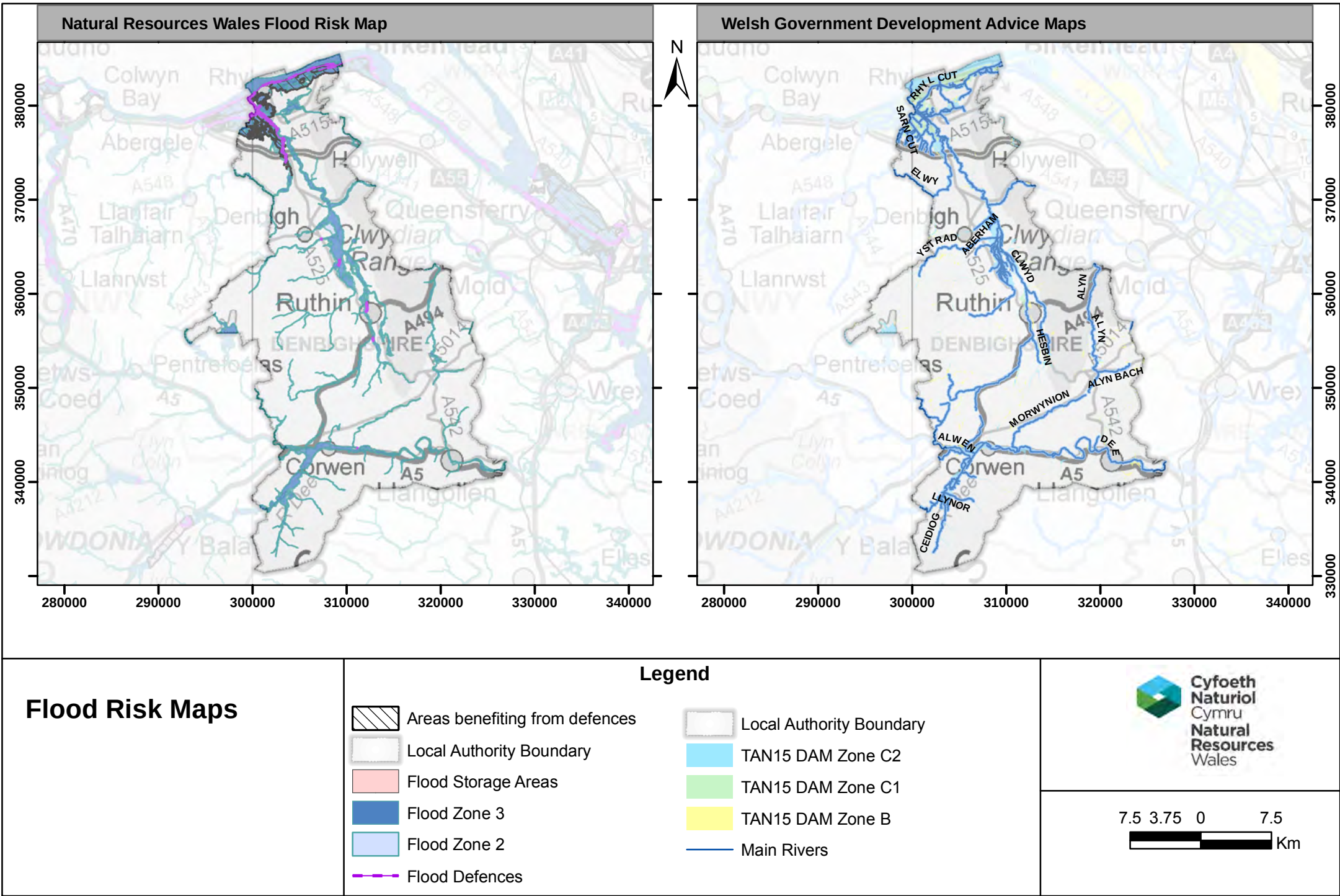
WIMD: Flood Risk Rank by Lower Super Output Area (LSOA)

This table shows how each LSOA in the planning authority is ranked within Wales for flood risk. Low rank corresponds to relatively high risk.

LSOA Code	LSOA Name	ONS LSOA Name	Flood Risk - National Rank	ONS = Office of National Statistics
W01000150	Kinmel Bay 2	Conwy 005B	1	
W01000237	Rhyl South West 2	Denbighshire 006B	3	
W01000152	Kinmel Bay 4	Conwy 005D	5	
W01000241	Rhyl West 3	Denbighshire 004F	9	
W01000219	Prestatyn North 2	Denbighshire 001B	12	
W01000239	Rhyl West 1	Denbighshire 004D	14	
W01000220	Prestatyn North 3	Denbighshire 001C	17	
W01000218	Prestatyn North 1	Denbighshire 001A	22	
W01000235	Rhyl South East 5	Denbighshire 005D	26	
W01000236	Rhyl South West 1	Denbighshire 006A	30	
W01000226	Rhyl East 1	Denbighshire 004A	35	
W01000214	Prestatyn East 1	Denbighshire 002B	38	
W01000287	Ffynnongroyw	Flintshire 001A	39	
W01000240	Rhyl West 2	Denbighshire 004E	40	
W01000221	Prestatyn South West 1	Denbighshire 003B	41	
W01000222	Prestatyn South West 1	Denbighshire 003C	48	
W01000216	Prestatyn East 3	Denbighshire 002D	59	
W01000238	Rhyl South West 3	Denbighshire 006C	60	
W01000201	Dyserth 2	Denbighshire 008B	70	
W01000227	Rhyl East 2	Denbighshire 004B	104	
W01000192	Corwen 1	Denbighshire 016A	134	
W01000223	Rhuddlan 1	Denbighshire 009B	162	
W01000208	Llangollen 1	Denbighshire 016C	200	
W01000159	Llangernyw	Conwy 014B	212	
W01000357	Dyffryn Ceiriog/Ceiriog Valley	Wrexham 019A	215	
W01000468	Llanrhaeadr-ym-Mochnant	Powys 001B	251	
W01000245	St. Asaph East	Denbighshire 010A	260	
W01000082	Llandderfel & Llanuwchllyn 1	Gwynedd 015C	267	
W01000205	Llandrillo	Denbighshire 016B	268	
W01000225	Rhuddlan 3	Denbighshire 009D	284	
W01000272	Cilcain	Flintshire 006D	327	
W01000310	Llanfynydd	Flintshire 020D	358	
W01000271	Caerwys 2	Flintshire 006C	359	
W01000246	St. Asaph West	Denbighshire 010B	430	

LSOA Code	LSOA Name	ONS LSOA Name	Flood Risk - National Rank	ONS = Office of National Statistics
W01000209	Llangollen 2	Denbighshire 016D	435	
W01000232	Rhyl South East 2	Denbighshire 005B	445	
W01000358	Dyffryn Ceiriog/Ceiriog Valley	Wrexham 019B	449	
W01000211	Llanrhaeadr-yng-Nghinmeirch	Denbighshire 012D	450	
W01000298	Gronant	Flintshire 001B	461	
W01000230	Rhyl South 2	Denbighshire 007B	463	
W01000193	Corwen 2	Denbighshire 015A	466	
W01000122	Betws yn Rhos	Conwy 014A	467	
W01000140	Gele 1	Conwy 010B	471	
W01000210	Llangollen 3	Denbighshire 016E	528	
W01000083	Llandderfel & Llanuwchllyn 2	Gwynedd 015D	541	
W01000162	Llansannan	Conwy 014C	550	
W01000229	Rhyl South 1	Denbighshire 007A	557	
W01000191	Bodelwyddan	Denbighshire 009A	585	
W01000389	Llangollen Rural	Wrexham 017D	601	
W01000242	Ruthin 1	Denbighshire 014A	609	
W01000198	Denbigh Upper/Henllan 1	Denbighshire 011B	638	
W01000231	Rhyl South East 1	Denbighshire 005A	642	
W01000197	Denbigh Lower 3	Denbighshire 012C	647	
W01000408	Penycae and Ruabon South 2	Wrexham 013D	668	
W01000469	Llanrhaeadr-ym-Mochnant/Llansi	Powys 001C	687	
W01000190	Uwchaled	Conwy 014D	724	
W01000199	Denbigh Upper/Henllan 2	Denbighshire 011C	734	
W01000213	Prestatyn Central 2	Denbighshire 002A	754	
W01000248	Tremeirchion	Denbighshire 008D	758	
W01000206	Llandyrnog	Denbighshire 013C	766	
W01000196	Denbigh Lower 2	Denbighshire 012B	774	
W01000270	Caerwys 1	Flintshire 006B	785	
W01000339	Treuddyn	Flintshire 019D	786	
W01000247	Trefnant	Denbighshire 010C	803	
W01000354	Cefn 1	Wrexham 017A	832	
W01000207	Llanfair Dyffryn Clwyd/Gwyddel	Denbighshire 015C	871	
W01000202	Efenechtyd	Denbighshire 015B	890	
W01000217	Prestatyn Meliden	Denbighshire 008C	908	
W01000203	Llanarmon-yn-Ial/Llandegla	Denbighshire 013A	917	
W01000195	Denbigh Lower 1	Denbighshire 012A	924	
W01000194	Denbigh Central	Denbighshire 011A	949	

LSOA Code	LSOA Name	ONS LSOA Name	Flood Risk - National Rank	ONS = Office of National Statistics
W01000361	Chirk South	Wrexham 019E	956	
W01000338	Trelawnyd and Gwaenysgor	Flintshire 001C	962	
W01000398	Minera 1	Wrexham 013A	971	
W01000243	Ruthin 2	Denbighshire 014B	989	
W01000200	Dyserth 1	Denbighshire 008A	999	
W01000299	Gwernaffield	Flintshire 019A	1044	
W01000212	Prestatyn Central 1	Denbighshire 003A	1049	
W01000233	Rhyl South East 3	Denbighshire 005C	1064	
W01000204	Llanbedr Dyffryn Clwyd/Llangyn	Denbighshire 013B	1103	
W01000300	Gwernymynydd	Flintshire 019B	1115	
W01000399	Minera 2	Wrexham 013B	1134	
W01000234	Rhyl South East 4	Denbighshire 007C	1159	
W01000228	Rhyl East 3	Denbighshire 004C	1159	
W01000340	Whitford	Flintshire 002C	1159	
W01000244	Ruthin 3	Denbighshire 014C	1159	
W01000224	Rhuddlan 2	Denbighshire 009C	1159	
W01000215	Prestatyn East 2	Denbighshire 002C	1159	



Flood Risk Maps

Flood Risk Maps

We produce detailed flood maps (see the map on the left on the previous page) that show the potential risk of flooding. These flood maps are available on the Environment Agency web pages What's in your backyard?

<http://www.environment-agency.gov.uk/homeandleisure/default.aspx>

Flood zone 2 – best estimate of the areas of land between Zone 3 and the extent of the flood from rivers or the sea with a 1000 to 1 chance of flooding in any year. It includes those areas defined in flood zone 3

Flood zone 3 – best estimate of the areas of land with a 100 to 1 chance (or greater) of flooding each year from rivers, or with a 200 to 1 chance (or greater) of flooding each year from the sea.

Flood Storage Area - may also be referred to as a balancing reservoir, storage basin or balancing pond. Its purpose is to attenuate an incoming flood peak to a flow level that can be accepted by the downstream channel. It may also delay the timing of a flood peak so that its volume is discharged over a longer interval.

Development Advice Maps

The Welsh Government Technical Advice Note TAN15 Development and Flood Risk gives technical guidance in relation to development and flooding.

<http://wales.gov.uk/topics/planning/policy/tans/tan15/>

TAN15 is supported by Development Advice Maps (DAM). The map on the right on the previous page shows the main rivers and the flooding zones shown on the Development Advice Maps.

Zone B - Areas known to have been flooded in the past evidenced by sedimentary deposits.

Zone C1 - Areas of the floodplain that are developed and served by significant infrastructure, including flood defences.

Zone C2 - Areas of the floodplain without significant flood defence infrastructure

Main rivers – The watercourses shown as main rivers on the second map above right are designated by Defra. Natural Resources Wales has permissive powers to carry out flood defence works, maintenance and operational activities for main rivers only.

Links to further information:

More information and advice on flooding: <http://naturalresourceswales.gov.uk/alerts/>

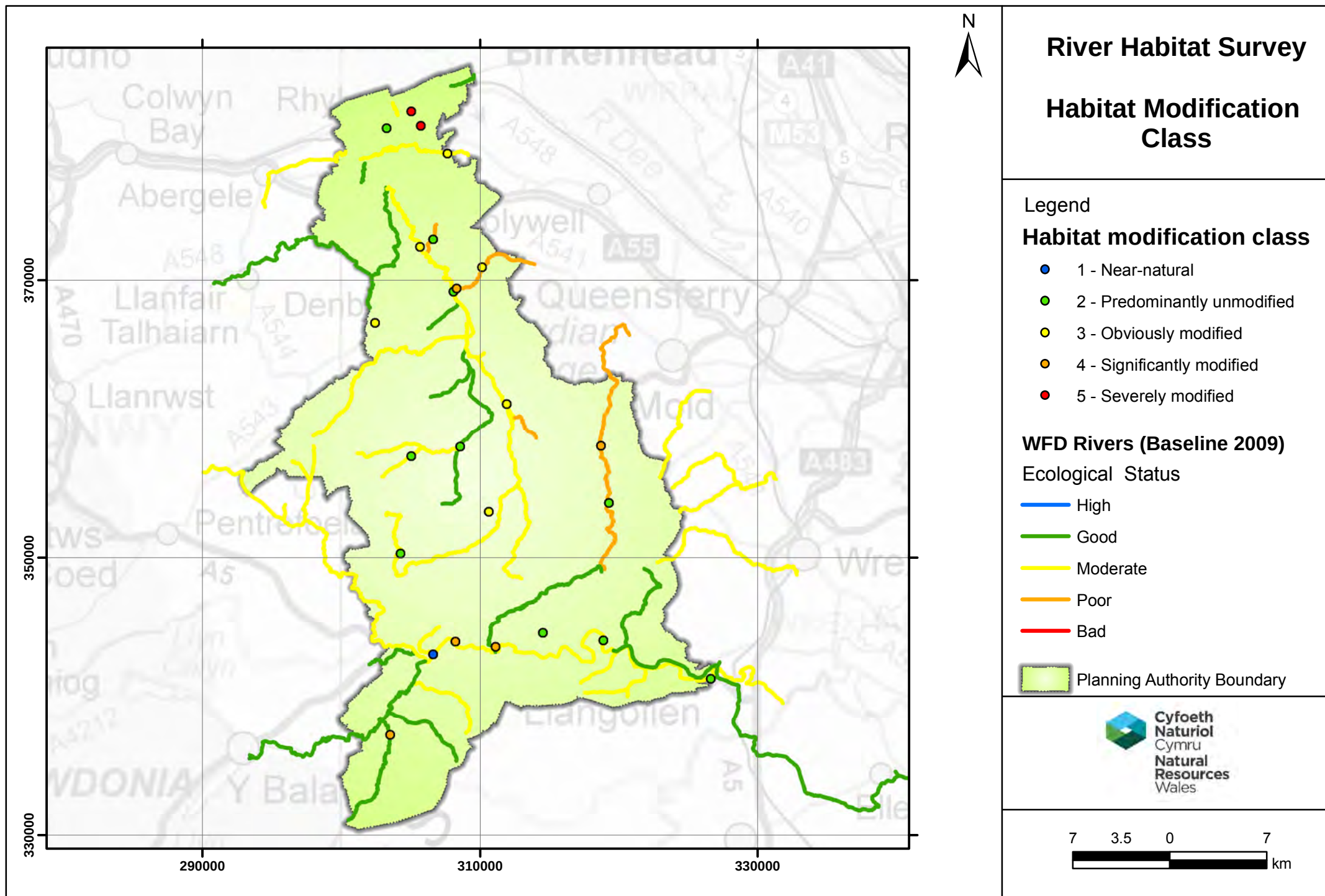
Use the 'What's in your backyard?' facility to find out if an area is at risk by entering in the postcode.

Environment Agency - What's in your backyard? (<http://www.environment-agency.gov.uk/homeandleisure/37793.aspx>)

The Development Advice Map (DAM) for use with Technical Advice Note (TAN) 15 is available as an Interactive Development Advice Map: <http://data.wales.gov.uk/apps/floodmapping/>

There is also an early warning system available for people who live in high risk areas called the 'Flood Warning' system.

Ring **0845 988 1188** to see if you can sign up to the free service. Warnings can be delivered by phone, text, email, fax or pager.



River Habitat Survey Sites

Habitat Modification Class:

1 - Near-natural 2 - Predominantly unmodified 3 - Obviously modified 4 - Significantly modified 5 - Severely modified

E = extensive P = present Y = present (blank if absent)

River	Site Grid Reference	Habitat Modification Class	Tree Shading	Giant Hogweed	Himalayan Balsam	Japanese Knotweed
CLWYD	SJ0807669145	2	P		Y	
UNNAMED	SJ0501882134	5				
UNNAMED	SJ0571381083	5	P			
UNNAMED	SJ0326780913	2	P			
AFON CHWILER/WHEELER	SJ0829669391	4	P		Y	
TRUB AFON & MIERCHIO	SJ0243666924	3	E			
CLWYD	SJ1190561045	3	E			
TRIB OF DEE	SJ0350037200	4	P			
DEE	SJ0660043000	1	P			
MORWYNION (DEE)	SJ1110443535	4	P			
DEE	SJ1886843997	2	P			
DEE	SJ0821343929	4	P			
TRIB OF DEE	SJ1452444557	2	E			
DEE	SJ2661341257	2	P		Y	
TRIB. OF CLWYD	SJ0762579085	3	E			
TRIB. OF CLWYD	SJ1062353271	3	E			
TRIB. OF CLWYD	SJ0424850272	2	P			
CORRIS	SJ0502257263	2	E			
CLYWEDOG	SJ0854257951	2	E			
ALUN	SJ1925353901	2	P			
ALUN	SJ1869358022	4	E			
CLWYD	SJ0567272350	3	E		Y	
BACH	SJ0660172893	2	E			
WHEELER	SJ1014170906	3	E		Y	

River Habitat Survey

The River Habitat Survey (RHS) baseline survey is a major habitat survey of streams and rivers in England, Wales and the Isle of Man that was carried out, most recently, between May 2006 and September 2008.

The RHS is a standard field survey of 500 metre stretches of river. Data are collected about the physical character of the banks and channel. This includes specific details about the bank and channel structure such as natural features, artificial modifications, land-use and bankside vegetation structure. Other key features and modifications (for example, the extent of tree shading and the presence of invasive species) are recorded as absent, present (up to 33 per cent of the site) or extensive (more than 33 per cent) across the 500m stretch.

Note: The main aim of RHS baseline surveys is to provide an authoritative assessment of the physical character of river habitats and assess changes across the whole of England and Wales. The sample size is not big enough to provide statistically valid summary results at scales smaller than this, but the results are indicative on a site basis.

Habitat Modification Class

The Habitat Modification Class (HMC) is based on an assessment of the presence and extent of artificial modifications: bank and channel resectioning; bank and channel reinforcement; culverts and bridges; fords; weirs, dams and sluices; in-stream deflectors and drainage outfalls; embankments and artificial berms (two-stage channels); bankside trampling by livestock.

Where there are long stretches of reinforcement or resectioning, the river is less likely to be able to offer habitats for wildlife.

Riverside trees and shading

Trees are an important feature of river channel and riparian habitats. They help to protect banks by forming a natural barrier to erosion, due to the binding effect of their roots. Trees also act as habitats in their own right. Exposed roots form suitable shelters for otters, overhanging branches act as perches for kingfishers, and fine roots create shelter for invertebrates and fish. Shading of the channel from riverside trees can be important for regulating the temperature of the water, particularly for smaller headwater streams.

Invasive non-native plants on river banks

RHS collects data on three invasive non-native plants - Himalayan balsam, Japanese knotweed and giant hogweed. These plants can cause problems by displacing the natural plant species and also causing bank erosion when they die in winter. As RHS only records plants growing by the riverside, the results only show their distribution in riparian habitats. All these species are widespread elsewhere in the countryside and in particular along paths and railways. It is important to note that although our data may show these plants are not present at a particular site, this does not necessarily mean that they are not found along the river as a whole.

Himalayan balsam

Himalayan (or Indian) balsam (*Impatiens glandulifera*) grows in dense patches and suppresses the growth of native plants. In winter it dies, providing little shelter and food for wildlife and leaving bare river banks more susceptible to erosion.

Giant hogweed

Giant hogweed (*Heracleum mantegazzianum*) was introduced as an ornamental plant. It has since escaped from gardens and spread across the country, particularly along watercourses. The sap can cause serious blisters and skin irritation.

Japanese knotweed

Japanese knotweed (*Fallopia japonica*) was introduced to Britain in the early nineteenth Century and has spread through a range of habitats and along watercourses. It is very fast growing and can penetrate through concrete, causing structural damage to roads and buildings, as well as displacing native species.

Links to further information:

Environment Agency - The state of river habitats in England & Wales
<http://www.environment-agency.gov.uk/research/library/publications/123383.aspx>

River habitats in Wales: current state and character

<http://publications.environment-agency.gov.uk/pdf/GEHO0910BT AJ-E-E.pdf>

The National Forest Inventory

The map on the left on the previous page shows the National Forest Inventory.

This dataset provides a view of the extent and nature of woodlands in Wales. It records all woodland areas greater than 0.5 ha in area in urban and rural areas. National Inventory surveys have been carried out at 10-15 year intervals since 1924 so there is historic data available for comparison. The inventories used to be known as the National Inventory of Woodlands & Trees (NIWT). There are some differences in the survey information due to improvements in technology and the inclusion of urban woods.

Wales Urban Canopy Cover

The benefits of urban woodlands and trees are clear, and the need to protect them and increase their numbers is compelling:

- Providing ecosystem services – temperature regulation, habitat and biodiversity, water regulation, noise reduction, reduction in air pollution, aesthetic benefits.
- Supporting economic regeneration, e.g. through increased town centre shopping, higher property values and provision of employment.
- Their planting, maintenance and presence helps build community ('social capital'), pride and engagement, and reduces anti-social behaviour.
- Urban trees promote better health, both mental and physical

In its strategy for woodlands and trees, Woodlands for Wales, the Welsh Government states its aim to ensure that woodlands and trees play a greater and more valued role in towns and cities, improving quality of life and surroundings for people who live in urban areas.

The Wales Urban Canopy Cover dataset shows tree cover for two hundred and twenty urban areas across Wales. The study was carried out in 2006 and again in 2009. The data will be useful to formulate evidence-based policy on urban trees and to target towns and wards in need of trees.

We will publish a report on the Wales Urban Canopy Cover project early in 2014. This report drills down to Lower Super Output Area level and analyses the data in conjunction with the Wales Index of Multiple Deprivation. We also plan to provide reports at Local Authority and town level.

The map on the right on the previous page shows percentage tree cover for the urban areas in this planning authority.

The Wales average tree cover is 17%.

You can see the Wales Urban Canopy Cover data on the Forestry Commission Wales Map Viewer (in the Forestry Commission, Policy sub-folder)

<http://www.forestry.gov.uk/forestry/INFD-8A9FPS>

Links to further information:

Woodlands for Wales

<http://www.forestry.gov.uk/forestry/INFD-7GDE7A>

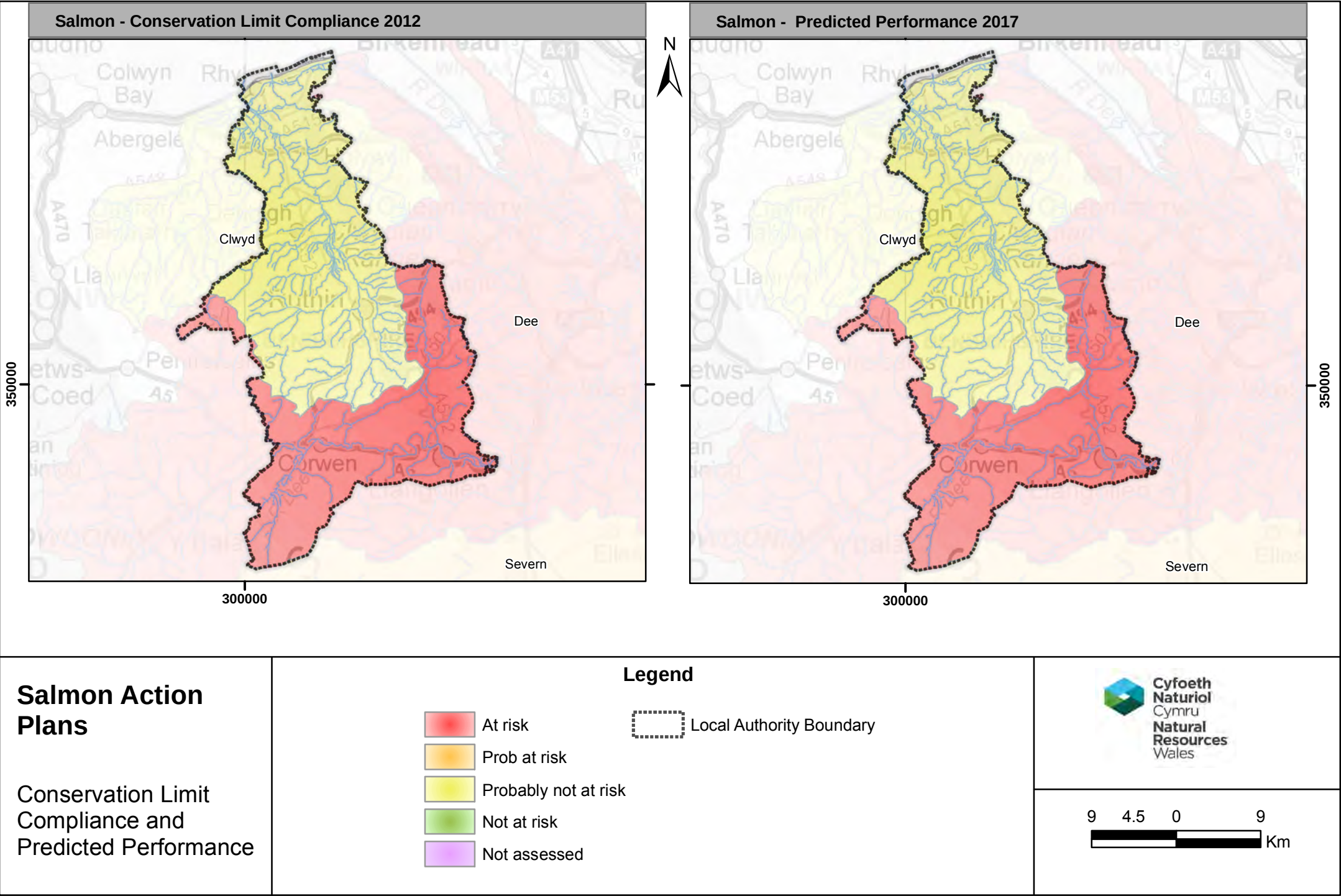
<http://wales.gov.uk/topics/environmentcountryside/forestry/woodlandsforwales/>

Forest Research website <http://www.forestry.gov.uk/fr/research>

Forest Research - Urban trees and greenspace in a changing climate <http://www.forestry.gov.uk/fr/urbanclimate>

Forestry Commission Wales - Urban Trees (benefits of urban trees and links to further info)

<http://www.forestry.gov.uk/forestry/INFD-8J2HGS>



Salmon Action Plans

Salmon Action Plans

The two maps on the previous page show current status and five year forecast status for principal salmon rivers indicating level of risk to salmon populations. The main issues for each river are shown in the table following.

Natural Resources Wales has a series of action plans, based on river catchments, setting out what needs to be done to support and restore salmon populations. Salmon Action Plans can be seen here: <http://www.environment-agency.gov.uk/research/library/publications/33967.aspx>

Natural Resources Wales' Salmon Management Strategy concentrates on four main objectives for the management of salmon:

- optimise number of salmon returning to home water fisheries
- maintain and improve fitness and diversity of salmon stocks
- optimise the total economic value of surplus stocks
- ensure necessary costs are met by beneficiaries

Objectives are addressed by means of local Salmon Action Plans (SAPs) – produced annually for each principal salmon river. Each SAP reviews the salmon stock and salmon fisheries on a particular river, and seeks to identify the main issues responsible for limiting performance. In addition, an annual assessment of performance is made and reported.

There are 23 principal salmon rivers in Wales (including the Severn, which the Environment Agency leads on). This list of principal salmon rivers was determined on catch size in the 1990's.

Key Issues Affecting Performance

A number of contributory factors that may constrain or adversely affect salmon stock performance have been identified. These include: exploitation (fishing); water quality; water quantity; river channel structure and siltation; and in-river obstructions to migration. The severity of each of these factors will be different from river to river. Even rivers where the salmon stock is performing well may have factors that are adversely affecting stocks.

- Channel structure and siltation are a key problem in most rivers across Wales. Intensive agriculture, forestry and the downstream impacts of water supply reservoirs impact on some rivers. New developments may give rise to local impacts by modifying channel structure and/or silt loadings.
- Water quality problems affect many rivers, and may be attributed to industrial discharges, agricultural pollution, metal mining, sewerage systems and acidification. Opportunities to improve water quality should be considered.
- Whilst major obstructions are thought to be significant on only a few rivers, their impact can be substantial. The effects are usually associated with historic mills, water supply, hydropower, aquaculture and tidal barrages, although new developments may give rise to new problems.

The annual assessment for principal salmon rivers includes current and forecast stock performance and main factors responsible for suppressing a river's performance.

<http://www.environment-agency.gov.uk/research/library/publications/33945.aspx>

Salmon Action Plans

Key Issues Affecting Performance

River	Exploitation	Water Quality	Water Quantity	Channel Structure and Siltation	Obstructions
Severn		X		X	X
Dee	X			X	X
Clwyd		X		X	

Severn		X		X	X
Dee	X			X	X
Clwyd		X		X	

List of Abbreviations

AMP	Asset Management Plan (Water Companies)	PM ₁₀	Particulate Matter – particles of diameter less than 10 µm
AQMA	Air Quality Management Area	RBD	River Basin District
BAP	Biodiversity Action Plan	rBWD	The revised EC Bathing Water Directive (2006/7/EC) that was transposed into UK law in 2008
BOD	Biochemical Oxygen Demand	RHS	River Habitat Survey
CAMS	Catchment Abstraction Management Strategies	RQO	River Quality Objective
cBWD	Current Bathing Water Directive	SA	Sensitive Area (as defined in the Urban Waste Water Treatment Directive)
COD	Chemical Oxygen Demand	SAC	Special Areas of Conservation (SAC). SACs are designated under the EC Habitats Directive
CSO	Combined Sewer Overflow (a combined sewer is one carrying foul sewage and surface water)	SAP	Salmon Action Plan
DCWW	Dŵr Cymru/Welsh Water	SEA	Strategic Environmental Assessment
Defra	Department of the Environment, Food and Rural Affairs	SOx	Sulphur oxides
EC	European Commission (When referring to bathing waters - bathing waters designated under the EC Bathing Waters Directive (76/160/EEC))	SPA	Special Protection Areas (SPA). SPAs are classified under the EC Wild Birds Directive (Council Directive 79/409/EEC on the conservation of wild birds).
EPR	Environmental Permitting Regulations – the new environmental permitting regime that replaces WML and IPPC	SPZ	Groundwater Source Protection Zone
GQA	General Quality Assessment	SSSI	Site of Special Scientific Interest Identified / notified by the Countryside Council for Wales under the Wildlife and Countryside Act 1981 for its importance to nature conservation.
IPPC	Integrated Pollution Prevention and Control – predecessor permitting regime to EPR	STW	Sewage Treatment Works
LA	Local Authority	TAN15	Technical Advice Note about Development and Flood Risk (published by the Welsh Government)
LSOA	Lower Layer Super Output Area – statistical area (containing a population of about 1,500 people). Used in Wales Index of Multiple Deprivation	TAN15 DAM	Development Advice Map (Used to determine when flood risk issues need to be taken into account in planning future development. Published by the Welsh Government.)
Natura 2000	Natura 2000 is the European Union-wide network of protected areas under the EC Habitats Directive (Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora). Includes SACs and SPAs.	UWWTD	Urban Waste Water Treatment Directive (91/271/EEC)
NEP	National Environment Programme	WG	Welsh Government
NGR	National Grid Reference (location of site)	WFD	EC Water Framework Directive (2000/60/EC)
Non-EC	(When referring to bathing waters) bathing waters not designated under the EC Bathing Waters Directive but monitored by Local Authorities	WIMD	Wales Index of Multiple Deprivation
NO _x	Nitrogen oxides (nitrous oxide and nitrogen dioxide)	WML	Waste Management Licence – now being superseded by EPR permits
NVZ	Nitrate Vulnerable Zone	WWTW	Waste Water Treatment Works i.e. sewage treatment works
OFWAT	The economic regulator for the water and sewerage industry in England and Wales		