



**Cyfoeth  
Naturiol  
Cymru  
Natural  
Resources  
Wales**

## Public Service Board - Gwynedd

Environmental information for well-being assessments







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Cymru  
Natural  
Resources  
Wales**

The Well-being of Future Generations Act (2015) requires public bodies to work together to improve economic, social, environmental and cultural well being in Wales.

### **Evidence Pack Contents:**

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*These maps should not be looked at in isolation, addressing well-being needs should be done using an integrated approach both within and between organisations by using relevant evidence and data.*



Noddir gan  
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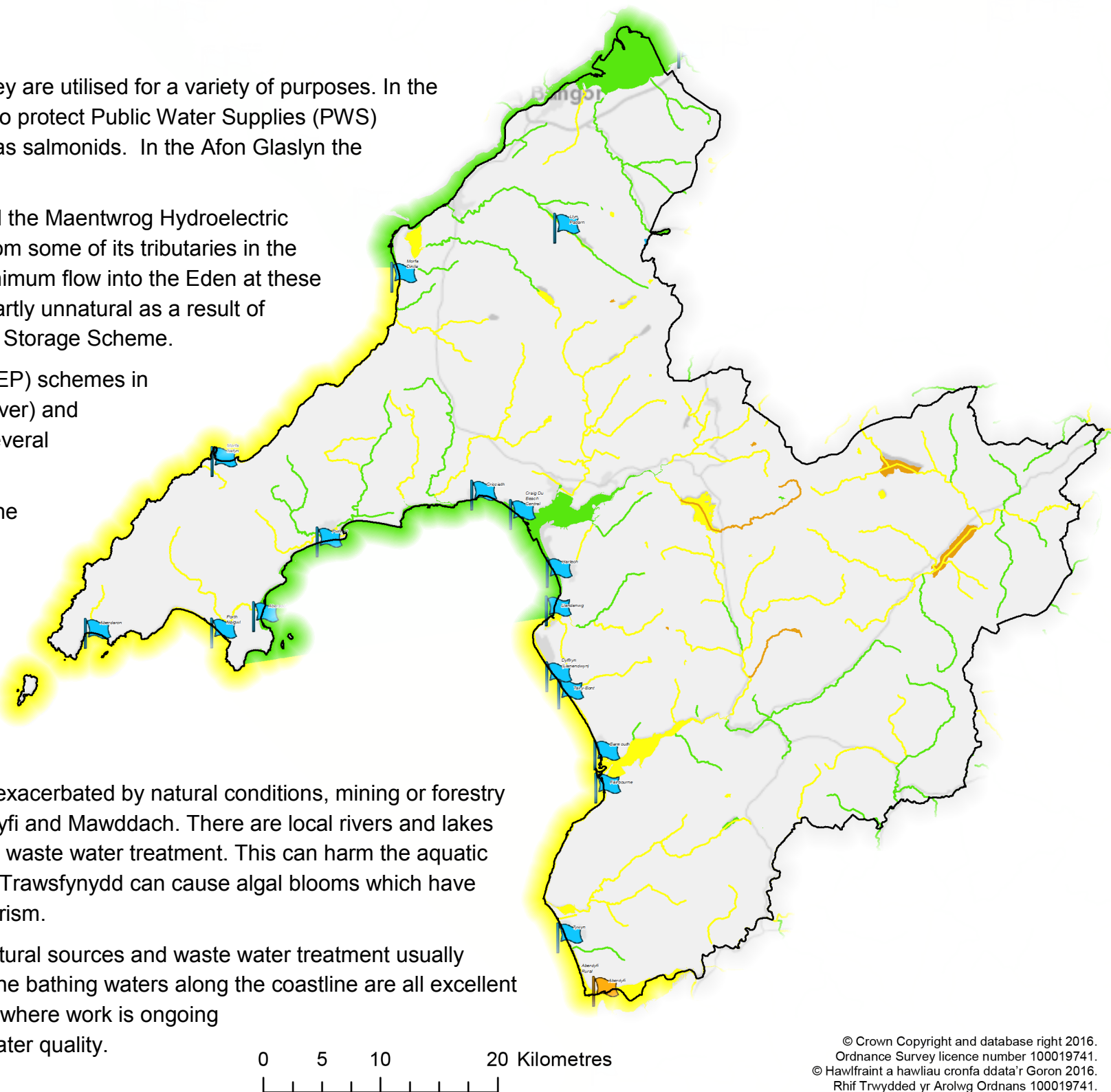
Gwynedd has many rivers which have restricted water availability as they are utilised for a variety of purposes. In the case of the Rivers Gwyrfaï and Dwyfor, further abstraction is restricted to protect Public Water Supplies (PWS) and the Special Area of Conservation (SAC) designated features such as salmonids. In the Afon Glaslyn the restricted abstraction protects fisheries.

In recent years there has been an increase in the number of small hydro-electric power (HEP) schemes in Gwynedd. These are classed as non-consumptive (as all water is returned back into the river) and considered to have little impact even though some of the depleted reaches can be up to several kilometres long.

	Bad
	Poor
	Moderate
	Good
	High

Acidification due to atmospheric deposition sometimes exacerbated by natural conditions, mining or forestry is also identified as a problem in parts of the Rivers Dyfi and Mawddach. There are local rivers and lakes impacted by excess phosphate from agriculture and waste water treatment. This can harm the aquatic ecology and in lakes such as Llyn Tegid and Llyn Trawsfynydd can cause algal blooms which have the potential to impact on human health and tourism.

Ongoing work to reduce bacteria from agricultural sources and waste water treatment usually ensures beaches remain clean for bathing. The bathing waters along the coastline are all excellent apart from Aberdyfi which is sufficient (2015) where work is ongoing with Dwr Cymru aiming to improve bathing water quality.



The **Water Framework Directive** requires the water quality/quantity of our rivers, lakes, groundwater, estuaries and coastline is assessed using ecological (fish, invertebrates, plants etc.) and chemical (nutrients, pesticides, etc.) monitoring.

Our waterbodies are assigned a status of health which is represented by colours on the map. Water bodies, that are classified as 'Bad', 'Poor' or 'Moderate' are failing the EU Water Framework Directive standards and these waterbodies will need to improve to at least 'Good' ecological status by 2027.

Our EU designated **bathing waters** are monitored from May to September for contamination from faecal indicator organisms. Bathing waters are classified annually according to the quality of the water (Excellent, Good, Sufficient, Poor). At the end of the 2015 season the beaches were classified and all designated bathing waters in Wales met the sufficient standard or above.

Our rivers, lakes, groundwater, estuaries, coastline and beaches provide us with important natural benefits, many of which contribute to the well-being of local communities and the wider population. These natural benefits include access to drinking water, clean rivers and seas for recreation and relaxation, income generation from business and industry, tourism, green energy production and angling. By working together to improve and maintain the quality of these watery assets we can deliver benefits for the environment, the local economy, health and quality of life.

## Further information

### What are the top five sources of bathing water pollution?

- Pollution from sewage – bacteria from sewage can enter our waters as a result of system failures or overflows or directly from sewage works.
- Water draining from farms and farmland – manure from livestock or poorly stored slurry can wash into rivers and streams resulting in faecal material entering the sea.
- Animals and birds on or near beaches - dog, bird and other animal faeces can affect bathing water as they often contain high levels of bacteria (much higher than treated human waste).
- Water draining from populated areas - water draining from urban areas following heavy rain can contain pollution from a variety of sources, including animal and bird faeces.
- Domestic sewage – misconnected drains and poorly located and maintained septic tanks can pollute surface water systems.

### Water Resources

Water companies in England & Wales have a statutory duty (as set out in in Section 37A-37D of the Water Industry Act 1991) to produce a water resources management plan (WRMP) every five years. The plan must set out how a water company intends to maintain the balance between supply and demand for water over a minimum 25 year period, while protecting the environment. A WRMP is complemented by a water company drought plan, which sets out the short-term operational steps they will take as a drought progresses to enhance available supplies, manage customer demand and minimise environmental impacts.

Through the WRMP and drought plan the water company should contribute to the delivery of Water Framework Directive objectives set out in river basin management plans (RBMPs) by:

- Setting out a secure and sustainable set of options to supply their our customers with water over the long-term, negating the need for the company to make unplanned abstractions therefore helping to build sustainable and resilient catchments
- Showing how they will implement alternative supply or demand management options where current abstraction is identified as causing or at risk of causing environmental damage, including schemes to prevent deterioration in status, achieve protected area objectives or improve water body status (potential)
- Showing how the plans reduce leakage and operational use of water
- Demonstrating how they will fulfil their obligation to promote water efficiency and for increased customer metering, thereby reducing abstraction and its impact on flows and groundwater levels
- Setting out how they will manage resources during a drought, including stating where and under what conditions they may seek drought permits / orders to take more water

Dŵr Cymru Welsh Water is responsible for supplying water to your area. For more information on their latest published WRMP and drought plan is available here: [WRMP](#) and [Drought Plan](#). Note that these plans are reviewed periodically and some information may have altered since publication. For the most up to date information, please contact the water company directly.

Dataset	Comments
EU Bathing Waters Directive data (NRW)	Data as required to meet The Bathing Water Regulations 2013
EU Water Framework Directive data (NRW)	Data as required to meet The Water Environment (Water Framework Directive)



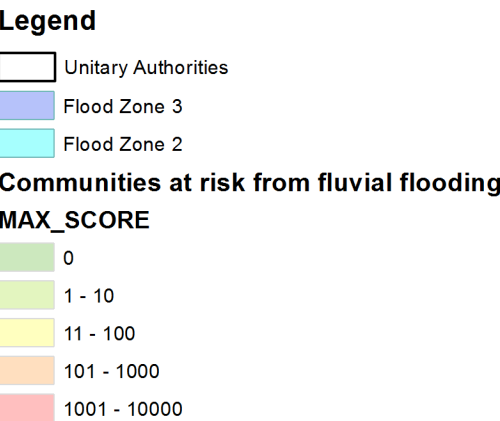
# The risk from flooding

**What does this mean locally?** NRW are responsible for managing flood risk from the sea and main rivers. In Gwynedd there are 6, 175 properties at risk . NRW provides a direct warning service to 2, 507 properties in 21 areas within the extreme flood outline which means that not all properties within these areas are signed up to the Flood Warning Service. There will also be properties and businesses at risk from other flood sources.

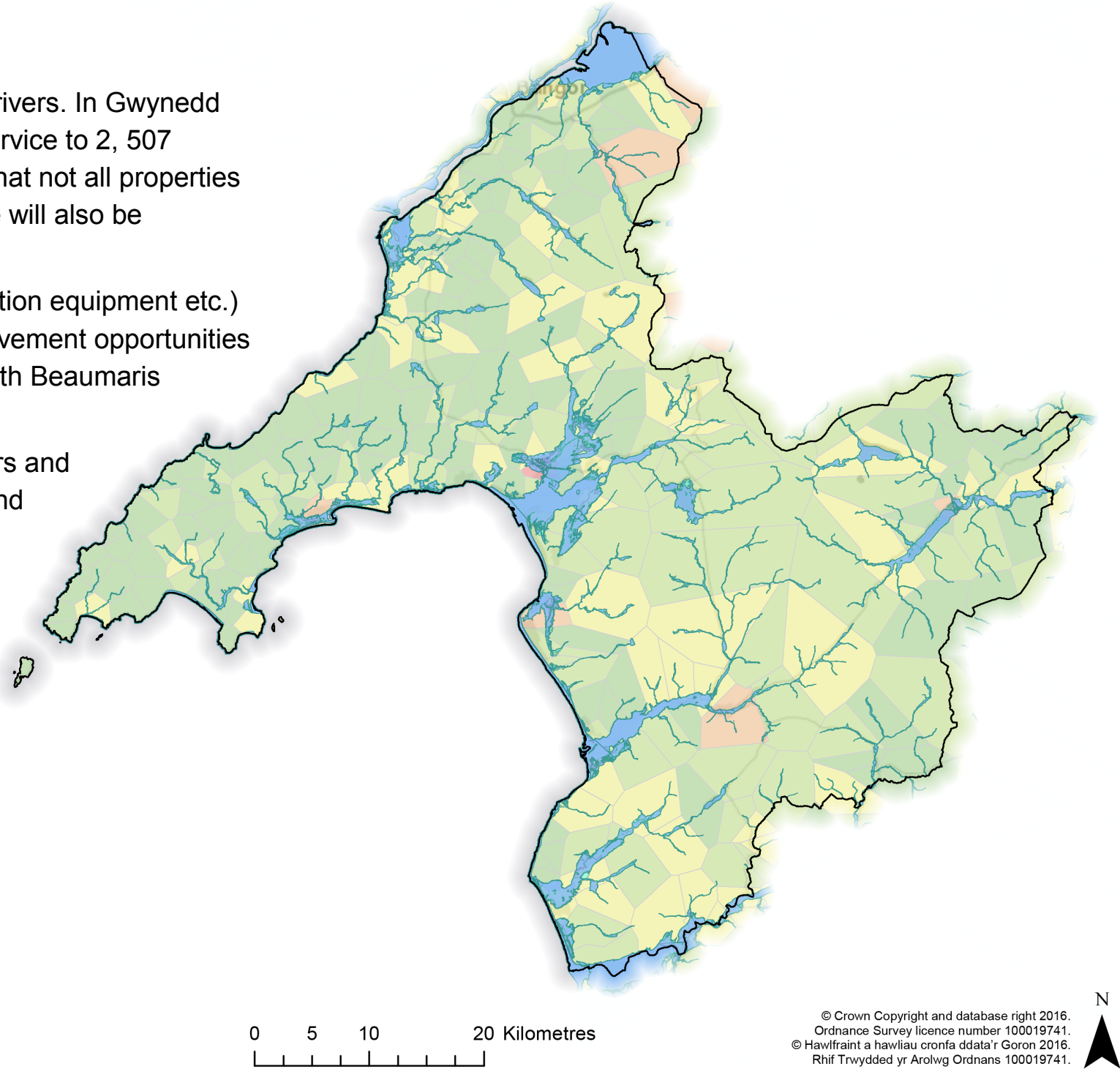
NRW have 21 failing assets (flood embankments, floodgates, emergency flood protection equipment etc.) in Gwynedd that require capital investment and are currently investigating flood improvement opportunities within two areas that are high on our communities at risk register and are engaging with Beaumaris Town council on the development of their community flood plan.

Continuing constraints on budgets and resources mean that in order to manage repairs and improvements, NRW have had to take a risk based approach and prioritises people and properties over farm land.

NRW are currently investigating flood improvement opportunities within three areas that are high on the communities at risk register. We are seeking capital investment to address 5 of our failing assets within the county.



\* Score is a relative risk score and not the number of properties at risk of flooding.



**What does this map mean?** Flooding occurs when water arrives in a place quicker than it can drain away. This is usually rainfall, but can be from other sources. This causes estuaries, rivers, ditches, drains or sewers to overflow allowing water to flood surrounding houses, business, farmland and infrastructure. This map shows the different flood risk level **if there were no flood defences**. These are:

Flood Zone 3 ■ – High Probability of flooding. Land assessed as having a greater than 1% probability of flooding (or from the sea of greater than 0.5%) in any year.

Flood Zone 2 ■ – Medium probability of flooding - 1% – 0.1%. Or annual probability of sea flooding (0.5% – 0.1%) in any year.

Map areas without blue shading are unlikely to be flooded by rivers and very unlikely to be flooded by the sea - Flood Zone 1. In these areas there is less than a 0.1 per cent (1 in 1000) chance of flooding occurring each year. The majority of Wales falls within this area. Due to climate change, winter rainfall in Wales is projected to increase by an average of about 14% by the 2050s. Flooding will therefore continue to be a key threat to many communities. However, increased resilience the natural environment and well planned developments can help provide resilience to flooding. The coloured shading on the map show the likely severity of flooding should it occur. This is a “traffic light” method – Green is low risk and Red the worst. The severity is based on the number of properties within the community likely to be affected.

**What does this mean for well-** Flooding is the most frequent type of ‘natural’ disaster affecting home and businesses and often disrupts the normal functioning of whole communities. The problem is estimated to cost the UK

£1billion per year. The consequences of flooding are not just financial, however, and even modest flooding events can significantly impact on the physical and mental wellbeing of the individuals affected for many years after the actual flooding event. From a health perspective, quite often the worst affected are the more vulnerable in society.



# Further information





# The diversity of our landscapes

## What does this mean locally?

A principle characteristic of the area is its dramatic chain of mountains, upland hills, ridges and moorland, dived by valleys and estuaries in close proximity to the coast. This gives North West Wales a particular strong character and sense of place.

Yr Wyddfa (Snowdon) is the most recognisable peak of the area and an iconic landscape of Wales, with mountain massifs extending southwards to Machynlleth and near Bala, all with distinctive skylines.

Adjacent moorlands allow open views of the uplands and contribute to the area’s wild and tranquil qualities.

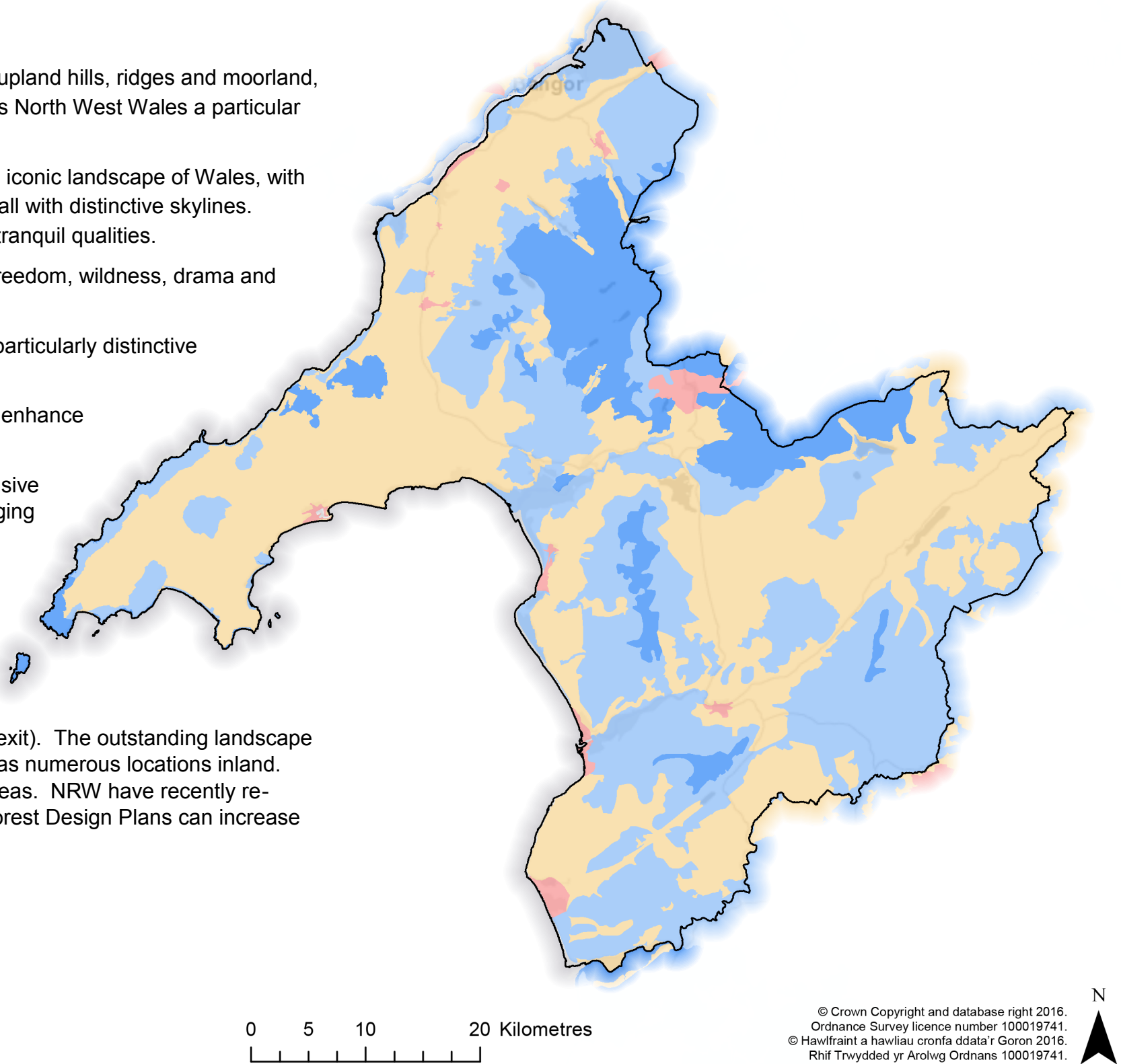
Expansive unrestricted aerial views from the peaks and uplands provide a great sense of freedom, wildness, drama and exposure.

Historic pastoral landscapes, slate and copper mining and the castles of King Edward are particularly distinctive cultural features.

Snowdonia National Park covers much of these area and was designated to conserve and enhance Natural Beauty, promote access and recreation. It is also a Dark Sky Reserve.

The Lyn Peninsular is distinctly different comprising scenic headlands and bays with expansive unrestricted sea views and isolated upland hills above a rolling pastoral plateau. Long ranging views east and southwards take in the Snowdonia skyline and Tremadog Bay. There are several islands just off the peninsular, with Bardsey being the largest. The Llyn Peninsular AONB covers much of these areas and was designated to conserve and enhance Natural Beauty.

There are some issues as a result of changes to farming practices and inappropriate development of land management issues may impact on landscape, particularly agricultural land in the uplands. These issues are in part due to changes in funding (agricultural funding - Headage payment to Single Farm Payment and possibly in future Brexit). The outstanding landscape supports a thriving tourist industry, particularly the Llyn and Meirionnydd coastline, as well as numerous locations inland. Loss of habitat and species and increase in scrub development is also an issue in some areas. NRW have recently re-modelled the forest block in the Abergwyngregyn area to better fit in with the landscape. Forest Design Plans can increase species diversity.



**Legend**

Unitary Authorities

**LANDMAP Visual Sensory - Map 4.1**

Low

Moderate

High

Outstanding

## What does this map mean?

Landscapes are defined by the interrelationships between people, place and resources. As places they are identified and recognised by their character, component parts, quality and local distinctiveness. People relate to landscapes as places to live, work and enjoy, they contribute to our sense of place, identity, wellbeing and quality of life. Landscapes reflect the complex diversity, nature and state of a range of natural resources, human influences, preferences and land use decisions. It is a useful lens through which to explore interactions between people, environment and economic activity. LANDMAP is an all-Wales landscape information resource where key landscape characteristics, qualities and influences on the landscape are recorded and evaluated. It is used throughout Wales and endorsed by Welsh Government planning policy.

## What does this mean for well-being

Our experience and interaction with landscape can have a positive effect on our health and wellbeing. Attractive landscapes, natural beauty, cultural heritage and tranquillity provide opportunities and benefits for healthy communities, recreation, tourism and economic activity. Many of Wales’ landscape areas and characteristics are rare, unique and valued. Local landscape can provide an important link to our sense of national pride, culture and local identity. Landscapes provide places and opportunities for access and enjoyment, enticing healthy lifestyles and reducing stress in all age groups. There is an economic value in landscapes as destinations for visitors, but also as places for communities to prosper. Welsh landscapes are worth £8 billion/year (with £4.2 billion from tourism).



## Further information (LANDMAP)

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**LANDMAP** is an all-Wales landscape information resource where key landscape characteristics, qualities and influences on the landscape are recorded and evaluated. Used throughout Wales, and endorsed by Planning Policy Wales (5.3.13), it is an important **information resource for informing local policy, guidance and decision making**

LANDMAP: introducing the five maps and datasets	
<b>Geological Landscape</b> Landscapes that are defined and shaped by bedrock, surface processes and hydrology are mapped into areas of similar landscape character to explain, and take into account, the influences shaping the landscape today.	
<b>Landscape Habitats</b> Patterns of semi natural habitats and land use cover contribute to diversity, seasonal change and contrast. Broad ecosystems are mapped identifying habitats, features and mosaics and their identifiable character and value in a landscape context.	
<b>Visual and Sensory</b> Landscape characteristics and qualities as defined by landform, land cover, settlement patterns, distribution of features, views and sensory experience. Identifying what is locally distinctive or commonplace, highly valued and locally important.	
<b>Historic Landscape</b> Physical remains, land use, patterns and features that are prominent and contribute to the overall historic character of the present landscape.	
<b>Cultural Landscape</b> Mapping contemporary cultural essence and sense of place from how human activity visibly shapes the landscape to the way in which we respond to landscape, for example through art, literature, folklore and place names.	
Why use LANDMAP?	Advantages as an environmental PSB common dataset
LANDMAP describes baseline environmental conditions for landscape to support assessments	LANDMAP covers all landscapes, designated and non-designated, natural, rural, peri-urban and smaller urban areas, (not the core of Cardiff and Swansea) including inland waters and coastal areas to the low water mark
LANDMAP can be presented in the form of maps cut to PSB areas, accompanied by surveys	Information is available as a nationally consistent Geographical Information System (GIS) map and survey data set that is publically available information
LANDMAP provides landscape evidence for well-being assessments, plan-making authorities and decision making processes	A comprehensive, quality assured, baseline of environmental, cultural and heritage information to assist with sustainable decision-making at a range of levels from local to national scale whilst ensuring transparency in decision-making. LANDMAP offers the potential to compare local landscape information with other PSBs and with the national picture
LANDMAP is an existing resourced programme of work with inbuilt monitoring	Allowing focus and resources to be aimed at the analysis, rather than collection, of the data. Updating allows long term change as a result of a plan to be monitored
Maps, statistics, landscape summaries and landscape recommendations are already produced	Further interpretation is required to assess the meaning of the data in terms of decision making but this is aided by the wealth of information available and the simplicity of creating thematic maps to visually interpret key landscape information
Existing LANDMAP links with local authorities	LANDMAP is already widely used in local planning authorities, much of the data has been collected in partnership with planning authorities

A globally responsible Wales	A prosperous Wales
Many of Wales' landscape areas and characteristics are rare, unique and valued, a resource to conserve and work carefully with. Some landscapes are likely to have a higher capacity to evolve and accommodate change to meet current and future needs of society.	Wales' iconic landscapes are nationally recognised for their scenic quality, natural and built heritage and culture. There is an economic value in landscapes as destinations for visitors, but also as places for communities to prosper. Welsh landscapes are worth £8 billion/year
A Wales of vibrant culture and thriving welsh	A resilient Wales
Wales is a cultural landscape that has been managed to meet the needs of its people. The Welsh language and man's use and response to land is evident in landscape place names, physical remains, myths and legends, this is part of the nation's heritage. Landscape provides an important link to our sense of national identity.	Changes in landscapes over time reflect changes in both natural and human activity often in response to shocks and resilience. This will continue to evolve and adapt in response to climate change, population growth, development and needs for food, energy, water management and health. Opportunities and risks for resilient ecosystems and the benefits they provide can often be observed and assessed using landscape character data from local, PSB
A Wales of cohesive communities	A healthier Wales
Local landscapes are important to urban and rural communities as social places for people to connect together. Communities value their aesthetic and cultural locality and frequently connect this to a sense of local identity and belonging.	Landscapes provide settings within which opportunities for access and enjoyment can be found, enticing people and contributing to healthy lifestyles and reducing stress in all age groups. Natural play improves child development and patients in hospital with a view of
Sustainable development principle – the 5	A more equal Wales
Landscapes can provide a useful lens through which to discuss common objectives and identify opportunities for collaboration and integration – for example, what do we want our landscape to look like in 50 years time?	The European Landscape Convention advocates that 'all landscapes matter'. Management planning and change can be explained to communities using landscape character. People relate to landscape, offering more equal opportunities for engagement and participation by



# The resilience of ecosystems

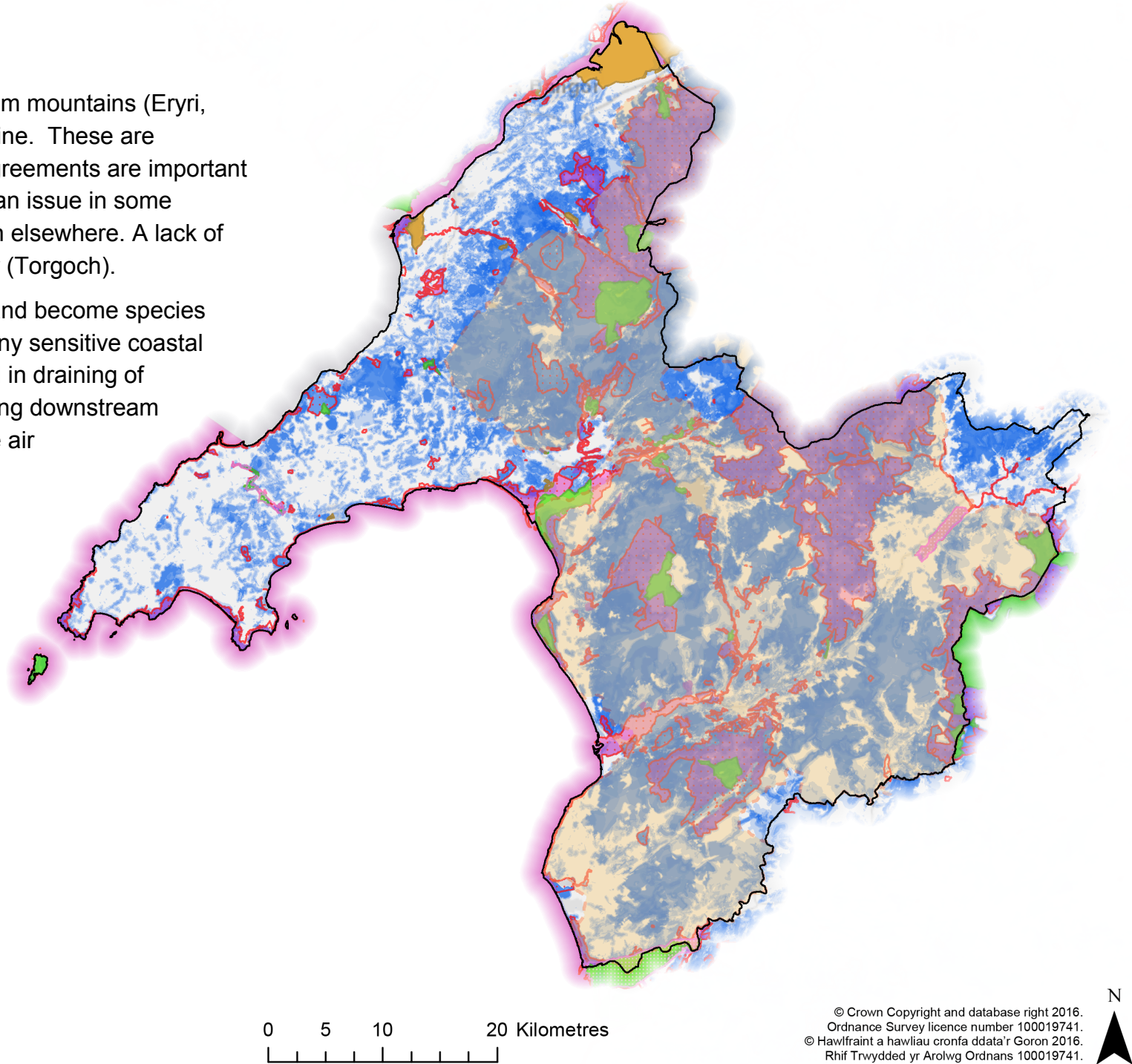
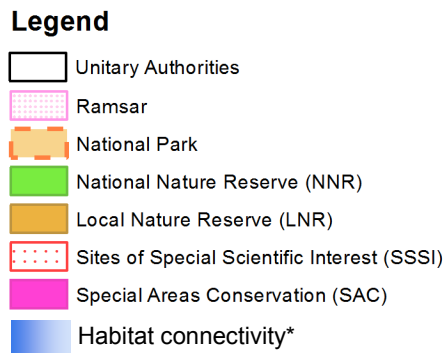
## What does this mean locally?

Gwynedd has a wealth of national and internationally designated sites ranging from mountains (Eryri, Carneddau), rivers, fens and wetlands, upland bogs and heaths, coastal and marine. These are supported and surrounded by local sites that are not designated. Management agreements are important to maintain some habitats in optimum conditions. Although land abandonment is an issue in some locations, overgrazing and inappropriate burning of some sites is causing concern elsewhere. A lack of high quality habitat is causing the decline of some niche species like Marsh fritillaries and Arctic char (Torgoch).

Difficult to graze habitats like wetlands are often abandoned and are then dominated by rank grass and become species poor, often succeeding to willow carr. Coastal erosion and sea level rise will adversely impact on many sensitive coastal habitats in the coming years. Historical land improvement grants and agricultural advice has resulted in draining of wetlands and peatlands. This has resulted in faster water runoff - potentially increasing risk of flooding downstream as well as drying of the peat soil resulting in peat being lost and carbon dioxide being released to the air contributing to climate change. Ongoing work in blocking up these ditches is improving the situation.

This can result in conflict as agriculture is concentrated on the better quality and well drained land, wetter habitats often cause practical difficulties for livestock management (loss of condition)

Coastal realignment is difficult to achieve without considerable liaison and multi-Agency co-operation. Ongoing work on the ground delivering enhancement projects will increase aquatic and riparian habitat connectivity. Grazing co-operatives can offer novel solutions to help get difficult sites grazed and change perceptions of those areas amongst land managers. There are opportunities for community involvement projects to tackle issues like scrub invasion.



## What does this map mean?

This map shows the areas of designated, or 'special' wildlife sites in the PSB. There are several types of designations both local, national and international. Many of these overlap but the basic, fundamental building block of designated sites under UK law is the Site of Special Scientific Interest. Special Areas of Conservation and Special Protected Areas are international designations. In most cases such sites are privately owned and have a multi-functional land use e.g. livestock grazing.

Connectivity is the degree to which wildlife can move in the landscape, and is important for it to survive and adapt to change. The map shows where connectivity is likely to be relatively high for a wide range of wildlife, and reflects the extent and diversity of wildlife habitats in the landscape. More detailed versions of these maps are available<sup>1</sup>, and have many uses to prioritise actions for wildlife and to support the protected sites.

Ecosystem resilience means how well ecosystems can deal with disturbances, either by resisting them or adapting to them. Resilient ecosystems are able to carry on delivering environmental services and benefits despite these disturbances.

Resilience is considered in terms of the diversity of species and habitats, their extent, their condition, the connections between them and their ability to adapt to changes, for example a changing climate. In Wales all ecosystems have problems with one or more of these criteria that contribute to resilience. This means that their capacity to provide ecosystems services and benefits may be at risk. NRW has multiple roles, including a duty to select and legally notify SSSIs as well as to be consulted over operations, direct land management, and a general duty to conserve biodiversity.

## What does this mean for well-being

Protected sites make a vital contribution to our economic prosperity and are places for scientific research and study, where science leads exemplary management. It has been estimated that protected sites contribute £128 m annually to the Welsh economy (Benefits of SSSIs, Defra 2011).

NRW partnerships with land managers directly contributes about £2 million pounds each year. Protected sites, particularly those on common land or open access land are a community environmental asset providing access and recreation opportunities that contribute to well-being. Although protected for nature and wildlife, they provide a connection between people and their environment. They can also be a fundamental part of the local landscape and its cultural heritage.

Animals, plants and other organisms and the habitats they live in play a wide range of functional roles in ecosystems and therefore in the processes that underpin the benefits that society relies on such as food production, clean water or pollination. If they are not resilient, ecosystems are not able to deliver the services and benefits that we are ultimately reliant on.

## Further information

For further detail on the habitat connectivity modelling see *CCW, 2013*. The mapping presented is for broadleaved woodland, heathland, unimproved grassland, dunes, fens and bogs, each (except woodland and dunes) in upland and lowland versions. The network maps can be used to help understand the significance of habitat patches in the landscape and the functional relationships between them. As such, they provide a general guide to the location of habitat restoration and expansion. Here we have merged the habitats to give an overall picture of habitat connectivity. The modelling was carried out at two complimentary levels:

- 1) Core networks, modelled for focal species requiring relatively large areas of habitat but which have poor powers of dispersal.
- 2) Focal networks, modelled for focal species requiring only small areas of habitat and that have moderately good powers of dispersal.

The network maps have many potential applications, including: natural resource planning, spatial planning (e.g. Local and Rural Development Plans), ecosystem services mapping, agri-environment targeting, access plans, economic development policies, green infrastructure plans, National Park and AONB Management Plans, site notification programme, biodiversity offsetting and habitat banking, landscape-scale restoration projects e.g. LIFE and Heritage Lottery Fund, Local Biodiversity Action Plans (LBAP).

However, the network maps also need to be used with caution, and their limitations should be recognised. They require interpretation and **do not** provide specific prescriptions of where to develop new habitats and ecosystems.

Many of the major issues affecting ecosystem functioning and biodiversity conservation result from the loss and fragmentation of natural habitats. Habitat loss and fragmentation have gone on for thousands of years as natural habitats have been cultivated and modified, or replaced by artificial systems and the built environment. However, many serious losses have occurred only relatively recently. For example, between 1930 and 1980 an estimated 9% of the ancient semi-natural woodland in Wales was cleared, and a further 42% converted to plantation (Spencer & Kirby, 1992). More extreme is the astonishing 97% loss of lowland semi-natural grasslands in England and Wales in the 20th century (Fuller, 1987, described in Blackstock et al., 2010). Nature conservation legislation and greater public awareness have reduced the rates of decline, but losses still continue, especially loss of smaller patches of habitat that slip below levels required for protection.

connectivity can be thought of as the inverse of fragmentation, and actions to reverse or mitigate the effects of fragmentation will improve connectivity. However, there is more to it than that, and it is not simply about physical connectedness and ‘joining things up’. To its detriment, connectivity is often thought of in this way, and equated with features such as linear corridors and dormice bridges. Whilst these features have a place, they are only part of a wide array of approaches that can improve connectivity, from management of individual sites to regional landuse strategies. Good management of habitat patches is an important first step, as it can increase the size and fitness of populations, making species more able and likely to move.

Dataset
Habitat connectivity
Ramsar
National Nature Reserve (NNR)
Local Nature Reserve (LNR)
Sites of Special Scientific Interest (SSSI)
Special Area of Conservation (SAC)

*CCW [J. Latham, J. Sherry & J. Rothwell]* (2013) Ecological Connectivity and Biodiversity Prioritisation in the Terrestrial Environment of Wales

*Spencer, J.W. & Kirby, K.J.,* (1992). An inventory of ancient woodland for England and Wales, Biological Conservation 62, 77-93.

*Blackstock, T.H., Howe, E.A., Stevens, J.P., Burrows, C.R. & Jones, P.S.* (2010) Habitats of Wales: a comprehensive field survey 1979-1997. University of Wales Press, Cardiff.



# Managing our seas and coast

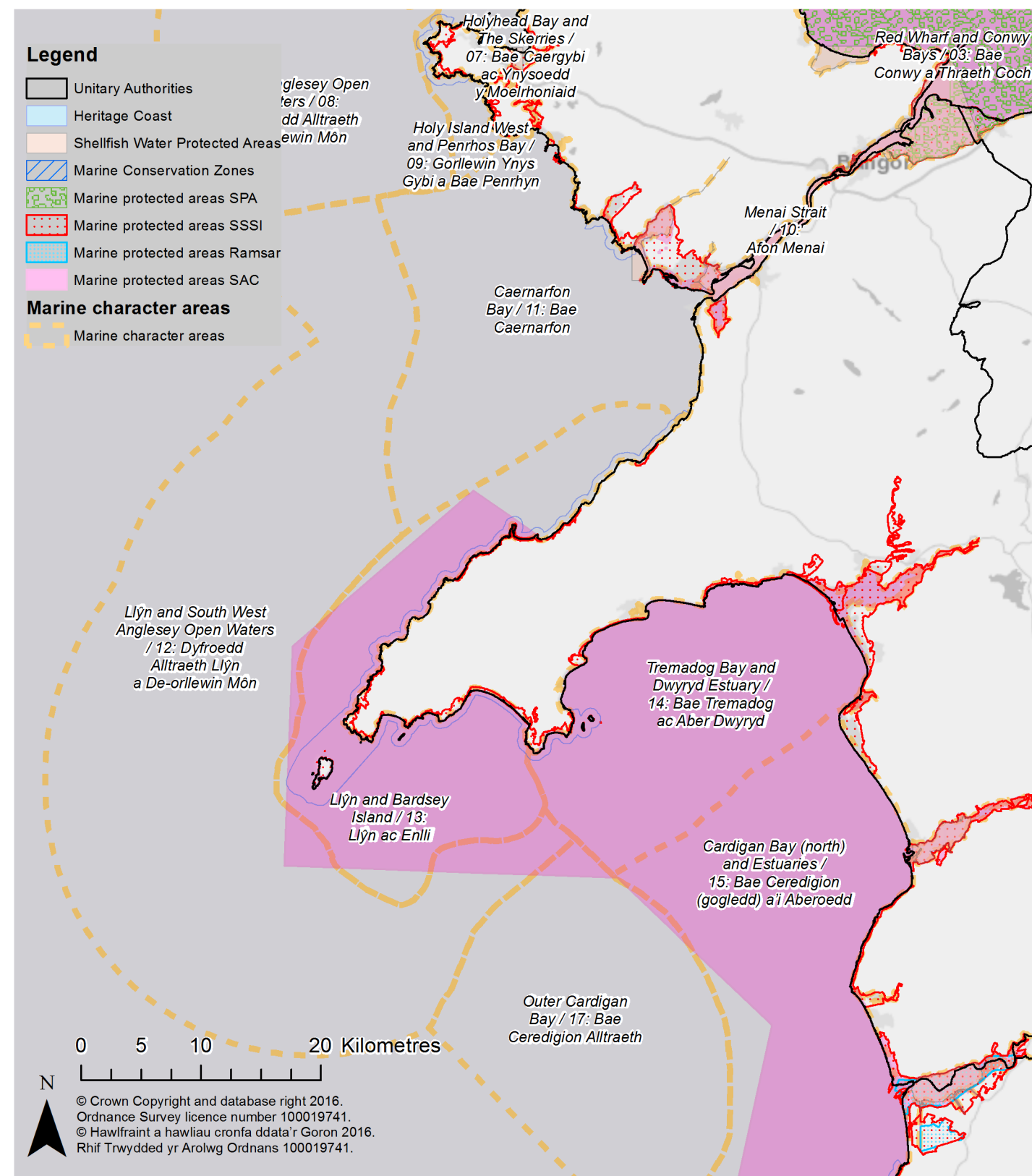
## What does this mean locally?

Gwynedd falls within the five Marine Character Areas (MCA) of: Cardigan Bay (North) MCA, Llyn and Bardsey Island MCA, Caernarfon Bay MCA, Menai Strait MCA, and Red Wharf and Conwy Bays MCA.

The northern part of the Cardigan Bay MCA is dominated by the distinctive sand dunes of Morfa Dyffryn. The mobile sand dune system is of international importance (SAC, SSSI and NNR designated), surrounded by saltmarsh, swamp, vegetated shingle and dune slacks. The area is also internationally important for biogenic reefs extending out from the shoreline – part of the Llyn Peninsula and The Sarnau SAC. Draining into Barmouth Bay, the Mawddach Estuary is designated as SAC and SSSI, with extensive intertidal habitats and grazing marshes supporting important breeding bird populations. The waters support a rich fish and shellfish resource, attracting cetaceans including bottlenose dolphins, with grey seals also frequenting the reefs and sandbanks. Important populations of otters in the estuary systems also underpin the international designation. Basking sharks and leatherback turtles can be spotted in the waters – turtles migrating in the summer from the tropics to feast on barrel jellyfish in Tremadog Bay. The MCA also provides nursery grounds for commercially important demersal fish and feeding grounds for sea birds.

All of the adjacent coastline and islands to the Llyn Peninsular MCA are defined as Heritage Coast, and the vast majority falls within the Llyn AONB. Significant stretches of the coast are at least SSSI-designated on merit of their nationally important geology and nature conservation importance. The majority of the marine and intertidal areas fall within the Llyn Peninsula and the Sarnau SAC. This European site is of primary importance for its breeding population of bottlenose dolphins – the area's shallow bays and sheltered headlands providing important feeding areas for adults and calves. The cliffs in the south-east of the MCA are internationally designated for the vital foraging habitats they provide for the resident populations of chough. Bardsey Island (SSSI, SPA, SAC and NNR) is also of international importance for its breeding seabird colonies.

The whole of the Menai Strait is a designated SAC, representing a wealth and complexity of habitats: one of Wales' jewels in terms of marine biodiversity. These include reefs and submerged sandbanks, tidal mud and sandflats, intertidal rocky shores, rare rocky islands and sessile oak woodland clocking the steep coastal slopes right down to the water's edge. Feeding into the south-west of the SAC is the estuary of the Afon Gwyrfa at Y Foryd (also designated as SSSI and LNR). This site is valued for its ornithological and marine biological features. Ecologically and physically linked to the Menai Strait are the extensive mudflats and sandbanks of Traeth Lafan (SSSI, SPA, SAC) within MCA 3, which are of particular importance for wading birds and wildfowl.



## What does this map mean?

This map shows the designated areas around the coast of the PSB. There are several types of statutory designations both local, national and international. Together they form a network of marine protected areas. These sites are crucial in supporting a healthy and resilient environment in Wales. There are additional designations in some areas that relate to economically significant shellfish species.

Heritage coasts have been established in some areas to conserve, protect and enhance areas of undeveloped coast. Although this is not a statutory designation, it must be considered in local development planning.

## What does this mean for well-being

Marine ecosystems around the coast of Wales are important for well-being. Coasts and seas support well-being in many ways by providing jobs, food, and opportunities for recreation, energy generation, and enjoyment of wildlife, landscape and cultural heritage.

Marine ecosystems help to regulate water and air quality by trapping, assimilating and degrading pollutants. They provide seafood (fish and shellfish) and support associated coastal communities and food processing industries.

The Welsh Coast is vital to the tourism industry in Wales. In 2006, spending associated with an overnight visit to the coast amounted to around £648million, nearly 40% of total tourism spending in Wales<sup>a</sup>.

<http://gov.wales/docs/drah/publications/Tourism/090612coastaleng.pdf>

# Further information

Information can be found from the Joint Nature Conservation Committee (<http://jncc.defra.gov.uk/>)

Special Areas of Conservation (SACs) are designated under the EC Habitats Directive for habitats and species listed in Annex I and II of the Directive. SACs with marine components are sites that contain qualifying marine habitats or species. There are currently 99 SACs with marine components that cover about 7.6% of the UK's marine area.

One key objective of the Birds Directive is to establish a European co-ordinated network of protected areas. The suite of SPAs on land in the UK is well established. The Birds Directive states that conservation measures should be taken both in “the geographical sea and land area”. At the moment there are 102 SPAs which include marine components in the UK including four wholly marine SPAs in English, Northern Irish and Welsh waters, and 35 seabird colony SPA marine extensions across the UK.

The Marine and Coastal Access Act 2009 allows for the creation of Marine Conservation Zones (MCZs). MCZs protect a range of nationally important marine wildlife, habitats, geology and geomorphology, and can be designated anywhere in English and Welsh territorial and UK offshore waters.

The SSSI/ASSI series has developed since 1949 as the suite of sites providing statutory protection for the best examples of the UK's flora, fauna, or geological or physiographical features. These sites are also used to underpin other national and international nature conservation designations. Most SSSIs are privately-owned or managed; others are owned or managed by public bodies or non-government organisations.

Heritage coasts are ‘defined’ rather than designated, so there isn’t a statutory designation process like that associated with national parks and areas of outstanding natural beauty (AONB).

They were established to conserve the best stretches of undeveloped coast in Wales. A heritage coast is defined by agreement between the relevant maritime local authorities and Natural Resources Wales.

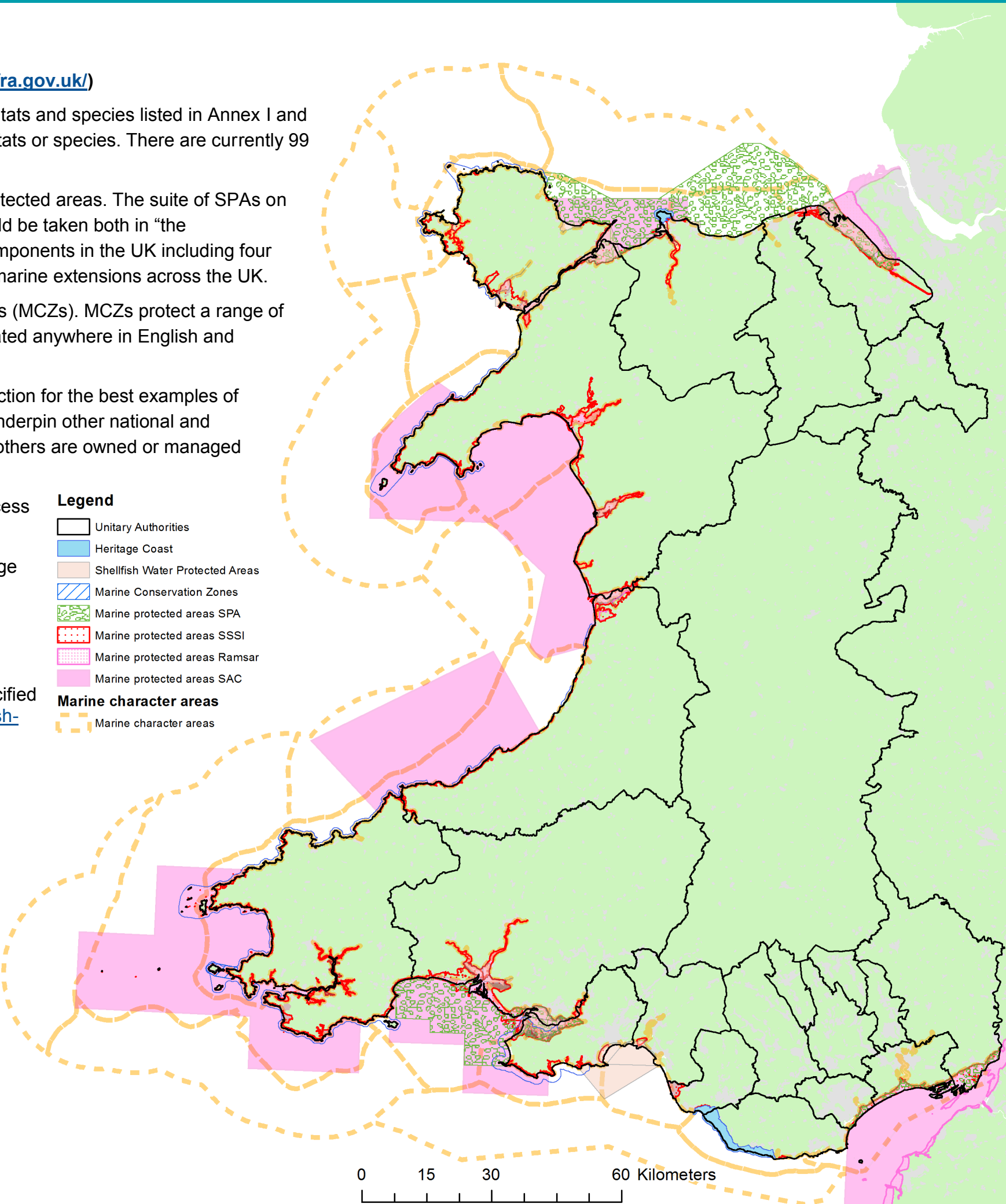
The Water Framework Directive requires specification of protected areas for those areas designated for the protection of economically significant species. This list are those protected areas previously designated under the repealed Shellfish Waters Directive which are now specified under the Water Framework Directive. From <http://naturalresources.wales/water/quality/shellfish-water-protected-areas/?lang=en>

For further detailed information see the [Snowdonia Seascape Assessment](#).

[https://www.naturalresources.wales/media/674493/mca-15-cardigan-bay-north-and-estuaries\\_final.pdf](https://www.naturalresources.wales/media/674493/mca-15-cardigan-bay-north-and-estuaries_final.pdf)

<http://www.eryri-npa.gov.uk/planning/planning-policy/Supp-Planning-Guidance>

Dataset
Heritage coast
Shellfish protected areas
Marine Conservation Zone (MCZ)
Marine Character Areas





# Forests, woods and trees

## What does this mean locally?

Woodlands cover 14.9% of the county which is slightly above the Wales average of 14%. The county is characterised by the Meirionnydd oak woodlands – particularly in the Vale of Ffestiniog small blocks of farm woodland, rural estates and larger upland forest blocks, such as Beddgelert, Hafod Fawr, the Dyfi forest and Coed Y Brenin. Coed Y Brenin is a major tourist recreation destination and contains nationally renowned mountain bike trails as well as trail running and walking routes. Dyfi forest is also important for recreation and hosts motorsports events.

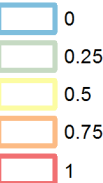
Meirionnydd Oakwoods – a remnant of oakwoods that once covered much of the coasts of Europe comprises eight SSSI woodlands - three of which (Coed Llyn Mair, Ceunant Cynfal and Ceunant Llennyrch) are well developed for visitors with walking trails etc. The others are Coed Cymerau, Coed Tremadog, Coed Ganllwyd, Coed Camlyn and Coed y Rhygen. These woodlands are important for a range of wildlife but particularly ferns, lichens and mosses and are also particularly important for bats.

Issues include: problems establishing new broadleaved woods due to grey squirrel damage; lack of available land for planting; little economic incentive to plant and manage woodlands; low contractor base; some tree disease; and the need to diversify tree species and management in our conifer woodlands.

### Legend

Unitary Authorities

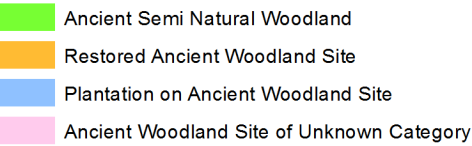
### Tree cover in urban areas (quintile)



Urban Tree Canopy Cover (2009)

Woods For People

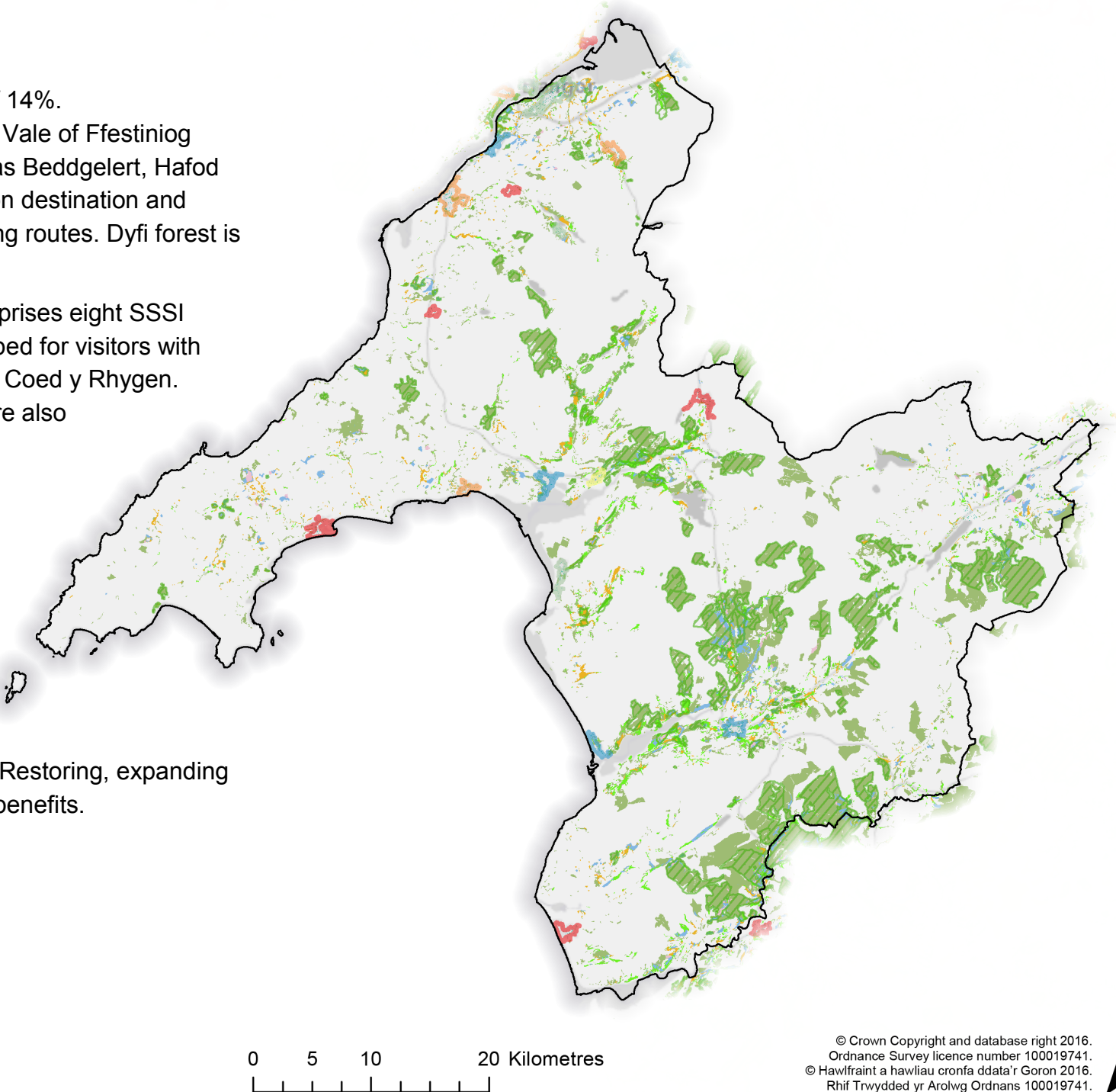
### Ancient woodland inventory 2011



### National Forest Inventory Wales (2013)

Woodland

Woodlands and forests provide employment through timber harvesting and recreation; are an important part of the landscape and contribute to tourism; help absorb and store carbon dioxide thereby helping fighting climate change; provide habitat for wildlife and prevent sedimentation and erosion. Restoring, expanding and improving the condition of our woods is key to realising these benefits.



## What does this map mean?

The maps shows the extent of woodland in Wales; the ancient woodland resource (the most important woodland for biodiversity); and our urban trees.

Woodland in Wales’ covers 306,000 hectares, with approximately half being conifer and half broadleaved. Wales is one of the least wooded countries in Europe (14.8% of land area compared to the EU average of 38%). Forestry based industries are worth over £400 million per annum to the Welsh economy, however, we still import 63% of softwood and 94% of the hardwood timber. Forecasts of future timber production in Wales’ shows a drop in availability from current levels if we do not bring more areas into production and/or increase our woodland cover.

Trees in urban areas have an average of 16.4% canopy cover (2013) (covering 14,145 ha) which is mid-range in world rankings. One hundred and sixty out of our 220 towns (73%) showed an overall decline in tree canopy cover between 2009 and 2013. Of particular concern is the loss between 2006 and 2013 of 7,000 large urban trees that are valued by communities. Tree cover in deprived areas tends to be lower and relatively less diverse in urban trees.

## What does this mean for well-being

Woodlands and trees provide a variety of benefits to well-being. They help regulate our climate, provide income & jobs from timber and other activities, store carbon; contribute to reducing flood and low river flow risk; safeguard soils; improve air quality; reduce noise; and regulate pests and diseases. They play a major role in pollination, soil formation, nutrient cycling, water cycling and oxygen production, all of which are crucial in supporting well-being. Trees also contribute to improving our health. Studies have

shown that there are significant positive associations between mental and physical well-being and increased trees and greenspace in urban areas. Children living in areas with more street trees, for example, have lower prevalence of asthma<sup>1</sup>. The effectiveness of woodland & trees in providing the above ‘services’ are dependent on its location, extent, condition and resilience. Therefore, if we want to realise the benefits that woodland & trees provide – we need to: create more new woodlands which can both produce timber and deliver community and biodiversity benefits; bring more woodlands into active management; use more locally produced wood products in construction and in our homes – this will help drive demand and increase woodland management; get people out into the woods to enjoy them.

# Further information

## Urban trees

Trees are among the most versatile and cost-effective natural assets that planners, policy makers, businesses and communities can use to raise the quality of Welsh towns and cities.

## Benefits for all

Trees are an essential element of our urban ecosystems, [delivering a wide range of services](#) to help sustain life, promote well-being and support economic benefits.

We see them all around us, on public and private land, along streets, roads and rivers. We see them in civic, retail and business areas, in parks, cemeteries, schools and in residential gardens. There are even urban woodlands.

## Woodlands for Wales

In [Woodlands for Wales](#), the Welsh Government states its aim to ensure that trees and woodlands play a greater and more valued role in towns and cities. This will improve the quality of life and surroundings for people who live in urban areas.

Natural Resources Wales is committed to working with colleagues in the Welsh Government and in public, third sector organisations throughout Wales to support and promote a strategic approach to managing our urban trees.

## Tree cover in Wales’ towns and cities

This Natural Resources Wales study helps us all to understand more about the tree cover in our communities so that we can better plan and manage this amazing resource.

This is the first time a country has ever recorded all of its urban canopy cover.

Discover where tree cover is at its highest and lowest across Wales’s towns and cities. See how the character of the landscape, more or less well-off neighbourhoods and land-use all influence the extent of canopy cover.

Read the full report: [Tree cover in Wales’ towns and cities](#)

The [summary report](#) is also available in hard copy. To find out more, contact [urbantrees@naturalresourceswales.gov.uk](mailto:urbantrees@naturalresourceswales.gov.uk).

For further information on urban trees visit the Natural Resources Wales website (<https://naturalresources.wales/people-and-communities/green-spaces/urban-trees/>). The content of this page is derived from this webpage.

<sup>1</sup> Journal of Epidemiology and Community Health 62(7): pp647-9. Lovasi GS, Quinn JW, Neckerman KM, Perzanowski MS, Rundle A (2007)

Dataset	Comments
National forest inventory	
Urban tree cover 2009	
Ancient woodland inventory	
Urban tree cover (quintile)	The urban tree cover quintile ranks urban areas in Wales relative to each other by their urban tree cover



# Our greenspaces

**What does this mean locally?** There appears to be a lack of promotion of green spaces with large open areas not being available as greenspaces.

Reducing resources affects priorities and often Local Nature Reserves (LNR's) and upgrading and managing community greenspaces struggle to compete, which can mean less support for community engagement. There are areas of deprivation around urban areas - some rural villages are also affected. Remote areas and poor urban planning of access routes to recreational amenity in terms of green space is also an issue as is poor knowledge of paths/sites in local areas. There is a risk of a fall in the number and quality of local greenspaces and therefore a decline in use due to littering, anti - social behaviour and a lack of community support. NRW fund the Lonydd glas project, we manage the funding and steer the work programme for the Wales Coast Path. We also manage NNR's (National Nature Reserves), open access land, forestry areas, Llyn Coastal bus pilot project, AONB (Area of Outstanding National Beauty) Programme, Pen Llyn SAC (Special Area of Conservation) project and more.

**Legend**

Gwynedd - Gwynedd

**Accessible Natural Greenspaces - Map 5.1**

**Naturalness, Accessible**

- T, Full
- T, Conditional
- T, Proximate and Remote
- T, No Access
- T, Potential Sites
- F, Some Access
- F, No Access
- F, Potential Not Verified

**(Inset)**

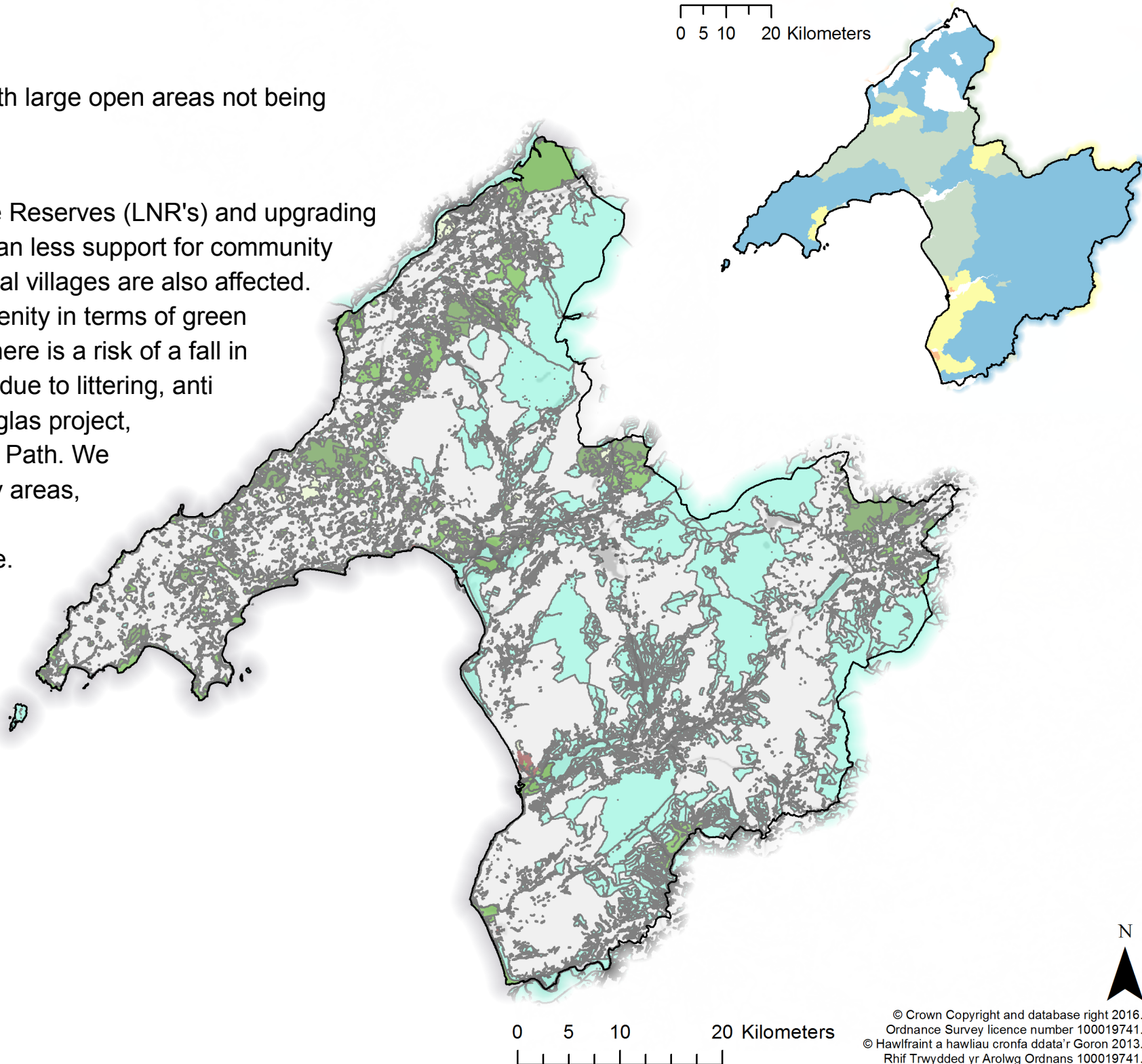
**Mental wellbeing - Wales**

**Mental Health Score Quintile**

- 0
- 0.25
- 0.5
- 0.75
- 1

\*Mental health quintiles for rural areas, as opposed to an all Wales

0 5 10 20 Kilometers



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Rhif Trwydded yr Arolwg Ordnans 100019741.

**What does this map mean?**

The maps show the areas of accessible natural greenspace in Wales. Greenspace and trees can make a significant contribution to the physical and mental health and well-being of the population in Wales. Increasing levels of physical activity has beneficial consequences in terms of increasing peoples' healthy lifespans and reducing the incidence of chronic disease, including cardiovascular disease, some cancers, type II diabetes and osteoporosis. Even in our 'green' country, not everyone has access to the green space required to maintain physical health and mental well-being. Path networks, urban woodlands and other green infrastructure aimed at enhancing the quality and accessibility of the local environment can all play an important role in improving the health and well-being of people in Wales. But these are not always located near to the people that would benefit from them most, or are not managed in ways which make them accessible and attractive to use.

**What does this mean for well-being**

The cost of physical inactivity to Wales is estimated to be £650 million per year<sup>1</sup>. However, it's widely recognised that several of the key health issues faced by Wales (and other countries) are considered to be 'preventable' (Chief Medical Officer Annual Report 2013-14 & 2014-15). These include many of the chronic conditions that insufficient physical activity contributes to such as cardiovascular disease, Type 2 diabetes, chronic kidney disease, some cancers, osteoporosis and arthritis.

Use of the natural environment can support social resilience by providing opportunities for interaction and engagement. This helps build social cohesion, along with improving mental well-being and increased physical activity, both of which are of particular benefit in more deprived areas, where social resilience is often at a lower level.

<sup>1</sup> Climbing higher: creating an active Wales by the Welsh Government 2009

## Further information

Well planned and managed greenspace (including rivers and canals) offer a wide range of benefits for wellbeing, including air and water purification, carbon sequestration, noise alleviation and surface water regulation. Physical changes, such as converting gardens to driveways, can reduce vegetation and permeable surfaces and increase surface water run-off which in turn puts added stress on sewer and drainage networks, especially in times of heavy rainfall. Whilst the information in this maps is specifically focussed on access the multiple functions of greenspace should not be ignored.

The James Hutton Institute found:

- There was no evidence of a relationship between the amount of green space in urban neighbourhoods and mortality and various measures of morbidity. The exception is men living in deprived urban areas where higher amounts of local green space were associated with a lower risk of mortality (GreenHealth Briefing 1).
- For those who did use green spaces for physical activity, no relationship was found between obesity and self-reported cardiovascular or respiratory health. However, levels of c-reactive protein (a marker of inflammatory response in the body) were lower in men living in urban areas who regularly used green space for physical activity than those who did not (GreenHealth Briefing 1).
- There was no relationship between the amount of green space in urban neighbourhoods and mental health and wellbeing. However, urban dwellers who used green space such as woods and forests for physical activity had a lower risk of poor mental health than non-users of these types of green spaces. Regular use of woods and forests appeared to be more protective of mental health than exercising in the gym or streets (GreenHealth Briefing 1).
- In three deprived urban areas in Edinburgh and Dundee (total sample 300), analysis of self-perceived stress levels were found to be associated with the amount of green space within deprived urban neighbourhoods. However, the strength and direction of relationships varied by gender (GreenHealth Briefing 2).
- In the deprived urban communities, more green space was associated with lower levels of stress as evidenced by salivary cortisol patterns for a sample of middle-aged men and women not in work. More green space has a greater effect on cortisol concentrations in women than in men in these groups (GreenHealth Briefing 3).
- Individuals and social groups attach different meanings to green space, and experience differing wellbeing benefits. For most people social interaction is significant in using local green space (GreenHealth Briefing 4).
- Larger urban green spaces provide multiple functions for communities of place, and communities of interest; smaller areas of green space provide important spaces for short periods outdoors. There is significant community interest in involvement in decision-making about local green spaces (GreenHealth Briefing 5).
- Ensuring the visibility of green space can make a significant difference to the interpretation of accessibility (GreenHealth Briefing 6).

See <http://www.hutton.ac.uk/research/projects/green-health> for more information.

Dataset
Accessible Natural Greenspace
WIMD mental well-being



# Recreation, access and tourism

## What does this mean locally?

Over 25% of Wales is designated as National Parks and Areas of Outstanding Natural Beauty, with iconic landscapes providing a clear sense of place and cultural identity. Wales has a wealth of opportunities for people to enjoy the outdoors. There are thousands of kilometres of public paths, some of these are part of the flagship National Trails or the award-winning Wales Coast Path. Over a fifth of Wales also has ‘open access’ where you can walk anywhere, this includes 100,000 hectares of Welsh Government woodland that NRW manages.

There are also many other places people can visit including Local Nature Reserves, country parks and most National Nature Reserves. Horse riding is allowed in some NRW managed woodland. There are cycle routes across Wales allowing active travel and more technical mountain bike routes in some woodland. Enjoyment of the outdoors is also an important part of appreciating the cultural and landscape heritage of Wales and people’s place within it.

In Gwynedd there are 3,690 kilometres of public rights of way, most of which are public footpaths. 290 kilometres of this total is part of the Wales Coast Path.

Additionally there is 105,029 hectares of access land (where people can walk anywhere, instead of having to keep to linear paths), 14,234 hectares of this is NRW managed woodland. 41% of Gwynedd’s area is access land. There is high pressure on many of Gwynedd’s natural assets, including Coed y Brenin, Padarn Lake and Coedydd Aber National Nature Reserve.

**Legend**

Unitary Authorities

**Tourist locations**

**LEGEND**

★

Country Park

Cycle route (Sustrans)

Wales coast path

National Parks

Historic Landscapes

Local Nature Reserve (LNR)

National Nature Reserves (NNR)

Areas of Outstanding Natural Beauty

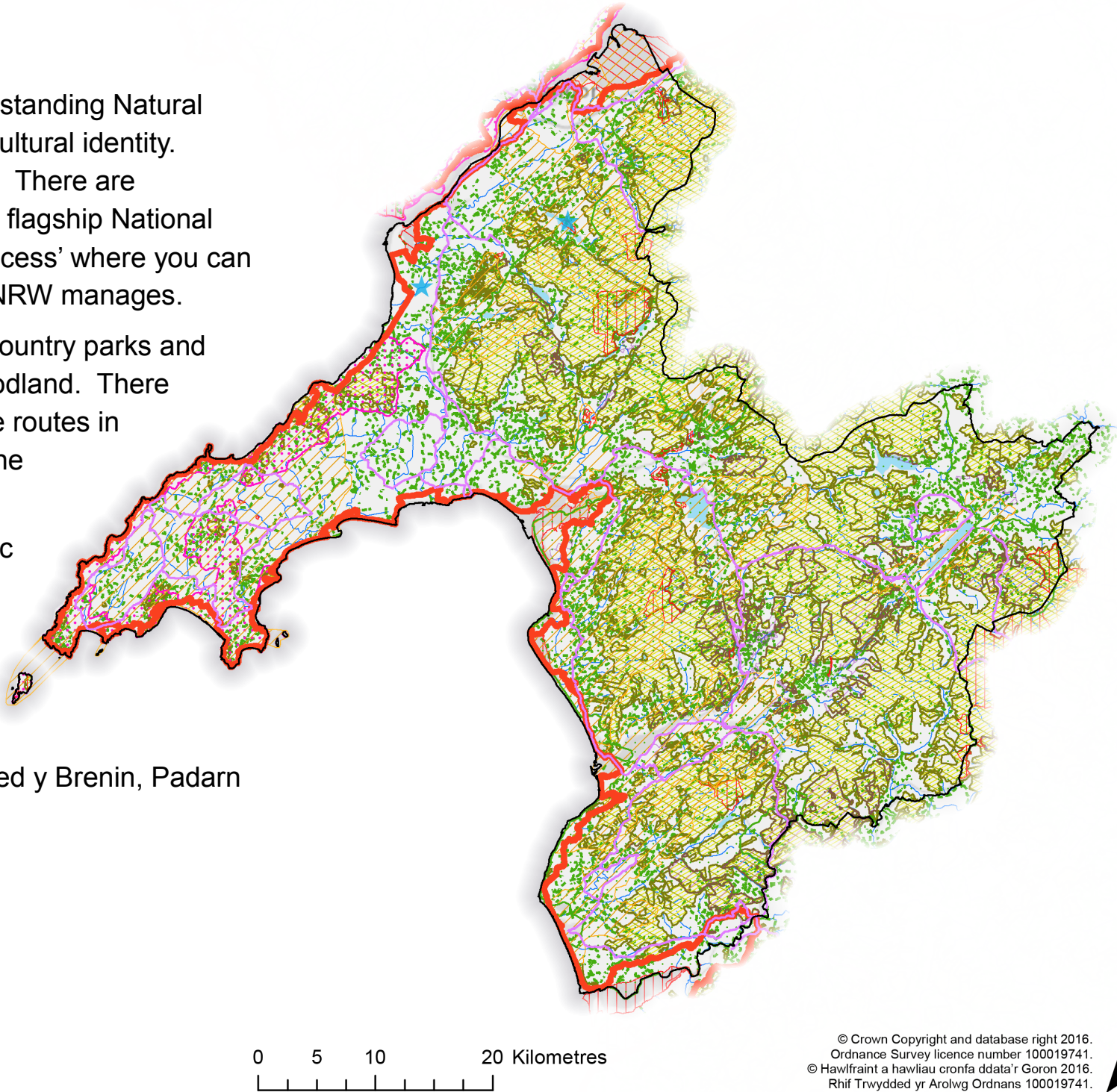
Horse Riding Access Woodland

Open Access Land

Public Right of Way (PRoW)

Lakes

Rivers



## What does this mean for well-being

Outdoor recreation can make a significant contribution to the physical health and mental well-being of the population in Wales: increasing levels of physical activity has beneficial consequences in terms of increasing peoples’ healthy lifespans and reducing the incidence of chronic disease, including cardiovascular disease, some cancers, type II diabetes and osteoporosis. Many outdoor recreational activities are free at the point of use, enabling participation across and between communities. The outdoors can offer opportunities for everyone; and appropriate promotion, facilities and access opportunities can improve social inclusion. Equitable access to the countryside, water and green space close to where people live is increasingly important, providing health, economic and social benefits for communities and businesses.

Walking and cycling can play a key role in serving local transport needs and helping address the issues of congestion, pollution and climate change associated with car dependency. What are sometimes classed as ‘everyday journeys’ to work by foot or bike cost less and help to keep people fit as well as being enjoyable. This type of journey is sometimes known as ‘active travel’.

## Further information

There is currently a Rights Of Way Improvement Plan for every local authority area. Local Authorities are required to review them within 10 years of publication of the first plan – this is due to start within the next two y ears.

<http://naturalresources.wales/out-and-about/recreation-and-access-policy-advice-and-guidance/grants-and-projects/rights-of-way-improvement-plans-and-funding/?lang=en>

### Rights of Way Improvement Plans and Funding

Paths and routes are being improved across the whole of Wales as local authorities implement their Rights of Way Improvement Plans, with funding and help from the Welsh Government and Natural Resources Wales.

### What are Rights of Way Improvement Plans?

The Countryside and Rights of Way Act places 2000 placed a duty on each Highway Authority in England and Wales to publish a Rights of Way Improvement Plan (RoWIP).

### 10-year prioritised plans

These are 10-year prioritised plans for the improvement of the local rights of way network and are intended to benefit all users – walkers, cyclists, horse riders and off-road users, as well as people with sight and mobility problems. The plans set out the principle means by which local highway authorities are to identify, prioritise and plan for improvements to their local rights of way network.

Dataset	Strategic context and assessments
Cycle route (Sustrans)	RoWIPs should have distinct sections setting out the strategic context and assessment of an authority’s local rights of way. These sections will lead into a Statement of Action for the management and improvement of local rights of way.
Wales Coast Path	
Natioonal Parks	<b>Local authorities’ RoWIPs</b>  All local authorities in Wales together with Brecon Beacons National Park Authority have a Rights of Way Improvement Plan for their area. There are 23 plans in total. Natural Resources Wales has worked to support local authorities with their improvement plans and will be a statutory consultee for future plans. Local highway authorities are required to review their RoWIPs within 10 years of the date of publication of their previous plan.
Historic Landscape	
Area of Outstanding Natural Beauty (AONB)	<b>RoWIP Review</b>  Beginning in May 2015, NRW undertook work to develop advice on the statutory Review of RoWIPs in Wales. The process to develop the advice included consultation with a range of interested stakeholders and was overseen by a working group that comprised NRW, local authority/national park and Welsh Government staff. The advice, submitted to Welsh Government took the form of Draft Guidance.
Woods for People	
Open access land (2014)	
Public rights of way	
Rivers and lakes	
Places of interest	



# Soils and agriculture

## What does this mean locally?

Gwynedd supports the widest range of peatland habitats in Wales. The extensive blanket bogs include Migneint south to Penaran, the N flanks of Berwyn and localised areas on Rhinog, Eryri and Cadair Idris . The diverse lowland peatlands include raised bogs, blanket bog and acid fens; the Llŷn rich-fens are second only to Anglesey in terms of Welsh importance. Extensive areas of heavily modified peat occur on the Cardigan Bay coast.

Neglect or inappropriate management are key issues for lowland sites, together with enrichment and drainage. Upland peatlands remain affected by drainage, afforestation, nitrogen deposition and grazing. Loss/damage from agricultural improvement remains a threat, particularly on Llŷn.

Many lowland sites lie within intensively farmed landscapes. Insufficient resources/mechanisms limit the areas subject to favourable management, especially non-statutory sites on Llyn/Eifionydd. Drainage remains an issue for blanket bog, together with over/under-grazing. Conifer plantations reflect the past policy of planting peat.

The extent and diversity of the Gwynedd peatland resource is of national significance; intervention is needed at many sites to sustain/improve biodiversity, carbon storage/sequestration, flood risk mitigation. Projects are needed to complete ditch blocking and address grazing issues for blanket peat. Engaging communities in the management of Llŷn’s overlooked peat resource is needed. Coastal peatlands such as Arthog provide significant opportunities for integrating peatland restoration with flood risk mitigation.

NRW, SNPA and NT are engaged in peat restoration: SNPA has produced a Peatland Strategy. There are considerable opportunities for habitat restoration at several sites, such as Arthog Bog and considerable opportunity for coastal realignment in Meirionnydd and the Conwy Bay area. Historic engineering, land drainage and reclamation schemes continue to constrain ecosystem functioning in many areas causing loss of habitat and carbon stores.

The Anglesey & Llyn Fens LIFE+ project, now ended, delivered peatland restoration at Cors Geirch NNR. The Pearls in Peril LIFE+ project delivered wetland restoration in the Bronaber area which will reverse peat loss. NRW and the National Park Authority are working together to restore bogs.

Legend

Unitary Authorities

**Total Peatland**

**SOIL\_TYPE**

Deep peaty soil

Modified deep peaty soil

Shallow peaty soil

Soil with peaty pockets

**Agricultural Land Classification**

**CLASS**

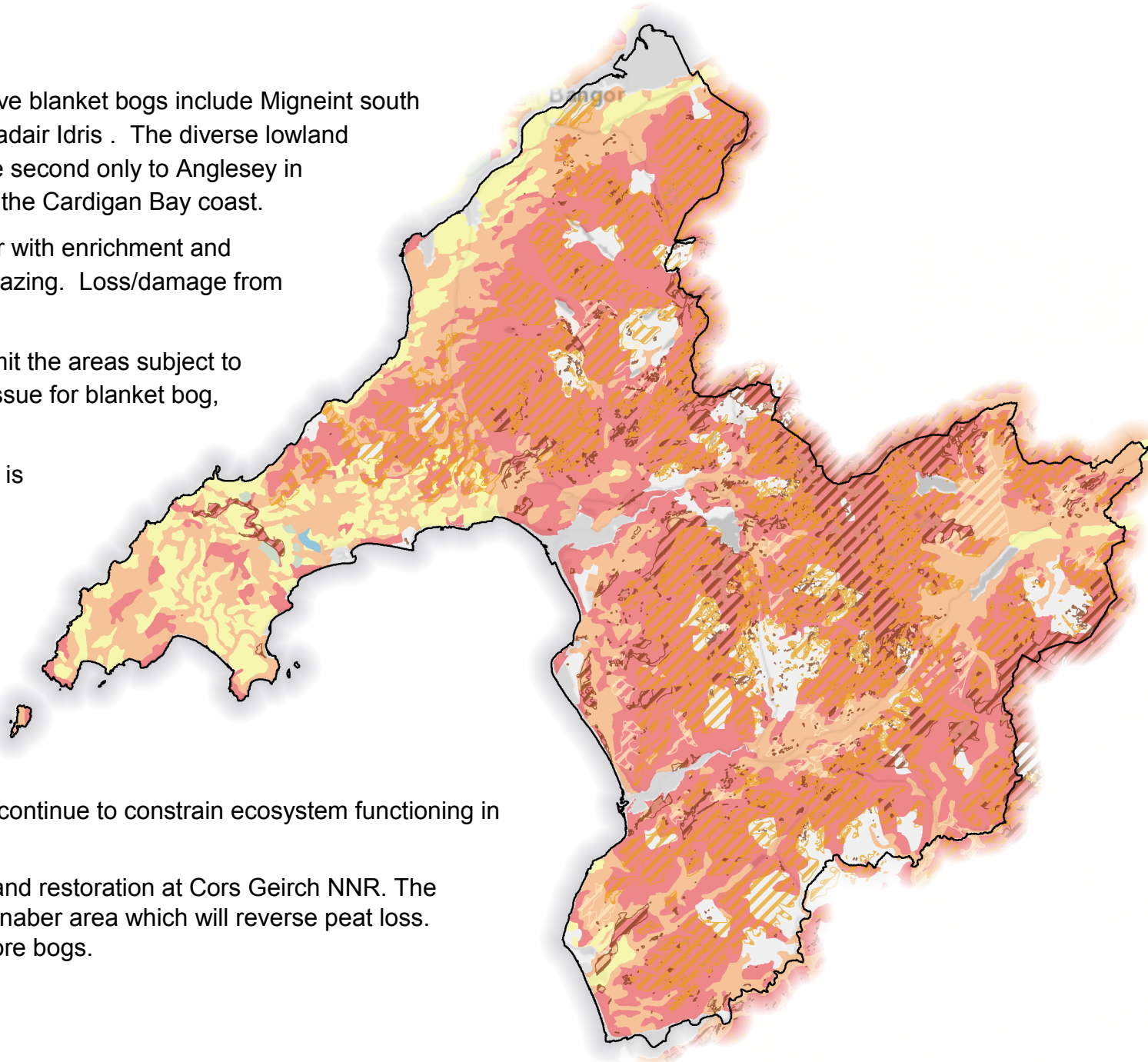
Grade 1

Grade 2

Grade 3

Grade 4

Grade 5



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## What does this map mean?

This map highlights all the extent of deep peat within this PSB area. Semi-natural peatland vegetation in good condition delivers the widest range of ecosystem services. Restoring all areas of peatland in Wales with semi-natural vegetation is a Welsh Government priority and so these are a priority for joint action wherever they occur.

Deep peat soils (peat soils over 50cm deep) occur throughout Wales and are one of our critical natural assets. Peat supports the largest amount of soil carbon per unit area of any soils and when in good condition in mires (wetlands) play a very important role in climate change by locking up carbon from the atmosphere.

The characteristic habitats, plant and animal species associated with peatlands are a key feature of Wales’s biodiversity and all public bodies have a duty to enhance and maintain them. Peatlands in good condition help sustain rivers and streams during dry periods; help retain or slow-down runoff and in doing so form part of our range of natural flood risk management assets. Peatlands contribute to the character and landscape quality of Wales, providing wild, but accessible places for people and nature.

## What does this mean for well-being

Peatland habitats help regulate our climate and the water cycle, both of which are fundamental to wellbeing. Deep peat soils are important for mitigating climate change as they take up and store atmospheric carbon.

Peatland habitats can play an important role in water management, slowing down flood waters and naturally reducing flood-risk downstream. By slowly releasing water during dry periods, peatland helps to reduce the impact of droughts on water supplies and on river and stream flows.

Peat in good condition supports clean, well-functioning river systems underpinning good environmental quality. They also provide wild, but accessible space for recreation and are integral parts of the landscape across Wales.

# NRW land ownership and management

**What does this mean?** This map shows areas of land owned or managed by NRW. NRW directly manages 7% of the land area of Wales – much of it near to where people live and work. This includes 120,000ha of woodland which equates to an area half the size of Carmarthenshire.

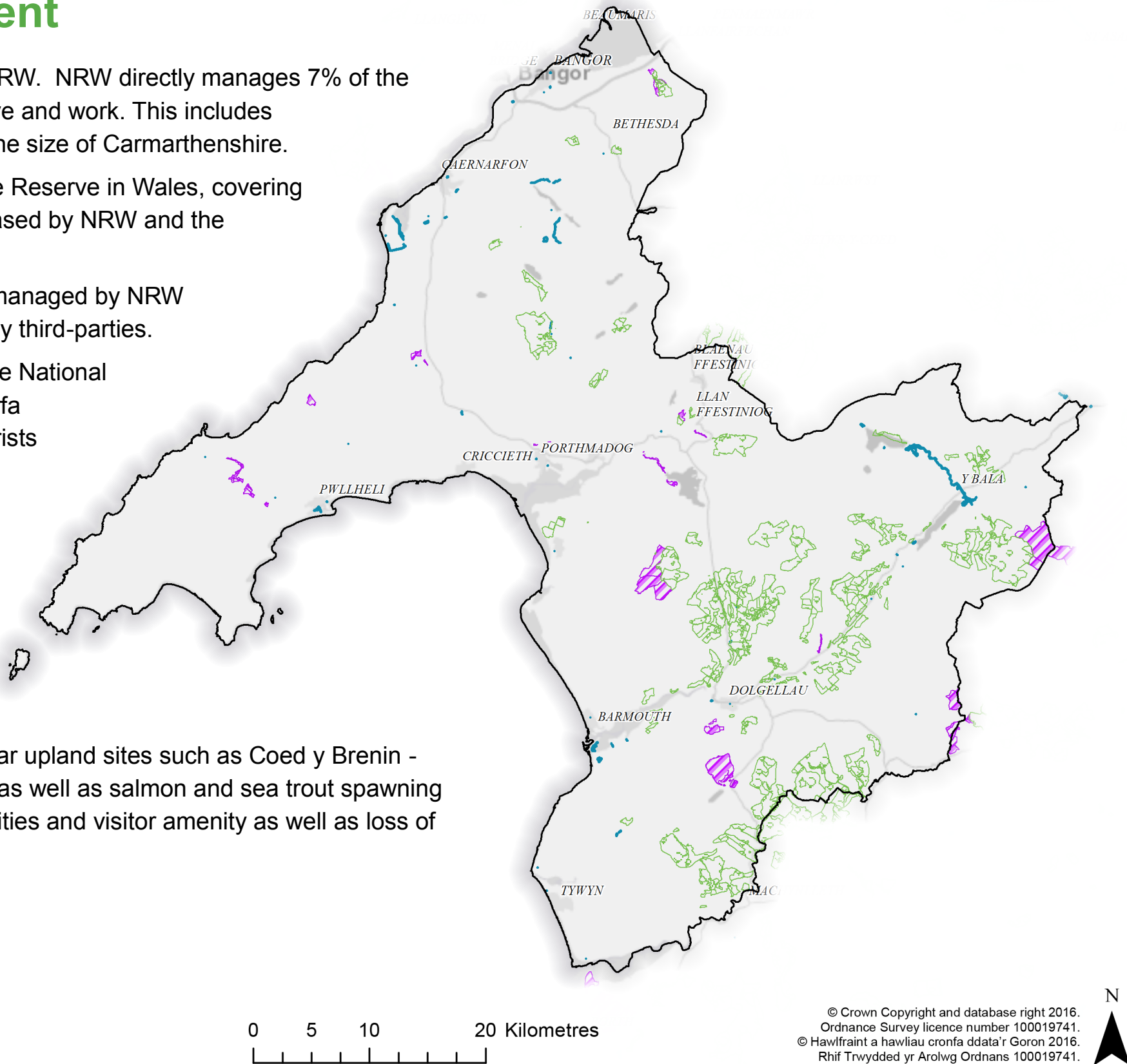
There are currently 76 National Nature Reserves and one Marine Nature Reserve in Wales, covering a total land area of just over 26,000 ha. 16,500 ha of this is owned or leased by NRW and the remaining 9,500 ha is managed through agreements with land owners.

41 of these 76 Nature Reserves are managed entirely by NRW, 17 are managed by NRW through partnerships e.g. with the National Trust, and 18 are managed by third-parties.

NRW own and manage substantial areas of land in Gwynedd such as the National Nature Reserves (NNR) at Abergwyngregyn Valley, Cadair Idris and Morfa Harlech. These are very popular and important areas for locals and tourists alike.

Forests such as Coed Y Brenin are a big part of the local economy but these need to be carefully managed to reduce self-seeding conifers on neighbouring habitats eg. blanket bog and heathland on Sites of Special Scientific Interest (SSSI) & Special Areas of Conservation (SACs). Liaison with NRW colleagues is important to design plantations to reduce seeding impact. Glastir & NRW Management agreements can aid in removing invasive conifers.

Gold panning and visitor pressure are an issue at some sites (in particular upland sites such as Coed y Brenin - Afon Mawddach & Afon Wen), resulting in damage to river bed & banks as well as salmon and sea trout spawning beds. These issues also result in disruption to National Park scenic qualities and visitor amenity as well as loss of



- Legend**
- Unitary Authorities
  - NRW managed woodland
  - NRW nature reserve
  - NRW waterways and flood defence

**What does this mean for well-being?** Well managed land plays in important role in meeting human needs while ensuring the long-term health of ecosystems and the economy. Managing land areas in new and different ways can deliver a range of environmental and wellbeing benefits for local communities and for Wales including reducing flood risk, improving recreation opportunities and improving air quality. NRW enables access to the woodlands and reserves it manages. Improving access to land has great potential for improving health and well-being, tackling social inequity and poverty and providing opportunities for enterprise activities.



# Appendix 1: Air Quality

## Why is air quality important

Air Quality is the leading cause of the environmental burden of disease in Europe. In February 2016 it was reported that 40,000 additional deaths per year are attributable to poor air quality<sup>1</sup>, with a health cost of £20 billion per annum.

## Who does what in Wales?

Natural Resources Wales regulates emissions to air from larger industrial operations (Part A1 under the Environmental Permitting Regulations (EPR)), such as power stations, refineries and incinerators, to meet the requirements of the Industrial Emissions Directive 2010. Inherent in this is the need to prevent, or minimise, emissions from the sites we regulate by applying the national and European standards set to protect health and the environment. We are also required to produce an annual Pollution Inventory for emissions. Under the Environment (Wales) Act 2016 NRW also has a duty to report on the state of air quality in Wales as part of the State of Natural Resources Report (SoNaRR) and to consider more local environmental priorities in Area Statements.

Welsh Government is the competent authority, under the Air Quality Standards (Wales) Regulations 2010, for implementing the requirements of the 2008 directive on ambient air quality and Cleaner Air for Europe (CAFÉ).

Under the Environment Act 1995 Local Authorities have responsibility for the assessment and management of local air quality, designating Air Quality Management Areas and implementing action plans where there is a failure to meet the required standards. Local Authorities also regulate emissions to air from smaller industries (Part A2 and B under EPR).

## Current State

Air quality in Wales has improved, with statutory emissions controls and a decreasing industrial base leading to a reduction in industrial emissions<sup>2</sup>. However ambient air quality targets for nitrogen dioxide, particulate matter, nickel and polycyclic aromatic hydrocarbons are still being breached in Wales<sup>3</sup>. Although industry remains a significant source of pollutants other sources, generally smaller or more diffuse and subject to less or no regulation, have now become more prominent<sup>2</sup>.

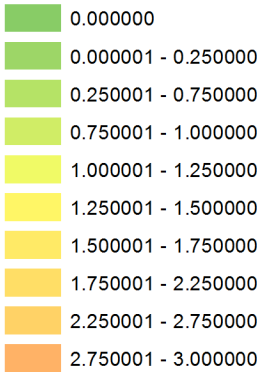
More information on the state of air quality in Wales is available SoNaRR, available from <http://naturalresources.wales/our-evidence-and-reports/the-state-of-natural-resources-report-assessment-of-the-sustainable-management-of-natural-resources/?lang=en>

### Legend

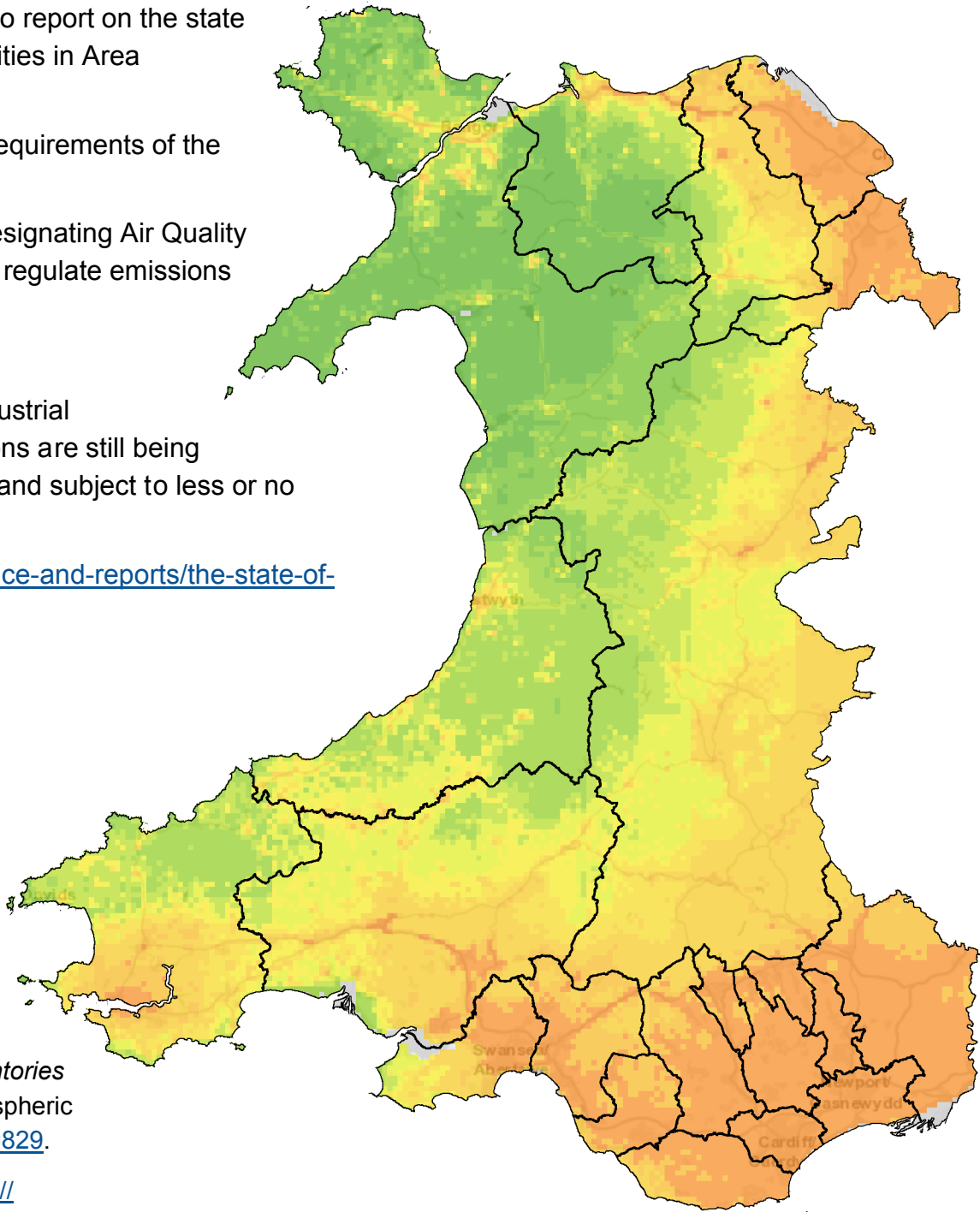
Unitary Authorities

Combined Pollution - NO2, PM2.5 and PM10 (2011)

Combined NO2, PM2.5 and PM10 Pollution Scores



1. Royal College of Physicians. 2016. *Every breath we take: the lifelong impact of air pollution* [online]. London: Royal College of Physicians. Available from: <https://www.rcplondon.ac.uk/projects/outputs/every-breath-we-take-lifelong-impact-air-pollution>
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# Appendix 2: State of Natural Resources Report

The State of Natural Resources Report (SoNaRR; [www.naturalresources.wales/sonarr](http://www.naturalresources.wales/sonarr)) looks at how pressures on Wales’ natural resources are resulting in risks and threats to long-term social, cultural, environmental and economic well-being, as set out in the Well-Being of Future Generations (Wales) Act 2015. It looks at the key issues, as well as opportunities for integrated solutions that provide multiple benefits. SoNaRR considers issues on a Wales-wide scale and should be referred to for further information.

## Economic, social and cultural benefits of our natural resources

Wales’ natural resources provide us with many economic, social and cultural benefits.

For example:

- £385 million from agriculture to the Welsh economy every year.
- 951 million litres of drinking water per day.
- 1.5 million tonnes of green timber a year, making construction easier and cheaper.
- £499.3 million from woodlands each year.
- 14 million tonnes of aggregates per year, for construction and other uses.
- 8,919 gigawatt hours of energy from renewable sources, and rising, creating a renewable energy industry that employs 2,000 people.
- 410 million tonnes of carbon stored in soil to soak up emissions and protect against climate change.
- £2,870 million in tourism to Wales.
- 25% of adults meeting the recommended level of physical activity through outdoor pursuits.
- £18.2 million in health benefits to people from walking the Wales Coast Path.
- £840 million and 30,000 jobs from the historic environment sector.

## What are the key risks and impacts of climate change?

Under the Climate Change Act 2008, the UK Government is required to publish a Climate Change Risk Assessment (CCRA) covering the UK every five years. Using the climate projections to 2080, the report for Wales21 identified the following key **risks**:

- Changes in soil conditions, biodiversity and landscape due to warmer, drier summers
- Reductions in river flows and water availability during the summer, affecting water supplies and the natural environment
- Increases in flooding on the coast and inland, affecting people, property and infrastructure
- Changes in coastal evolution including erosion and coastal squeeze, affecting beaches, intertidal areas and other coastal features
- Changes in species including a decline in native species, changes in migration patterns and increases in invasive species
- Increases in the risk of pests and diseases affecting agriculture and forestry. The risk to livestock was a particular concern

Throughout SoNaRR a number of areas have emerged which we believe provide the greatest opportunity to deal with the challenges and risks identified, and contribute to the well-being goals. Evidence presented on the opportunities will be considered for the National Natural Resources Policy and in the preparation of Area Statements. The areas that have emerged are:

	Declining natural resources	Resilience of ecosystems	Optimising benefits	Minimising negative impacts
Green infrastructure in and around urban areas		Contribute to connectivity within and between ecosystems	Multi-benefits of urban green-spaces such as water filtration, accessible places for health and recreation, connecting habitats, and supporting opportunities for community cohesion	Tackling health inequalities and air quality
Increasing woodland cover, and bringing more of our existing woodlands into appropriate management	Will address woodland resource	Contribute to diversity and connectivity of woodlands	Multiple benefits of woodland, including health and recreation benefits, fibre and fuel, and wider catchment management opportunities	
Coastal zone management and managed realignment	Addressing coastal squeeze	Supporting coastal habitat	Supporting coastal communities, for example through providing opportunities for tourism and employment	Future proofing from coastal flooding / sea level rises
Maintaining, enhancing and restoring floodplains and hydrological systems	Water availability	Capacity of catchments to deal with high and low flows; supporting water quality	Supporting recreation and economic activity	Flood risk Social cohesion, equity/local economy
Better soil management	Investment in soils for future productivity	Soils underpin everything	Preventing erosion, supporting other habitats and benefits	Erosion, costs of water treatment etc
Utilisation of our uplands to deliver multiple benefits	Restoring peatland, safeguarding carbon stores	Wider resilience of upland and lowland habitats and species that depend on them	Making better use of Wales natural assets	Tackling climate change; reducing flood risk

As a society, we need to seize these opportunities and take them forward



# Appendix 3: Well-being goals and the sustainable development principle



## Well-being Goals

The seven well-being goals ('the goals') show the kind of Wales we want to see. Together they provide a shared vision for the public bodies listed in the Act to work towards.

They are a set of goals; the Act makes it clear the listed public bodies must work to achieve all of the goals, not just one or two.

Goal	Description of the goal
A prosperous Wales	An innovative, productive and low carbon society which recognises the limits of the global environment and therefore uses resources efficiently and proportionately (including acting on climate change); and which develops a skilled and well-educated population in an economy which generates wealth and provides employment opportunities, allowing people to take advantage of the wealth generated through securing decent work.
A resilient Wales	A nation which maintains and enhances a biodiverse natural environment with healthy functioning ecosystems that support social, economic and ecological resilience and the capacity to adapt to change (for example climate change).
A healthier Wales	A society in which people's physical and mental well-being is maximised and in which choices and behaviours that benefit future health are understood.
A Wales of cohesive communities	Attractive, viable, safe and well-connected communities.
A Wales of vibrant culture and thriving Welsh language	A society that promotes and protects culture, heritage and the Welsh language, and which encourages people to participate in the arts, and sports and recreation.
A globally responsible Wales	A nation which, when doing anything to improve the economic, social, environmental and cultural well-being of Wales, takes account of whether doing such a thing may make a positive contribution to global well-being.



## Sustainable Development Principle

The Act puts in place a 'sustainable development principle' which tells organisations how to go about meeting their duty under the Act.

**In this Act, any reference to a public body doing something “in accordance with the sustainable development principle” means that the body must act in a manner which seeks to ensure that the needs of the present are met without compromising the ability of future generations to meet their own needs.**

*Part 2 'Improved well-being, section 5 'the sustainable development principle, paragraph (1)'.*

Public bodies need to make sure that when making their decisions they take into account the impact they could have on people living their lives in Wales in the future.

There are 5 things that public bodies need to think about to show that they have applied the sustainable development principle. Following these ways of working will help us work together better, avoid repeating past mistakes and tackle some of the long-term challenges we are facing.

### Long term



The importance of balancing short-term needs with the need to safeguard the ability to also meet long-term needs.

### Prevention



How acting to prevent problems occurring or getting worse may help public bodies meet their objectives.

### Integration



Considering how the public body's well-being objectives may impact upon each of the well-being goals, on their other objectives, or on the objectives of other public bodies.

### Collaboration



Acting in collaboration with any other person (or different parts of the body itself) that could help the body to meet its well-being objectives.

### Involvement



The importance of involving people with an interest in achieving the well-being goals, and ensuring that those people reflect the diversity of the area which the body serves.

## Appendix 4: National well-being indicators (pg. 1 of 2)

The national well-being indicators are published, and reported by, the Welsh Government to assess the state of well-being in Wales. Although these are national indicators it is important to consider these matters on a more local level to help address potential issues within the area. As part of this well-being contribution due regard has been given to the national indicators and the table below details the relevant indicators. For each indicator it has been considered if NRW are best placed to report, if it is shown within this pack and any influence NRW may have on an indicator.

Nº	Indicator	Can NRW report on this	Can NRW contribute to improving this	Is this addressed in this pack	Comments
3	Percentage of adults who have fewer than two healthy lifestyle behaviours (not smoking, healthy weight, eat five fruit or vegetables a day, not drinking above guidelines and meet the physical activity guidelines)	No—national health survey for Wales	Yes—NRW is a large landholder in Wales and our forests and nature reserves can be used to help people meet the physical activity guidelines.	Recreation opportunities identified in map 8 includes NRW land	
4	Levels of nitrogen dioxide (NO <sub>2</sub> ) pollution in the air.	Yes—DEFRA data	Yes—NRW is a regulator (EU Ceilings Directive and Gothenburg Protocol)	Yes—(air pollution) includes DEFRA NO <sub>2</sub> data.	
5	Percentage of children who have fewer than two healthy lifestyle behaviours (not smoking, healthy weight, eat five fruit or vegetables a day, not drinking above guidelines and meet the physical activity guidelines)	See indicator Nº 3	See indicator Nº 3	See indicator Nº 3	
8	Percentage of adults with qualifications at the different levels of the National Qualifications Framework.	No	Maybe	No	Learning from the ComeOutside! programme which offered education opportunities to those who need it the most, which could form part of the NQF or can lead onto other education opportunities.
12	Capacity (in MW) of renewable energy equipment installed	Yes and no—data from DECC. NRW regulates many of the sectors.	Yes—NRW regulates the sector and we have instillations on our land.	No	
13	Concentration of carbon and organic matter in soil	Yes (with WG, countryside survey and Glastir—also studies commissioned such as mapping for SoNaRR)	Yes	Yes—although the concentration is not directly shown in the soil map the presence (and depth) of peat is shown and presents opportunities for maintaining and enhancing soil carbon levels. 1km x 1km maps are freely available for carbon concentration and organic matter.	
23	Percentage who feel able to influence decisions affecting their local area.	No—national health survey for Wales	Yes	No	NRW holds local consultations on a range of matters and will do more so in the future with the Env Act and WFGA.
24	Percentage of people satisfied with their ability to get to/ access the facilities and services they need	No—national health survey for Wales	Yes	No	Access to green/blue open spaces is included in this.
26	Percentage of people satisfied with local area as a place to live	No—national health survey for Wales	Yes	No	<ul style="list-style-type: none"> <li>Access to green and blue spaces</li> <li>Local environmental issues such as noise, litter and graffiti including noise mapping</li> </ul>



## Appendix 4: National well-being indicators (pg. 2 of 2)

No	Indicator	Can NRW report on this	Can NRW contribute to improving this	Is this addressed in this pack	Comments
28	Percentage of population who volunteer	No—national health survey for Wales	Yes	No	See learning from the ComeOutside! programme.
29	Mean mental well-being score for people.	No—National Survey for Wales (adults); Understanding Society	Yes	This is touched upon using WG WIMD mental well-being data which is then categorised into quintiles	Also see learning from the ComeOutside! programme.
30	Percentage of people who are lonely	No—national health survey for Wales	Yes	No	See ComeOutside! programme.
32	Number of properties (homes and businesses) at medium or high risk of flooding from rivers and the sea	Yes	Yes	Yes	High risk: greater than 1:30 chance of flooding Medium risk: 1:30 to 1:100 chance of flooding
38	Percentage of people participating in sporting activities three or more times a week	No—national health survey for Wales and Sport Wales school sport survey	Yes	No	We have a lot of sporting activity on our land (MtB, running, fishing etc) and we are in a great position to encourage uptake, esp with the WFGA.
41	Emissions of greenhouse gases within Wales	No—National Atmospheric Emissions Inventory	Yes—NRW regulates industrial emissions	No	NRW regulates air emissions and welsh participants of emissions trading schemes.
43	Areas of healthy ecosystems in Wales	NRW / JNCC	Yes	This is indirectly considered throughout, also see SoNaRR	
44	Status of biological diversity in Wales	JNCC / CEH	Yes		
45	Percentage of surface water bodies and groundwater bodies achieving good or high overall status	NRW	Yes	Yes	