



GREEN INFRASTRUCTURE STRATEGY

March 2019

Volume 1 **Strategic Framework**



Monmouth



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Key Messages

- Planning Policy Wales defines Green Infrastructure as 'the network of natural and semi-natural features, green spaces, rivers and lakes that intersperse and connect places' (such as towns and villages).
- This Green Infrastructure Strategy promotes an integrated and joined up approach to delivering Green Infrastructure that takes into account the needs of Monmouthshire's communities, environment and economy.
- An important overarching principle underpinning the Strategy is the need to recognise the multi-functionality of Green Infrastructure assets and to maximise the benefits different assets can deliver through an integrated approach. For example, greenspaces can be used for sustainable food production, contribute to flood management and provide access to nature for informal recreation.
- It is essential that the inter-relationship and connections between the individual projects outlined in the Green Infrastructure Delivery Plan are considered in the round to ensure that opportunities for shared outcomes and mutual benefits are maximised.

Green Infrastructure Vision for Monmouthshire

Monmouthshire has a well-connected multifunctional green infrastructure network comprising high quality green spaces and links that offer many benefits for people and wildlife.

The network's integrity and connectivity is maintained, protected and enhanced in a planned and managed way, which recognises the interdependency and multifunctionality of landscape, heritage and biodiversity elements.

Investment in green infrastructure underpins the County's ongoing economic, social and environmental success by supporting sustainable growth, improving quality of life and place, delivering ecosystem services and tackling climate change.

Monmouthshire is a green and healthy place to live, with an increasingly coherent and resilient ecological network of wildlife habitats, helping conserve biodiversity.





1

Setting the Scene



Abergavenny

1.1 Introduction

1.1.1 The Green Infrastructure (GI) Strategy sets out Monmouthshire County Council's approach to enhancing biodiversity and increasing ecosystem resilience through GI in line with the Monmouthshire Biodiversity and Ecosystem Resilience Forward Plan prepared under the Environment (Wales) Act 2016. It also sets out the Council's approach to improving health and wellbeing outcomes through GI in line with the objectives of the Monmouthshire Public Service Board Wellbeing Plan prepared under the Wellbeing of Future Generations (Wales) Act 2015.

1.1.2 The GI Strategy has five strategic objectives and associated priorities for guiding the planning, management and delivery of GI in Monmouthshire. These are to:

- Improve Health & Wellbeing
- Enhance Biodiversity & Increase Ecosystem Resilience
- Strengthen Landscape Character & Distinctiveness
- Increase Climate Change Resilience
- Support Sustainable Economic Development

1.1.3 There is great benefit from adopting a collaborative and multi-disciplinary working approach to GI delivery as illustrated on **Diagram 1.1**. At the regional scale, this approach is being championed by the Gwent Green Grid Partnership (GGGP) chaired by Monmouthshire County Council. The Partnership also includes Torfaen County Borough Council, Newport City Council, Caerphilly County Borough Council, Blaenau-Gwent County Borough Council, Natural Resources Wales, NHS Wales and Welsh Government. The GGGP aims to bring together existing partnerships/projects to achieve greater strategic and local impact by providing a framework for connecting other initiatives and strategies; pooling funding; sharing resources and learning around ecosystem resilience, healthy living and climate adaptation; making landscape-scale biodiversity enhancements; and involving partners on a wider footprint.

1.2 Structure of the Strategy

1.2.1 The Strategy was prepared by Chris Blandford Associates (CBA) on behalf of Monmouthshire County Council.

Volume 1 – Strategic Framework (this document)

1.2.2 Volume 1 of the Strategy sets out the Council's strategic framework for GI provision in Monmouthshire. It identifies key priorities and strategic opportunities where the restoration, maintenance, creation or connection of green features and functions would deliver the most significant benefits, both on a county-wide basis and for key settlements where growth is planned in the adopted Local Development Plan (2011-2021).

1.2.3 An Executive Summary of the GI Strategy is set out in a separate document.

Volume 2 – Delivery Plan

1.2.4 Volume 2 of the Strategy provides the Council's delivery plan for GI in Monmouthshire. Provided as a separate document, the Delivery Plan includes prioritised action plans for delivery of strategic/landscape-scale GI projects, and local GI projects to support development at the key growth locations and rural secondary settlements. The action plans are designed to support funding bids by the Council and its delivery partners.

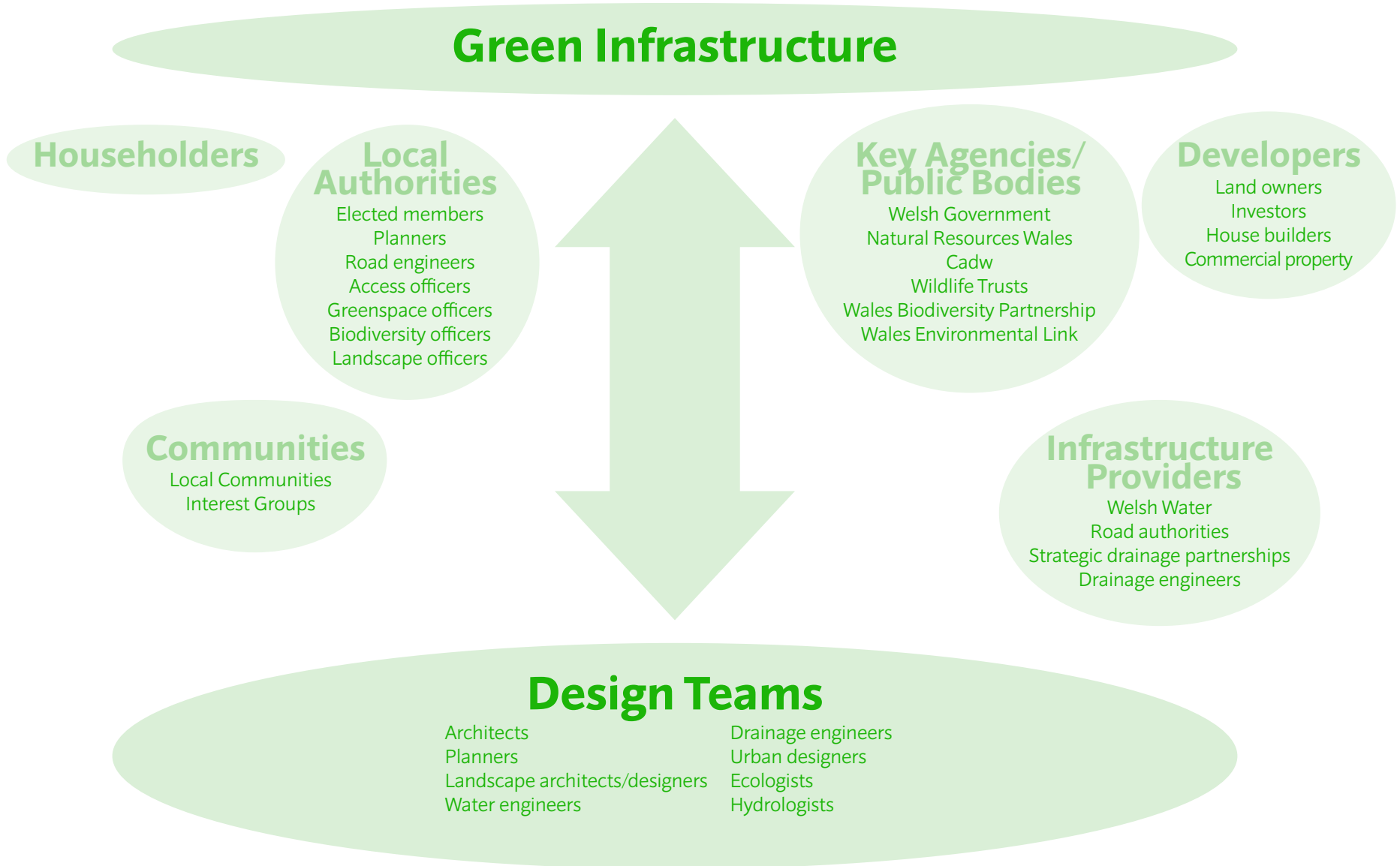
GIS Database of GI Assets

1.2.5 A comprehensive and user-friendly GIS Database of GI assets and related information is held by the Council, which provides a tool for informing land use planning and land management decision-making with regards to GI.

1.2.6 The Green Infrastructure Strategy will be kept under review by the Council and updated as necessary to have regard to changing circumstances.

DIAGRAM 1.1 Multidisciplinary Working

(Adapted from *GI Design and Placemaking* (Scottish Government, 2011))



1.3 Links to Other Documents

1.3.1 The GI Strategy was informed by, and should be read in conjunction with, the other relevant plans and strategies shown on **Diagram 1.2**. The GI Strategy also supports the Brecon Beacons National Park Management Plan 2015-2020 and Natural Resource Action Plan, and the Wye Valley AONB Management Plan 2015-2020.

1.3.2 This GI Strategy should also be read in conjunction with the Council's Green Infrastructure Supplementary Planning Guidance adopted in April 2015. A number of other relevant guidance documents have been/will be produced by the Council, which are interrelated with this GI Strategy. These are listed in **Box 1.1**.

1.3.3 A number of studies and assessments, carried out to inform the development of the adopted Local Development Plan, provide valuable baseline GI information in respect of the location, quality, quantity and accessibility of a range of GI assets/types (see **Boxes 1.2-1.5**). They also form an important starting point in terms of identifying local GI needs and opportunities.

BOX 1.1 Links to Relevant Guidance

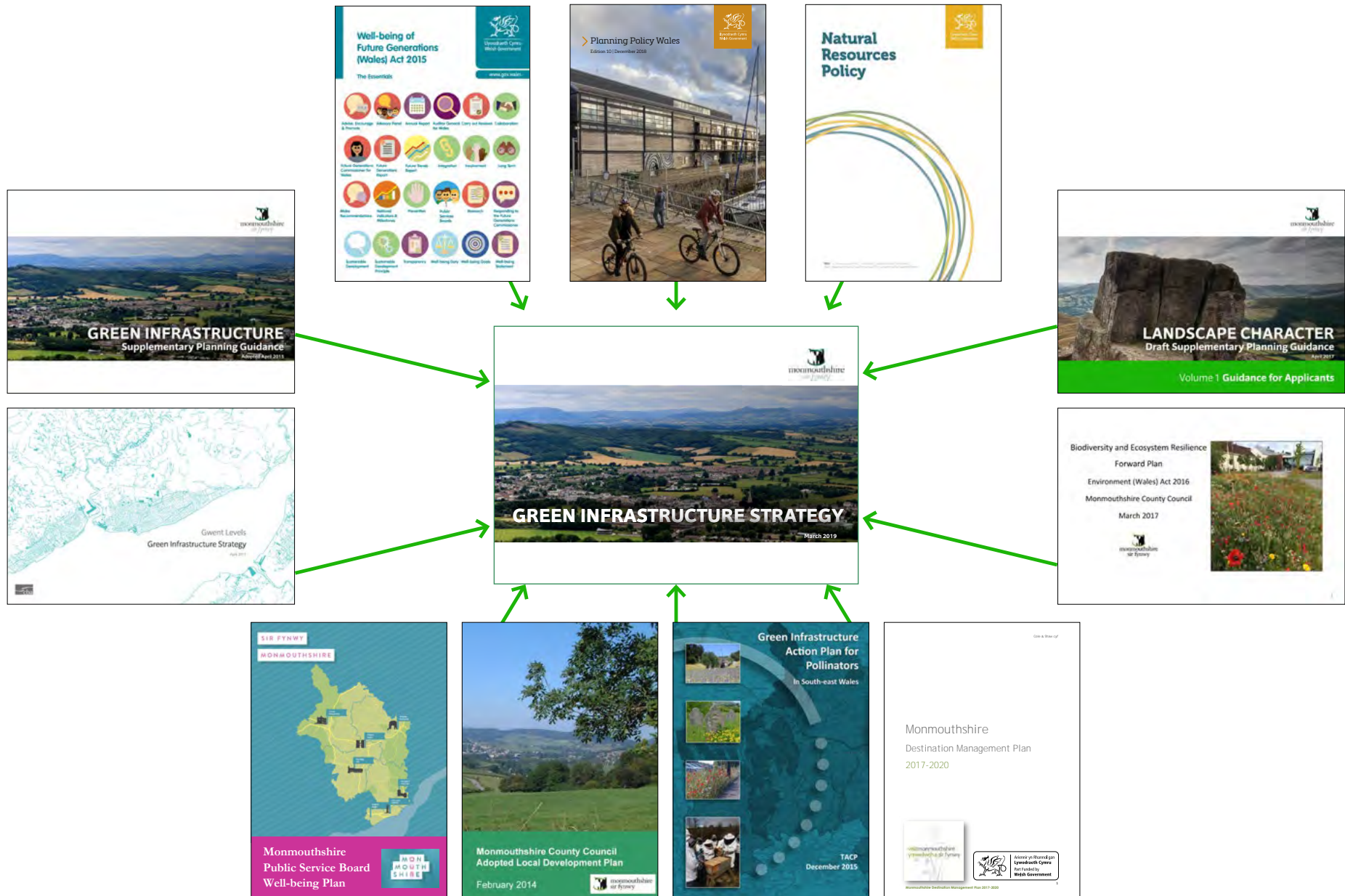
Supplementary Planning Guidance

Green Infrastructure	MCC adopted this SPG in April 2015 to support the interpretation and implementation of GI policies S13 and G11 of the LDP.
Planning Obligations	MCC intends to produce a Planning Obligations SPG (work in progress). The Interim Policy on the Approach to Planning Obligations (March 2013) sets out an approach to guide negotiations for Section 106 planning obligations between MCC and applicants.
Biodiversity	MCC intends to produce a Biodiversity SPG (as part of the revised LDP).
Renewable Energy and Energy Efficiency	MCC adopted this SPG in March 2016 to support the interpretation and implementation of policies S3, S12, SD1, SD2 and DES1 of the LDP.
Landscape Character	MCC intends to produce a Landscape Character SPG (work in progress).

Other Guidance

Interim Landscape Position Statement (2013)	Sets out a protocol to be followed, in the absence of adopted SPG on Landscape Character, in the interpretation of LDP policies S13 and LC5.
Countryside Access Design Guide (2012)	Intended to assist anyone installing countryside furniture on public rights of way (PRoW) and other access areas in Monmouthshire.
Rights of Way Network Condition & Opportunities Study (2017)	Sets out the condition of the County's Public Rights of Way network and opportunities for improving countryside access.
Public Rights of Way Biodiversity Action Plan (2011)	Aims to ensure that biodiversity is taken into account in the planning and carrying out of all maintenance operations, improvement schemes and other PRoW work. Sets out specific habitat and species action plans.
Gwent Levels Green Infrastructure Strategy (2017)	Provides an overarching long-term vision, principles and framework for the planning and delivery of GI through the Living Levels Landscape Partnership Scheme.

DIAGRAM 1.2 Links to Other Relevant Plans & Strategies



BOX 1.2 Open Space Study (2008)

Sets out the results of an audit of all open space sites located within 13 settlements/sub-areas in Monmouthshire. Findings relate to the quantity, quality and accessibility of sites/open space types. An assessment of provision against minimum standards is provided.

It should be noted that the definition given to natural/semi-natural greenspace differs to that in the Greenspace Study. This is likely to have a bearing on the levels of provision (surplus/deficiency) identified in the Study. Further advice can be sought from MCC (see **Appendix G**). The Study will be updated as part of the LDP revision process.



Allotments form part of the typology of open spaces in Monmouthshire

BOX 1.3 Greenspace Study (2010)

Identifies potential greenspace sites, natural sites and accessible natural sites within a 2km buffer zone of 10 settlements/sub-areas in Monmouthshire. An analysis of provision and assessment of opportunities for improvement in relation to accessible natural greenspace is provided.

It should be noted that greenspaces were identified on the basis of available datasets, which suggests that additional sites may exist. Further advice can be sought from MCC (see **Appendix G**). The Study will be updated as part of the LDP revision process.



The grounds of Caldicot Castle provide accessible greenspace

BOX 1.4 Ecological Connectivity Assessment (2010)

Provides an objective assessment of semi-natural habitat connectivity in and around eight settlements/sub-areas in Monmouthshire. This forms the basis for identifying and informing future habitat management and creation opportunities.

The value of the Assessment's maps and the accuracy with which predictions can be made will be enhanced as the baseline datasets are verified. Further advice can be sought from MCC (see **Appendix G**). The Assessment will be updated as part of the LDP revision process.



The Usk Valley is an important ecological corridor within Monmouthshire

BOX 1.5 Other Studies

Landscape Sensitivity and Capacity Studies (2009/2010)

These studies set out detailed assessments of sensitivity and capacity of local landscape character areas (around main settlements and villages) and candidate strategic sites. These studies will be updated as part of the LDP revision process.

Strategic Transport Study (2009)

Provides some baseline information relating to sustainable modes of transport and possible transport proposals around 24 candidate development sites.



The landscape setting of Llanellen



2

The Green Infrastructure Approach



Start of Wales Coast Path, Chepstow

2.1 Local Policies

Local Development Plan

2.1.1 This GI Strategy is intended to expand on policies S13 (see **Box 2.1**) and GI1 (see **Box 2.2**) of the adopted LDP (2011-2021), which are central to the protection and delivery of GI as part of development in the County. Other key adopted LDP policies that relate to GI are listed in **Diagram 2.1**.

BOX 2.1 Strategic Policy S13 Landscape, Green Infrastructure & the Natural Environment

Development proposals must:

- 1 Maintain the character and quality of the landscape by:
 - (i) Identifying, protecting and, where appropriate, enhancing the distinctive landscape and historical, cultural, ecological and geological heritage, including natural and man-made elements associated with existing landscape character;
 - (ii) Protecting areas subject to international and national landscape designations;
 - (iii) Preserving local distinctiveness, sense of place and setting;
 - (iv) Respecting and conserving specific landscape features, such as hedges, trees and ponds;
 - (v) Protecting existing key landscape views and vistas.
- 2 Maintain, protect and enhance the integrity and connectivity of Monmouthshire's green infrastructure network.
- 3 Protect, positively manage and enhance biodiversity and geological interests, including designated and non-designated sites, and habitats and species of importance and the ecological connectivity between them.
- 4 Seek to integrate landscape elements, green infrastructure, biodiversity features and ecological connectivity features, to create multifunctional, interconnected spaces that offer opportunities for recreation and healthy activities such as walking and cycling.

BOX 2.2 Development Management Policy GI1 Green Infrastructure

Development proposals will be expected to maintain, protect and enhance Monmouthshire's diverse green infrastructure network by:

- a) Ensuring that individual green assets are retained wherever possible and integrated into new development. Where loss of green infrastructure is unavoidable in order to secure sustainable development appropriate mitigation and/or compensation of the lost assets will be required;
- b) Incorporating new and /or enhanced green infrastructure of an appropriate type, standard and size. Where on-site provision of green infrastructure is not possible, contributions will be sought to make appropriate provision for green infrastructure off-site.



Pollinator Policy

2.1.2 A Pollinator Policy was adopted by MCC in 2014 in response to the Welsh Government's Action Plan for Pollinators to demonstrate the Council's commitment to change and in recognition of our role as land managers. Prepared in partnership with Bee Friendly Monmouthshire, the policy commits MCC to:

- Reduce mowing of road verges - safety cut only for first cut on A & B routes
- Reduce mowing of green spaces
- Urban wildflower planting in towns/villages in place of unsustainable flower beds
- Identify opportunities for development of meadows within open spaces
- Use the Bee Friendly Monmouthshire logo to raise awareness
- Monitor the effectiveness of changes

DIAGRAM 2.1 Relevant adopted LDP Policies



2.2 National Legislative and Policy Context

2.2.1 The concept of a GI approach to land-use planning, design and management can deliver a wide range of policy outcomes (e.g. in relation to sustainable development, climate change, biodiversity, place-making, economic growth and health and well-being). It is well established through the Welsh spatial planning system and provides a means to bring together and deliver policy and advice messages in a holistic way. National legislation and policies that provide the framework for the conservation, delivery and promotion of GI in Monmouthshire are listed in **Box 2.3**.

BOX 2.3 National Legislative & Policy Context

The Environment (Wales) Act 2016

Section 4 of the Act sets out principles for promoting a joined-up and sustainable approach to the management of natural resources and ecosystem services in Wales. The Act places a duty (Section 6) on public bodies to prepare a Biodiversity and Ecosystem Resilience Forward Plan, demonstrating how they intend to deliver the plan in collaboration with other partners, taking into consideration the Nature Recovery Plan for Wales and the Well-being of Future Generations Act. Section 7 of the Act requires Welsh Government, in consultation with NRW, to publish a list of the organisms and habitats of principal importance (priority habitats), and take all reasonable steps to maintain and enhance this list, including encouraging others to do the same.

Natural Resources Policy (Welsh Government, 2017)

A statutory requirement of the Environment (Wales) Act, this sets out Welsh Government's policy for the sustainable management of Wales' natural resources to maximise their contribution to the goals of the Well-being of Future Generations Act. The Policy outlines three national priorities: delivering nature-based solutions; increasing renewable energy and resource efficiency; and taking a place-based approach. The Policy sets the context for the State of Natural Resources Report (SoNaRR) and Area Statements produced by NRW, which aim to ensure that the national priorities inform the approach to local delivery.

Wellbeing of Future Generations (Wales) Act 2015

This Act seeks to improve the social, economic, environmental and cultural well-being of Wales. Public bodies must do what they do in a sustainable way and think more about the long term; work better with people and communities and each other; look to prevent problems; and take a more joined-up approach to delivering services and advice. Public bodies need to make sure that, when making their decisions, they take into account the impact they could have on people living in Wales. The Act includes GI related indicators for monitoring implementation, such as:

- Areas of healthy ecosystems in Wales.
- Status of Biological diversity in Wales.
- Percentage of surface water bodies, and groundwater bodies, achieving good or high overall status.
- Emissions of greenhouse gases within Wales.
- Levels of nitrogen dioxide (NO₂) pollution in the air.
- The Ecological Footprint of Wales.
- Percentage of people feeling safe at home, walking in the local area, and when travelling.

Nature Recovery Plan for Wales (Welsh Government, 2015)

The Plan sets out how Wales will deliver the commitments of the UN Convention on Biological Diversity and the EU Biodiversity Strategy to halt the decline in biodiversity by 2020. It includes a strategy for our current and proposed action, particularly through the Well-being of Future Generations Act, and through the Sustainable Management of Natural Resources, will contribute to reversing the loss of biodiversity in Wales. Part 2 of this plan is an Action Plan setting out those actions which have been specifically identified to meet objectives to reverse the decline of biodiversity.

Vital Nature: Making the Connections between Biodiversity and the People and Places of Wales (NRW, 2018)

Vital nature is NRW's strategic steer for biodiversity to 2022. It sets out NRW's priorities, direction of travel and ways of working with regards to delivering its Biodiversity and Ecosystem Resilience duties through the Sustainable Management of Natural Resources. Through a series of goals and commitments, it establishes a high-level framework for action in line with the Nature Recovery Action Plan for Wales.

National Development Framework The NDF is in production, and will set out a 20-year land use framework for Wales and replacing the current Wales Spatial Plan. The NDF will be reviewed every 5 years, and will set out where nationally important growth and infrastructure is needed and how the planning system can deliver it. It will provide direction for Strategic and Local Development Plans and support the determination of Developments of National Significance; sitting alongside Planning Policy Wales, which sets out the Welsh Government's planning policies and which will continue to provide the context for land use planning. It will support national economic, transport, environmental, housing, energy and cultural strategies and ensure they can be delivered through the planning system

Planning Policy Wales: Edition 10 (Welsh Government, 2018) Chapter 6 of PPW sets out Welsh Government's planning policy on maintaining and/or incorporating GI as key components of distinctive and natural places to maximise health and well-being of communities and the environment. PPW requires planning authorities to adopt a strategic and proactive approach to GI and biodiversity by producing up to date Green Infrastructure Assessments (para 6.2.6). The Assessments should be used to develop a robust approach to enhancing biodiversity, increasing ecological resilience and improving wellbeing outcomes; and should identify key strategic opportunities where the restoration, maintenance, creation or connection of green features and functions would deliver the most significant benefits (6.2.7). See **Appendix E** for full details.

Technical Advice Note 5: Nature Conservation and Planning (Welsh Government, 2009) Provides advice about how the land use planning system should contribute to protecting and enhancing biodiversity and geological conservation. Supplements Planning Policy Wales and should be read in conjunction with it.

Technical Advice Note 12: Design (Welsh Government, 2016) Provides advice on good design. Supplements Planning Policy Wales and should be read in conjunction with it.

Technical Advice Note 15: Development and Flood Risk (Welsh Government, 2004) Provides advice in relation to development and flooding, advising on development and flood risk as this relates to sustainability principles. Supplements Planning Policy Wales and should be read in conjunction with it.

Technical Advice Note 16: Sport, Recreation and Open space (Welsh Government, 2009) Provides advice for communities, developers and local planning authorities in Wales preparing local development plans and taking decisions about planning applications with regards to sport, recreation and open space. Supplements Planning Policy Wales and should be read in conjunction with it.

Natural Heritage: a Pathway to Health (Countryside Council for Wales Policy Research for the Welsh Assembly Government, 2007) Sets out the findings of a 12 month study into the impact of the natural environment on health and wellbeing, conducted by the Institute of Rural Health. The study found that the natural environment can play a key role in improving public health and wellbeing.

Active Travel Action Plan for Wales (Welsh Government, 2016) Summarises the key steps planned to increase levels of walking and cycling in Wales - to realise the benefits that active travel brings for both individuals and society.

Framework for South East Wales Networked Environmental Regions (CCW, EA Wales & Wales Environmental Link for Welsh Government, 2009) First stage in a collaborative project to turn the concept of a Networked Environmental Region (NER) into reality. The report reviews the policy context, briefly describes the unique characteristics of the South East Wales landscape and considers opportunities and challenges across the city region. It also highlights the next steps needed towards implementing the NER.

Community Grown Food Action Plan (Welsh Government, 2010) Action Plan to promote, support and encourage opportunities for community grown food in Wales.

2.3 What is GI?

2.3.1 The Landscape Institute's GI Position Statement (2013) provides a number of useful definitions for key GI terms.

GI

2.3.2 ***'GI is the network of natural and semi-natural features, green spaces, rivers and lakes that intersperse and connect villages, towns and cities. Individually, these elements are GI assets, and the roles that these assets play are GI functions. When appropriately planned, designed and managed, the assets and functions have the potential to deliver a wide range of benefits – from providing sustainable transport links to mitigating and adapting the effects of climate change'.***

GI assets

2.3.3 ***'GI assets range from country parks, lakes and woodlands to urban interventions such as green roofs and street trees. They can be specific sites at the local level or broader environmental features at the landscape scale within and between rural and urban areas such as wetlands, moors and mountain ranges' (see Box 2.4).***

BOX 2.4 Examples of GI Assets

- **Parks and gardens** including urban parks; country and regional parks; formal and private gardens; and institutional (e.g. schools and hospitals) grounds (e.g. Caldicot Country Park and the Linda Vista Gardens in Abergavenny).
- **Amenity greenspaces** including informal recreation spaces; play areas; outdoor sport facilities; housing green spaces; domestic gardens; village greens; urban commons; other incidental space; green roofs; hedges; civic squares and spaces; and highway trees and verges (e.g. Fairview open space Chepstow, Undy playing field and Dixton Field in Monmouth).
- **Allotments, community gardens, city farms, orchards, roof gardens, and urban edge farmland** (e.g. Usk Road allotments in Raglan and Sudbrook Road allotments in Portskewett/Sudbrook).
- **Cemeteries and churchyards** (e.g. Osbaston cemetery in Monmouth and St Mary's Churchyard in Abergavenny).
- **Natural and semi-natural rural, peri-urban and urban greenspaces** including woodland and scrub; grassland, heath and moor; wetlands; open and running water; brownfield sites; bare rock habitats (e.g. cliffs and quarries); coast and beaches; and Community Forests. It includes important and protected species and habitats such as existing national and local nature reserves and locally designated sites for nature conservation (e.g. Nedern Brook Wetlands SSSI and Fiddler's Elbow National Nature Reserve).
- **Green corridors** including rivers and canals and their banks; road and rail corridors; cycling routes; and public rights of way (e.g. Ifton Lane in Rogiet and the River Usk).
- **Functional green space** including sustainable urban drainage schemes and flood storage (e.g. residential development in Rogiet).
- **Heritage sites** including historic country estates; historic urban public parks; and historic sites and monuments (e.g. St Pierre near Chepstow and Abergavenny Castle and grounds).

Adapted from the Town and Country Planning Association: 'The essential Role of Green Infrastructural: Eco-towns Green Infrastructure Worksheet' (2008).





Heritage sites



Private gardens



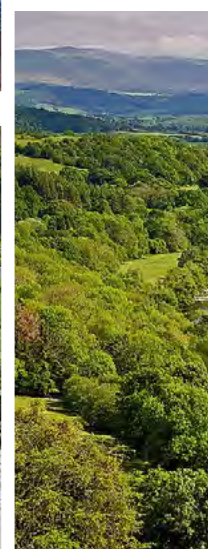
Allotments



Green walls



Community greenspaces



GI ASSETS



Grasslands, heaths and moors

GI ASSETS



Village greens



Churchyards



Gardens



Play areas

GI multifunctionality

2.3.4 *'GI functions are the roles that assets can play if planned, designed and managed in a way that is sensitive to, and includes provision for, natural features and ecosystem services. They may have obvious primary functions, but each asset can perform different functions simultaneously – a concept known as multifunctionality'*.

GI and ecosystem services

2.3.5 Underpinning the multiple functions that GI assets perform is the concept of ecosystem services. Ecosystem services are defined as the benefits provided by environmental/GI that contribute to making life both possible and worth living (e.g. clean air, water, food and materials) - see **Box 2.5**.

2.3.6 Since 2012, the Welsh Government has been actively promoting a new approach to natural resource management through the Living Wales programme, known as the ecosystem approach. This approach provides a framework for the integrated management of land, water and living resources that promotes conservation and sustainable land use in an equitable way. The adoption and implementation of this more holistic, integrated and sustainable approach to natural resource management is synonymous with a GI approach to land use management.

BOX 2.5 Ecosystem Services

- **Supporting services** - essential to the functioning of ecosystems and indirectly responsible for all other services; includes water and nutrient cycling, soil formation and the processes of plant growth.
- **Regulating services** - includes regulating climate, flooding, water and air quality, erosion and pollination.
- **Provisioning services** - includes the supply of goods such as food, timber, fresh water, fuel and pharmaceuticals.
- **Cultural services** - non-material direct benefits of huge importance to the wider social and cultural needs of society; includes recreational space, tourism, spiritual enrichment, inspiration and employment.

GI connectivity

Whilst individual GI assets can serve one or more functions, *'connectivity between different GI assets can help maximise the benefits that they generate. Well-connected GI assets create infrastructure that is adaptive and resilient to changes in climate. Physical connections make the most impact, often by creating ecological 'stepping stones' that encourage biodiversity migration and connect places with sustainable walking or cycling routes.'*

Linked together, GI assets form important multifunctional GI networks. GI assets and connections should be considered at all spatial scales, as illustrated on **Diagram 2.2**.

GI benefits

'A GI approach enables landscapes to deliver social, economic and environmental benefits simultaneously and then looks at how those benefits can be multiplied by being connected to a wider network of spaces' (Landscape Institute *GI Position Statement*, 2013). GI benefits are wide-ranging, as illustrated in **Box 2.6**.

DIAGRAM 2.2 Range of GI Scales/Connectivity

Adapted from GI Design and Placemaking (Scottish Government, 2011)



BOX 2.6 GI Benefits

Adapted from GI Design and Placemaking (Scottish Government, 2011)



Local distinctiveness

- Improving townscape, landscape quality and visual amenity.
- Heritage preservation and cultural expression.
- Reinforcing the local landscape character.
- Making places more interesting and distinctive.
- Giving places character and a strong identity.



Economic

- Supporting a reduction in healthcare costs and increased productivity.
- Helping attract and retain a quality workforce.
- Supporting the local green economy.
- Reducing environmental costs such as those associated with the reduction of flood risk.
- Improving the image of a place.
- Boosting property values including house prices due to proximity to greenspace.
- Helping developers get the most out of the site by combining uses, e.g. open space & Sustainable Drainage Systems (SuDS), helping development viability.
- Attracting businesses and inward investors by creating attractive settings.
- Saving energy and money for residents and end users.
- Generating employment.



Climate change

- Reducing CO₂ emissions by providing non-vehicular travel routes and encouraging walking and cycling.
- Providing carbon storage and sequestration in vegetation.
- Providing shelter and protection from extreme weather.
- Managing flood risk: living roofs, large trees and soft landscape areas absorb heavy rainfall.
- Providing for storage of surface water in times of peak flow in SuDS and other water features.
- Cleaning and cooling the air, water and soil, countering the 'heat island' effect of urban areas.
- Saving energy: through using natural rather than engineered solutions.
- Saving energy: living roofs insulate buildings, and large trees provide shade, reducing the need for air.
- Conditioning in the summer and raising ambient temperatures in the winter, reduction in heating costs in the winter due to slowing of wind speeds in urban areas.
- Supplying locally sourced timber, biomass or other bio-fuels to replace fossil fuels.

BOX 2.6 GI Benefits

(Adapted from GI Design and Placemaking (Scottish Government, 2011))



Environmental

- Protecting and enhancing biodiversity.
- Reducing pollution through use of SuDS and buffer strips.
- Providing new and linking existing habitats or natural features, to allow species movement and increase available habitat areas.
- Protecting aquatic species through appropriate management of waterside habitats.
- Preventing fragmentation of habitats.
- Allowing diverse habitats to be created which are rich in flora and fauna.



Community and social

- Improving community cohesion and social inclusion.
- Creating green spaces for socialising, interaction and events.
- More opportunities and places for children to play.
- Providing improved physical connections through green networks to get between places; and to communities, services, friends and family and wider green spaces.
- Providing spaces for practising and promoting horticultural skills.
- Creating opportunities for community participation and volunteering.
- Providing spaces for education and training.



Health and well-being

- Encouraging exercise and physical activity by providing quality green spaces for walking, cycling, sports and play.
- Providing better opportunities for active travel and physical activity.
- Improving mental well-being by providing access to nature and attractive green spaces and breathing spaces.
- Providing opportunities for growing food locally and healthy eating.

2.4 Monmouthshire's Existing GI Network

2.4.1 This section provides an overview of Monmouthshire's existing GI network. A detailed assessment of existing GI assets within different parts of the County is provided in **Appendix D1**.

Monmouthshire's GI network

2.4.2 The County of Monmouthshire lies in South East Wales, between the major centres in South Wales and the South West of England and the Midlands. It covers an area of approximately 88,000 hectares and has an estimated population of 91,323 (2011 census); only 53% of which lives in wards defined as being in 'urban areas'. The main settlements are the three historic market towns of Abergavenny, Chepstow and Monmouth; Caldicot; Usk and Magor/Undy. The landscape is predominately rural with agriculture and tourism forming the main industries.

2.4.3 Monmouthshire is noted for its rural beauty and has a rich and diverse landscape stretching from the flat open coastline of the Gwent Levels in the south, to the exposed uplands of the Black Mountains in the north and the picturesque river corridor of the Wye Valley in the east (MCC, LDP). The Blaenavon Industrial World Heritage Site (WHS), Brecon Beacons National Park and Wye Valley Area of Outstanding Natural Beauty, landscapes of international/national value, are all distinctive features which partly fall within Monmouthshire.

2.4.4 The County includes a wealth of biodiversity/nature conservation assets such as the Severn Estuary, Fiddler's Elbow National Nature Reserve, 56 Sites of Special Scientific Interest, 10 of which are designated as European Sites, 650 non-statutory Sites of Importance for Nature Conservation (SINC) and a wide range of species and important habitats. Monmouthshire is particularly well wooded with a range of extensive blocks of ancient, semi-natural, broadleaved and coniferous woodlands such as Trellech Forests, Hale Wood and Chepstow Park Woods. Numerous watercourses (and associated predominantly undeveloped floodplains) cross the County - the main rivers are the Usk, the Wye and the Monnow.

2.4.5 Despite the range of habitats across the county, the Monmouthshire Biodiversity and Ecosystem Resilience Forward Plan (2017) notes that '*the extent and quality of habitats in the County is largely reducing*'. In addition, a number of the European Sites are in unfavourable condition.

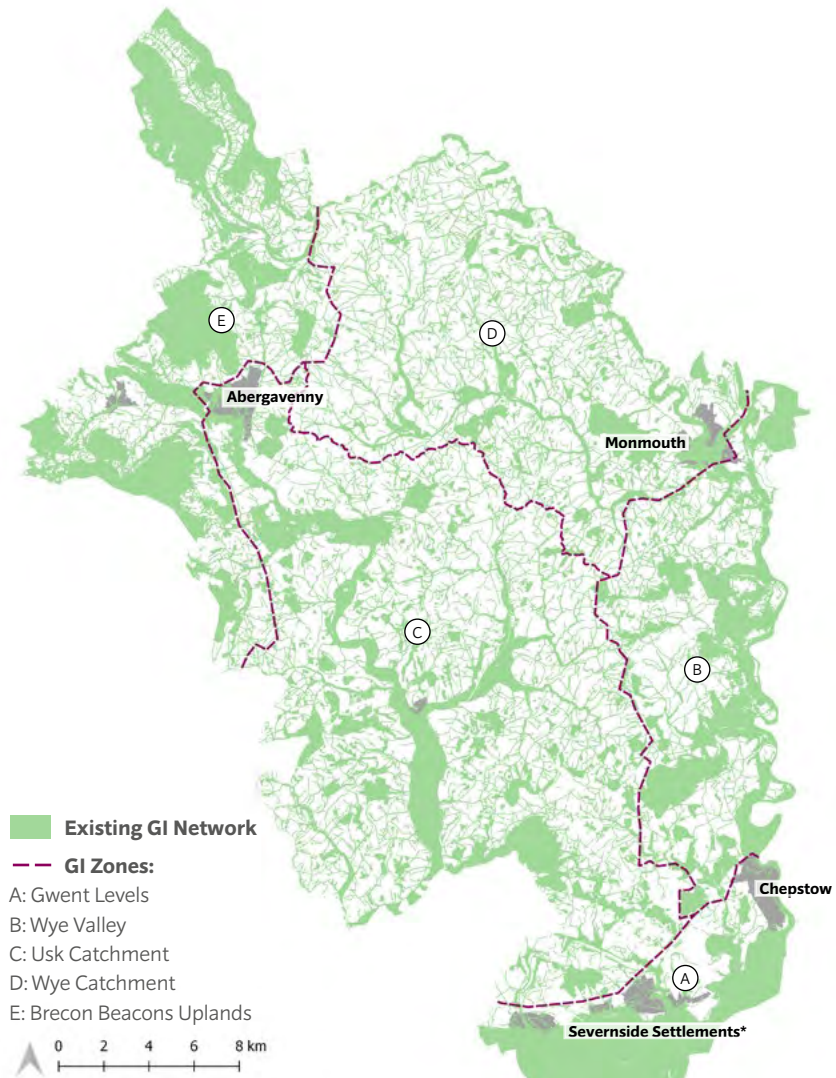
2.4.6 Monmouthshire also contains a rich built heritage and historic environment which includes conservation areas, historic parks and gardens, scheduled ancient monuments and approximately 2200 listed buildings. As well as those GI assets already described, the County comprises a range of open/green spaces (e.g. allotments, parks and outdoor sport areas) located in and around the main settlements. There are also a number of existing 'Incredible Edible' sites and community orchards as well as the traditional allotment settings.

2.4.7 An extensive network of public rights of way provides a range of sustainable access routes for people (non-motorised users) and wildlife across Monmouthshire. It enables movement between settlements and GI assets, to the wider countryside and to amenities beyond the County boundary. This network is complemented by permissive paths, three long distance regional trails, a national trail and two national cycle routes. The All-Wales Coast Path also starts in Monmouthshire. Farmland, private gardens, street trees and other features (e.g. green roofs and SuDS) are other examples of GI assets in Monmouthshire.

2.4.8 As indicated by the above context analysis, Monmouthshire contains a wide range of GI assets. They include public and private assets, with and without public access. Grouped together they represent the County's existing GI network, the extent of which (based on available GI datasets) is shown in **Diagram 2.3**. It should be noted that this diagram only illustrates GI assets within Monmouthshire. However, it should be recognised that some 'landscape-scale' assets extend across administrative boundaries, such as the Wye Valley and the coastline. It is therefore of primary importance that GI is strategically planned to provide a comprehensive and integrated network at the strategic scale.

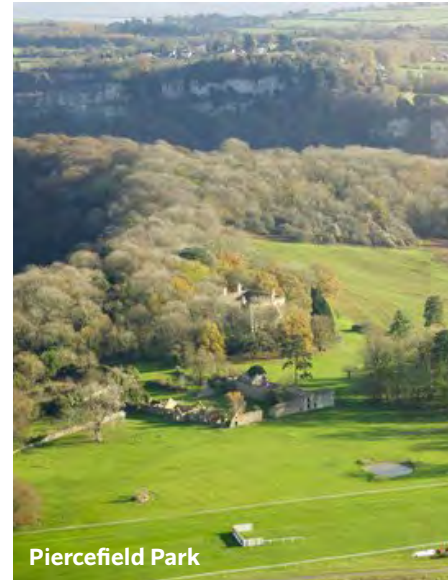
2.4.9 An assessment of the ecosystem services provided by Monmouthshire's GI assets within different parts (or GI Zones) of the County is set out in **Appendix D2**.

DIAGRAM 2.3 Monmouthshire's Existing GI Network



*Includes: Magor and Undy, Rogiet, Caldicot, Portskewett, Sudbrook and Caerwent

The existing GI network represents GI assets defined by the following datasets: Greenspace Study (excluding non-natural greenspace), Open Space Study, county-wide public rights of way, county-wide designated sites of nature conservation value, county-wide designated features of historic value, county-wide watercourses and water bodies, predominantly undeveloped floodplains (flood risk areas), and county-wide woodlands. See Appendix B for details.







3

Green Infrastructure Strategy



Skirrid Fawr, from the Sugar Loaf

3.1 General

3.1.1 Communities in Monmouthshire depend on the benefits provided by its natural systems to live and prosper. Over centuries, humans have developed methods of controlling the environment for their own benefit, such as channelling water by diverting rivers and draining the land for agriculture. These changes can result in unintended consequences elsewhere, such as flooding and habitat fragmentation. As a result, the long-term sustainability, resilience and capacity of natural systems in Monmouthshire to respond to environmental change and human pressures is at risk.

3.1.2 Careful planning and management is important in identifying interventions that maximise the multiple functions and benefits which integrated networks of GI can provide. There are opportunities for GI creation, enhancement and investment in Monmouthshire, which in turn can benefit local communities, the economy and the environment. This strategic framework identifies important elements of the GI network that require protection and management actions to improve their function or quality.

3.2 Vision for GI in Monmouthshire

3.2.1 The long-term aspirational vision for the future provision and management of GI in Monmouthshire is set out in **Box 3.1**.

3.2.2 The GI vision is underpinned by the following three core aims:

1. **Enrich people's lives through engagement and activity**
2. **Build strong and vibrant places and communities in Monmouthshire**
3. **Conserve, protect and enhance Monmouthshire's GI assets**

3.2.3 Together, the vision and three core aims provide the overarching framework for positive actions by all stakeholders involved in the future protection, management and enhancement of GI in Monmouthshire.

BOX 3.1 Green Infrastructure Vision for Monmouthshire

Monmouthshire has a well-connected multifunctional green infrastructure network comprising high quality green spaces and links that offer many benefits for people and wildlife.

The network's integrity and connectivity is maintained, protected and enhanced in a planned and managed way, which recognises the interdependency and multifunctionality of landscape, heritage and biodiversity elements.

Investment in green infrastructure underpins the County's ongoing economic, social and environmental success by supporting sustainable growth, improving quality of life and place, delivering ecosystem services and tackling climate change.

Monmouthshire is a green and healthy place to live, with an increasingly coherent and resilient ecological network of wildlife habitats, helping conserve biodiversity.



3.3 Strategic GI Objectives and Priorities

3.3.1 The GI Strategy's vision and core aims are supported by five strategic objectives and associated priorities for guiding the planning, management and delivery of GI in Monmouthshire (see **Box 3.2**). These objectives and priorities are reflected in the GI projects identified in the Delivery Plan (see Volume 2), and are also intended to be used in monitoring the outcomes of projects.

BOX 3.2 Strategic Green Infrastructure Objectives

1. **Improve Health & Wellbeing**
2. **Enhance Biodiversity & Increase Ecosystem Resilience**
3. **Strengthen Landscape Character & Distinctiveness**
4. **Increase Climate Change Resilience**
5. **Support Sustainable Economic Development**



Provision of public open space

3.3.2 The GI Strategy supports many of the national well-being goals (see **Box 3.3**) that public bodies have a duty under the Wellbeing of Future Generations Act to contribute to, in delivering sustainable development as defined in the Act - *to ensure that the needs of the present are met without compromising the ability of future generations to meet their own needs.*

BOX 3.3 National Wellbeing Goals

1. **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.*
2. **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).*
3. **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.*
4. **A More Equal Wales** - *a society that enables people to fulfil their potential no matter what their background or circumstances (including their socio-economic background and circumstances).*
5. **A Wales of Cohesive Communities** - *attractive, viable, safe and well-connected communities.*
6. **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.*
7. **A Globally Responsive 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.*

Well-being of Future Generations (Wales) Act 2015

3.3.3 In addition, the GI Strategy also promotes the following five “ways of working” advocated by the Wellbeing of Future Generations Act:

- **Integration** – it reflects a joined up approach to communities and people, the economy, the environment and culture.
- **Long-term thinking** – the Strategy aims to balance current and long-term needs for GI.
- **Prevention** – the GI Strategy encourages taking action now to prevent problems in the future.
- **Collaboration** – it promotes working with a range of stakeholders to meet its GI objectives
- **Involvement** – it involves people affected by actions in delivery of GI projects.

3.3.4 At a local level, the GI Strategy also seeks to contribute to the well-being objectives of the Monmouthshire Public Service Board Well-being Plan (see **Box 3.4**).

BOX 3.5 Local Well-being Objectives

1. **Provide children and young people with the best possible start in life**
2. **Respond to the challenges associated with demographic change**
3. **Protect and enhance the resilience of our natural environment whilst mitigating and adapting to the impact of climate change** (see **Appendix F** for details)
4. **Develop opportunities for communities and businesses to be part of an economically thriving and well-connected county**

Monmouthshire Public Service Board Well-being Plan (Monmouthshire PSB, February 2018)

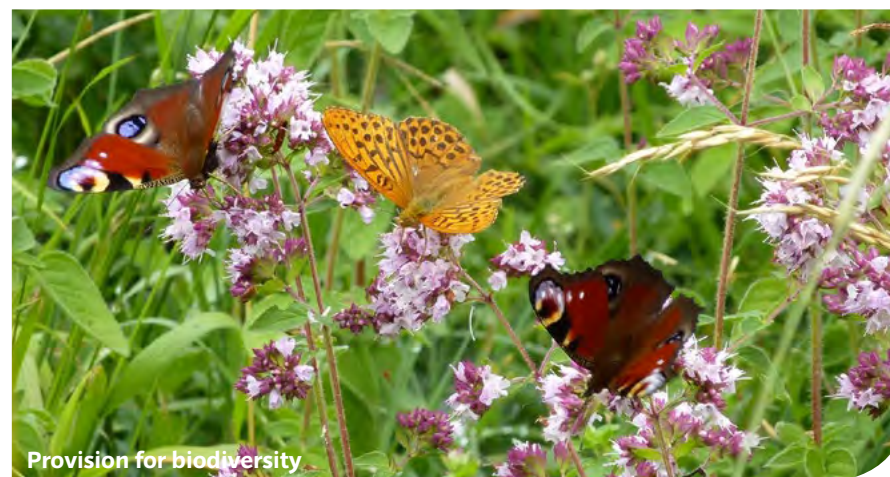
3.3.5 The GI Strategy also supports the objectives of the Monmouthshire Biodiversity and Ecosystem Resilience Forward Plan (see **Box 3.5**) developed by the Council in line with its duties under the Environment (Wales) Act 2016.

BOX 3.4 Monmouthshire Biodiversity & Ecosystem Resilience Forward Plan Objectives

1. **Embed biodiversity throughout decision making at all levels**
2. **Provide environmental education to raise awareness and encourage action**
3. **Undertake land management for biodiversity and promote ecosystem resilience**
4. **Influence land management to improve ecosystem resilience**
5. **Tackle key pressures on species and habitats**
6. **Support landscape scale projects and partnerships to maximise delivery**
7. **Monitor the effectiveness of the plan and review**

See **Appendix H** for full details

Monmouthshire Biodiversity & Ecosystem Resilience Forward Plan (MCC, March 2017)



Provision for biodiversity

Objective 1 – Improve Health & Wellbeing

3.3.6 Contributing to improving the health and well-being of communities in Monmouthshire is a key objective for the GI Strategy.

3.3.7 The GI Strategy's priorities for improving the health and well-being of communities in Monmouthshire are:






- Helping people to live healthier and more fulfilled lives through improved access to outdoor opportunities for health and wellbeing.
- Promoting actions that enable and encourage local communities to use, manage and enjoy their local areas for health, wellbeing and community cohesion – with a particular focus on disadvantaged communities and active travel routes.
- Promoting opportunities for sustainable access and recreation that encourage healthy lifestyles and improve well-being for communities in Monmouthshire, including creating and improving safe and pleasant off-road walking and cycling routes.
- Access to GI assets via public rights of way, cycle routes and navigable waterways should be enhanced to maximise opportunities for urban communities and visitors to enjoy the Monmouthshire countryside.

- Provision of well-connected, multifunctional greenspaces close to urban communities in Monmouthshire to encourage physical exercise, and create community gardens/allotments and places for people to meet and interact.
- Support opportunities for community growing initiatives and local sourcing of food production
- Seek opportunities to improve air quality supporting interventions in key areas such as Chepstow, Usk, Abergavenny and across the Severnside area

3.3.8 This objective contributes towards National Wellbeing Goal 3 (creating 'A Healthier Wales' in respect of people's physical and mental well-being), Goal 5 ('A Wales of Cohesive Communities' in respect of creating well-connected communities) and Goal 6 (creating 'A Wales of Vibrant Culture and Thriving Welsh Language' in respect of participation in recreational activities).

3.3.9 This objective for improving the health and well-being of communities in Monmouthshire also contributes towards Local Wellbeing Objectives 1 and 3.

3.3.10 Subject to grant funding from the Welsh Government, the Regional Gwent Green Grid Partnership is proposing to produce a Health Impact Assessment of regional GI provision that will feed into local GI strategies.

GI Strategy Objective	National Well-being Goals (see Box 3.3)							Local Well-being Objectives (see Box 3.4)				Biodiversity & Resilience Forward Plan Objectives (see Box 3.5)							
	1	2	3	4	5	6	7	1	2	3	4	1	2	3	4	5	6	7	
Objective 1 – Improve Health & Wellbeing																			

Objective 2 – Enhance Biodiversity & Increase Ecosystem Resilience

3.3.11 Contributing to enhancing biodiversity and increasing ecosystem resilience in Monmouthshire is a key objective for the GI Strategy.











3.3.12 The GI Strategy’s priorities for increasing biodiversity in Monmouthshire are:

- Improving ecosystem resilience through improved land management for biodiversity.
- Promoting actions that work with a range of partners in Monmouthshire to deliver landscape scale interventions delivering multiple benefits (such as improving the habitat condition and connectivity of natural areas on or between protected sites and sites of importance for nature conservation; natural flood risk management opportunities; woodland creation; climate change adaptation and mitigation; and species specific management).
- Ecosystem services on which the prosperity and well-being of communities in Monmouthshire depend should be safeguarded and enhanced by an integrated approach to management of natural resources (as advocated by the GI Action Plan for Pollinators in South East Wales and Bee Friendly Monmouthshire's Hedgerow Manifesto).
- Increase opportunities for people to engage and reconnect with the intrinsic and cultural value of nature in Monmouthshire to provide health and well-being benefits.

3.3.13 This objective contributes towards National Wellbeing Goal 2 (creating ‘A Resilient Wales’ in respect of maintaining a biodiverse natural environment with healthy functioning ecosystems that support social, economic and ecosystem resilience and the capacity to adapt to change) and Goal 3 (creating ‘A Healthier Wales’ in respect of people’s mental well-being by increasing access to nature).

3.3.14 This objective for enhancing biodiversity and increasing ecosystem resilience also contributes towards Local Wellbeing Objective 3.

3.3.15 This objective contributes towards all of the Monmouthshire Biodiversity and Ecosystem Resilience Forward Plan objectives.

GI Strategy Objective	National Well-being Goals (see Box 3.3)							Local Well-being Objectives (see Box 3.4)				Biodiversity & Resilience Forward Plan Objectives (see Box 3.5)						
	1	2	3	4	5	6	7	1	2	3	4	1	2	3	4	5	6	7
Objective 2 – Enhance Biodiversity & Increase Ecosystem Resilience																		

Objective 3 – Strengthen Landscape Character & Distinctiveness




3.3.16 Contributing to strengthening the landscape character and distinctiveness of Monmouthshire is a key objective for the GI Strategy.

3.3.17 The GI Strategy's priorities for strengthening the landscape character and distinctiveness of Monmouthshire are:

- Improving townscape character and visual amenity through integration of multi-functional greenspace into new development.
- Reinforcing local heritage and cultural identity through place-based solutions.
- Enhancing the distinctive character of Monmouthshire's landscape through an integrated approach to natural resource management (as highlighted in Objective 2).
- Protecting and restoring distinctive historic and semi-natural landscape features.
- Enhancing the condition of degraded landscapes where appropriate.
- Engaging local communities and visitors in appreciating and understanding the cultural and natural influences that shaped the character of the landscape.
- Reinforcing the strong sense of tranquillity, remoteness and wildness found within many places in Monmouthshire that makes a contribution to people's mental well-being.

3.3.18 This objective contributes towards National Wellbeing Goal 6 (creating 'A Wales of Vibrant Culture and Thriving Welsh Language' in respect of promoting and protecting culture, heritage and the Welsh language) and Goal 3 (creating 'A Healthier Wales' in respect of the mental well-being benefits for people from experiencing the special qualities of the Monmouthshire landscape).

3.3.19 This objective for strengthening the landscape character and distinctiveness of Monmouthshire also contributes towards Local Wellbeing Objective 3.

GI Strategy Objective	National Well-being Goals (see Box 3.3)							Local Well-being Objectives (see Box 3.4)				Biodiversity & Resilience Forward Plan Objectives (see Box 3.5)						
	1	2	3	4	5	6	7	1	2	3	4	1	2	3	4	5	6	7
Objective 3 – Strengthen Landscape Character & Distinctiveness																		

Objective 4 – Increase Climate Change Resilience

3.3.20 Contributing to increasing climate change resilience in Monmouthshire is a key objective for the GI Strategy.

3.3.21 The GI Strategy's priorities for increasing climate change resilience in Monmouthshire are:

- Ensuring land and water in Monmouthshire is managed sustainably in an integrated way and reducing the risk from environmental hazards such as flooding and pollution.
- Adapt to and mitigate the potential effects of climate change by enabling Monmouthshire to be more resilient to the risk of flooding, drought and higher urban temperatures.
- Opportunities for local sustainable (small-scale) renewable energy generation and food production in Monmouthshire should be promoted to help mitigate climate change by reducing the area's carbon footprint.
- Consideration of the potential of GI to reduce flood risk through the restoration of natural flood plains and the increased use of sustainable drainage systems/rain gardens in urban areas.
- Promoting opportunities to improve ecological connectivity to support biodiversity.

3.3.22 This objective contributes towards National Wellbeing Goal 2 (creating 'A Resilient Wales' in respect of maintaining healthy functioning ecosystems that support social, economic and ecological resilience and the capacity to adapt to climate change) and Goal 7 (creating 'A Globally Responsive Wales' in respect of making a positive contribution to global well-being by helping address the challenges of climate change locally).

3.3.23 This objective for increasing climate change resilience in Monmouthshire also contributes towards Local Wellbeing Objective 3.

GI Strategy Objective	National Well-being Goals (see Box 3.3)							Local Well-being Objectives (see Box 3.4)				Biodiversity & Resilience Forward Plan Objectives (see Box 3.5)							
	1	2	3	4	5	6	7	1	2	3	4	1	2	3	4	5	6	7	
Objective 4 – Increase Climate Change Resilience																			

Objective 5 – Support Sustainable Economic Development

3.3.24 Contributing to supporting sustainable economic development in Monmouthshire is a key objective for the GI Strategy.

3.3.25 The GI Strategy’s priorities for supporting sustainable economic development in Monmouthshire are:

- Promoting the sustainable use of natural resources to support Monmouthshire’s local green economy and develop skills and learning.
- Promoting actions that bring partners together to work with businesses in Monmouthshire to develop opportunities for delivering ecosystem services; improve resource efficiency and reduce energy consumption; identify opportunities and facilitate the sharing of resources between businesses; and re-localise the supply chain.
- Creating opportunities for new businesses/income generation, skills development and job creation in Monmouthshire from environmental land management and conservation, tourism and green technologies.
- Investing in the maintenance and enhancement of greenspaces and other GI assets that contribute to the environmental quality and distinctiveness of Monmouthshire's landscapes and settlements, helping attract and retain inward investment.

- Capitalise on the ability of ecosystems services provided by GI assets to alleviate local social and economic issues in Monmouthshire such as management of flood risk.
- Making appropriate provision for GI in the masterplanning of new developments in Monmouthshire that meets local needs, and is well designed and constructed to high environmental sustainability standards.
- Promoting the economic value of our public rights of way network/green corridors as an important investment in the future for the residents and visitors of Monmouthshire.

3.3.26 This objective contributes towards National Wellbeing Goal 1 (‘A Prosperous Wales’ in respect of creating an innovative, productive and low carbon society, developing a skilled and well-educated workforce and generating wealth and employment opportunities).

3.3.27 This objective for supporting sustainable economic development in Monmouthshire also contributes towards Local Wellbeing Objective 4.

GI Strategy Objective	National Well-being Goals (see Box 3.3)							Local Well-being Objectives (see Box 3.4)				Biodiversity & Resilience Forward Plan Objectives (see Box 3.5)						
	1	2	3	4	5	6	7	1	2	3	4	1	2	3	4	5	6	7
Objective 5 – Support Sustainable Economic Development	£										£							

3.4 Monmouthshire's Strategic GI Network

3.4.1 The Strategic GI Network for Monmouthshire is illustrated conceptually on **Diagram 3.1**. The Strategic GI Network provides an overarching framework for GI planning, management and delivery across the County as an integral part of the wider Gwent Green Grid. The network embraces strategic GI corridors connecting GI assets within the County and in neighbouring areas, providing important GI links to Monmouthshire's main settlements.

3.4.2 Drawing on the detailed assessment set out in **Appendix D3**, this section provides an overview of the strategic needs and opportunities for restoring, maintaining, creating and/or connecting GI assets to help strengthen Monmouthshire's Strategic GI Network for the future.

Strategic GI Corridors:

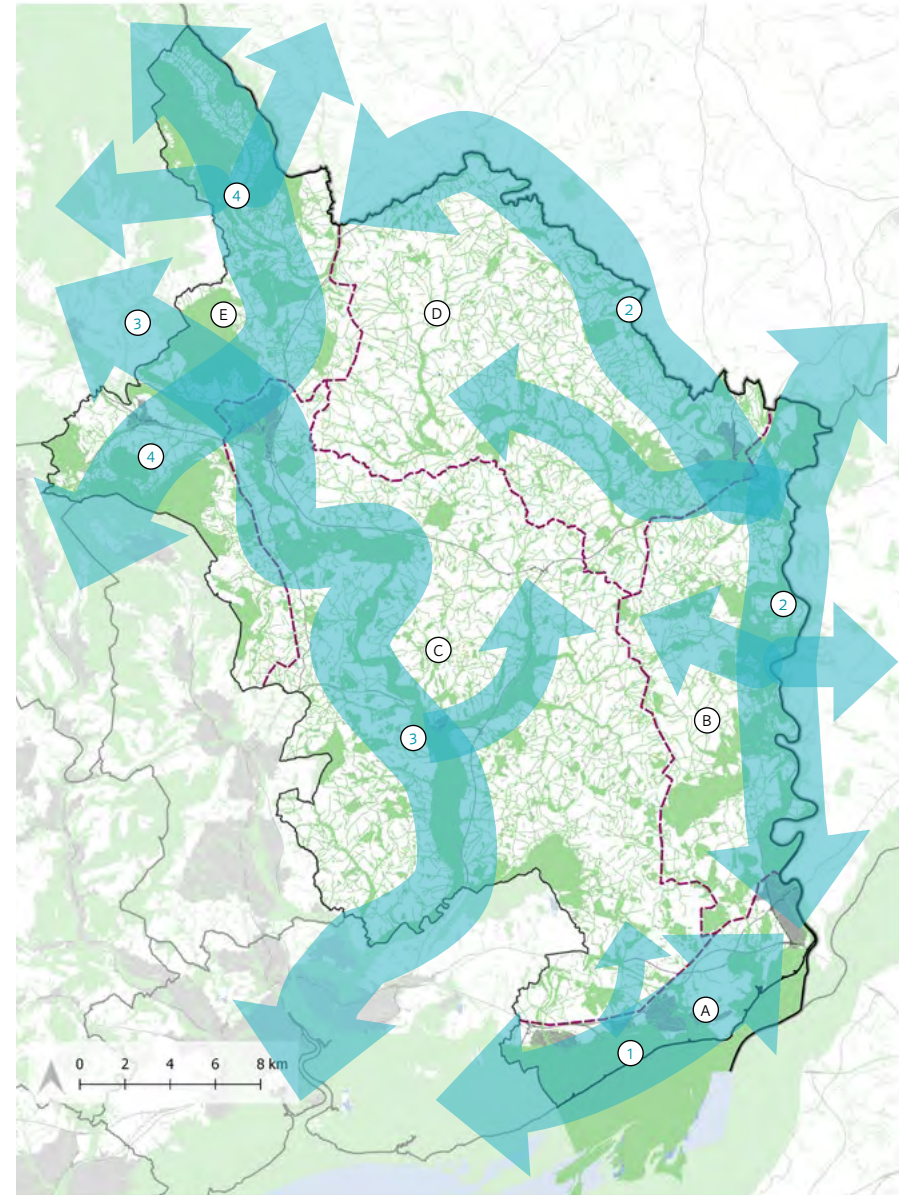
- 1: Gwent Levels/Coast
- 2: Wye Valley & Tributaries
- 3: Usk Valley & Tributaries
- 4: Brecon Beacons Uplands

GI Zones:

- A: Gwent Levels
- B: Wye Valley
- C: Usk Catchment
- D: Wye Catchment
- E: Brecon Beacons Uplands

 Existing GI Network

DIAGRAM 3.1 Monmouthshire's Strategic GI Network



GI Needs & Opportunities for Improving Health & Wellbeing

3.4.3 The County is generally well provided for in terms of accessible greenspace provision. However, there is an overarching **need** to enhance the connectivity of accessible greenspaces within the Strategic GI Network by improving access linkages, particularly to settlements; and to improve interpretation and promotion of existing assets, widening access to those who could most benefit from the County's accessible GI assets such as people with mental well-being challenges (particularly dementia) and physical/visual impairments.

3.4.4 The strategic GI **opportunities** in relation to improving the health and well-being of communities in Monmouthshire are:

- Reviewing and addressing gaps in and accessibility to the public rights of way network, particularly around settlements and their adjacent accessible greenspaces.
- Promoting existing accessible assets to ensure those who would most benefit from access to greenspaces can do so.
- Improving interpretation for existing accessible green infrastructure assets.
- Reviewing, improving and creating new health walks around the County and making rights of way accessible as possible to all as opportunities arise.
- Reconnecting people with nature through improved promotion and facilitation of volunteer/'Friends of' groups.
- Tree planting to improve air quality.

GI Needs & Opportunities for Enhancing Biodiversity & Increasing Ecosystem Resilience

3.4.5 The County is generally well provided for in terms of natural greenspace and habitats. However, there is an overarching **need** to reverse the erosion and fragmentation of natural and semi-natural habitats in Monmouthshire, in order to reduce biodiversity loss, provide resilience to climate change and provide greater access to nature within the Strategic GI Network.

3.4.6 The strategic GI **opportunities** in relation to enhancing biodiversity and increasing ecosystem resilience in Monmouthshire are:

- Restoring or enhancing existing assets and habitats providing management recommendations or support where habitats have been degraded.
- Encouraging the appropriate management of publically owned land, to include where possible the creation, restoration and connectivity of flower-rich habitats to support and sustain pollinating insects.
- Where opportunities exist, promoting the benefits of high nature-value farming.
- Reconnecting people with nature via traditional and non-traditional education approaches.
- Maximising biodiversity benefits of projects through project design, retention of semi-natural habitats and long-term management for biodiversity.
- Identifying and promoting ecological connectivity in the landscape and utilising biodiversity opportunity mapping tools such as Buglife's Bee Lines.

GI Needs & Opportunities for Strengthening Landscape Character & Distinctiveness

3.4.7 There is an overarching **need** to promote high quality design of new development to enhance the integrity and local distinctiveness of the County's landscapes and townscapes, and to encourage appropriate management of woodlands and grasslands that are of particular importance in defining the character of the County. There is also a need to understand, conserve and enhance the historic environment, which contributes significantly to landscape character in Monmouthshire.

3.4.8 The strategic GI **opportunities** in relation to strengthening the landscape character and distinctiveness of Monmouthshire are:

- Encourage effective place-making, supporting high standards of design, materials, energy efficiency, drainage and landscaping in all developments, to ensure that they complement and enhance the local landscape character and distinctiveness including scale and setting and minimise the impact on the natural environment. This should help to create more sustainable and resilient communities.
- Manage and maintain as appropriate the natural and semi-natural habitats that make Monmouthshire distinctive, including woodlands and grasslands.
- Researching, conserving and enhancing the historic environment and conserving archaeology.

GI Needs & Opportunities for Increasing Climate Change Resilience

3.4.9 There is an overarching **need** to manage the water environment appropriately, to ensure biodiversity, flood management, water and soil quality are maintained and enhanced in a changing climate.

3.4.10 The strategic GI **opportunities** in relation to increasing climate change resilience in Monmouthshire are:

- Working in partnership with Dŵr Cymru Welsh Water (DCWW) and NRW, to achieve better flood risk management that reflects GI objectives.
- Increasing the use of SuDS and river buffer zones, helping to hold water back in the catchment and therefore helping to reduce runoff and flood risk.
- Increasing the use of SuDs in new developments where appropriate through implementation of Schedule 3 to the Flood and Water Management Act 2010, which establishes SuDS Approving Bodies (SABs) in local authorities and sets a statutory standard for the design, construction, operation and maintenance of SuDS.
- Improve land management to benefit soils (for example, reducing frequency of grass cutting).

GI Needs & Opportunities for Supporting Sustainable Economic Development

3.4.11 There is an overarching **need** to support a sustainable farming and tourism industry, and appropriate sustainable housing development, in Monmouthshire in ways that deliver the supporting, regulating, provisioning and cultural services essential to the functioning of ecosystems.

3.4.12 The strategic GI **opportunities** in relation to supporting sustainable economic development in Monmouthshire are:

- Providing public benefits in the countryside through farming, working with farmers to support and advise them in sustainable agricultural practices, and appropriate changes to farm practices where necessary.
- Developing a coherent approach to the sustainable management of natural resources, including diversified agricultural land uses and increased renewable energy generation.
- Encouraging and supporting local producers to supply local food and to promote and encourage the use of local produce by public bodies, consumers, accommodation providers and local food outlets.
- Encouraging and supporting the development of the local green economy.
- Supporting actions which improve the image of places, especially with regard to the design of new development, being aware that inward investment is captured by attractive and diverse settings, and that property values can be boosted through proximity to green space.



4

Settlement Green Infrastructure Networks



4.1 Introduction

4.1.1 Development in Monmouthshire over the LDP period 2011-2021 is focussed in and around the following settlements (see **Diagram 4.1**).

Key Growth Locations:

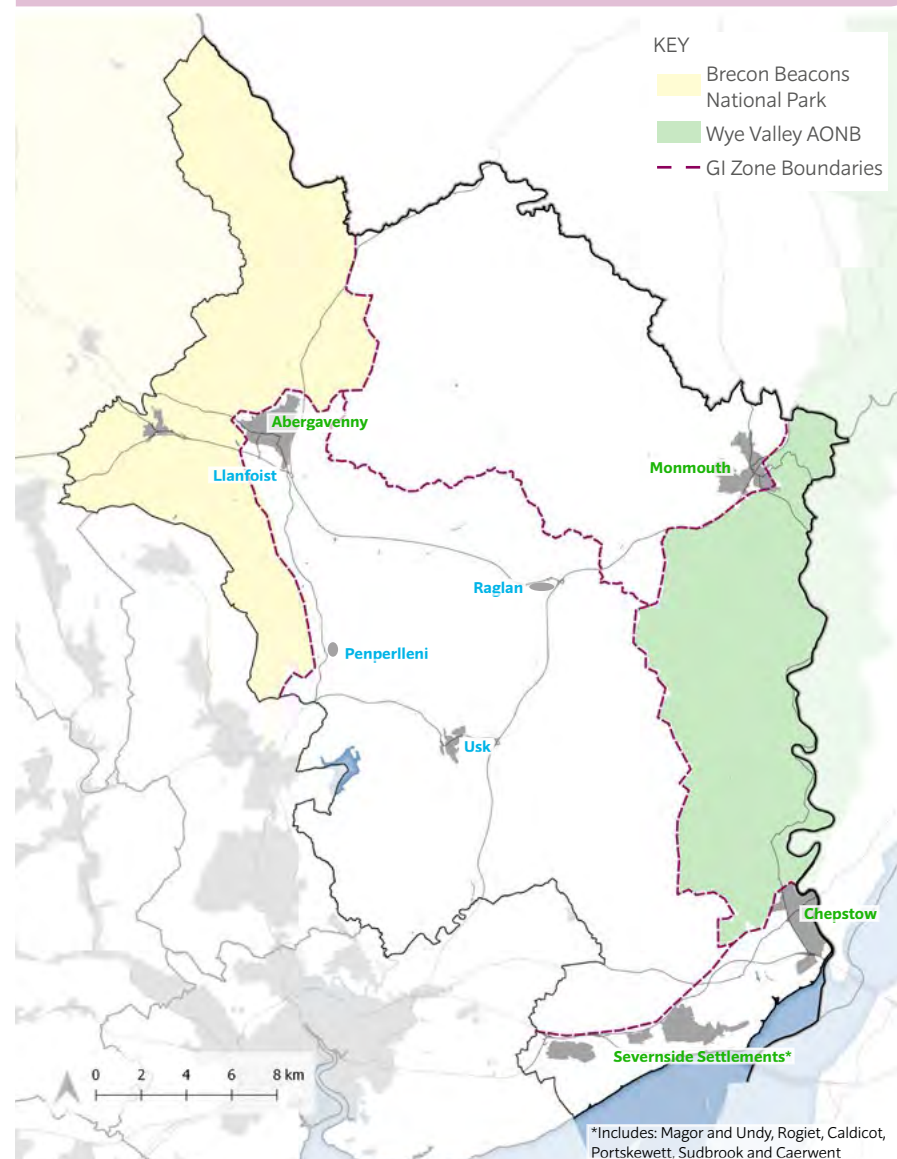
- Abergavenny
- Monmouth
- Chepstow
- Severnside Settlements

Rural Secondary Settlements:

- Llanfoist
- Usk
- Raglan
- Penperlleni

4.1.2 Set within the context of the Strategic GI Network for Monmouthshire illustrated on **Diagram 3.1**, the key opportunities for strengthening the GI Networks in and around the above settlements are highlighted in this section. Where appropriate, these opportunities are carried forward into the projects set out in the GI Delivery Plan (Volume 2).

DIAGRAM 4.1 Key Growth Locations and Rural Secondary Settlements



4.2 Abergavenny & Llanfoist

GI Assets

4.2.1 The existing GI assets that provide the GI network in and around the settlements of Abergavenny & Llanfoist are shown on the GI Network Plan (see **Diagram 4.2**).

4.2.2 Abergavenny is a distinctive historic market town nestled within the Usk Valley, immediately outside the Brecon Beacons National Park's eastern boundary. Its town centre is a conservation area containing many listed buildings, including the ruins of the Norman Abergavenny Castle. Together with nearby Llanfoist, it is overlooked and sheltered by the Blorenges and the Sugar Loaf mountains, located to the south-west and north-west respectively. The Blaenavon Industrial Landscape World Heritage Site stretches to the south-west.

4.2.3 Other key GI assets include:

- The River Usk (also a SAC) and its floodplain (to the south of Abergavenny), which includes accessible natural greenspaces such as Castle Meadows.
- The River Gavenny which flows through Abergavenny and the Monmouthshire and Brecon Canal situated to the south of Llanfoist.
- Historic parks/gardens including Bailey Park within Abergavenny, Abergavenny Priory Deer Park to the north and Coldbrook House to the south-east.
- Public Rights of Way and the Usk Valley Walk long distance path.
- Partly accessible woodlands such as Twyn-yr-allt and Deri-fach (also designated as SSSI and SAC) to the north and Coed-y-person to the south (designated as a SSSI).



GI Opportunities

4.2.4 Key opportunities for strengthening the GI network in and around the settlements of Abergavenny/Llanfoist through the restoration, maintenance, creation or connection of existing GI assets are also shown on the GI Network Plan (see **Diagram 4.2**). The key GI opportunities that would deliver the most significant benefits for people and wildlife are considered to be¹:

1. Strengthen the A465 and railway corridor, ensuring tree line and hedgerows are well connected and sensitively managed.
2. Improve the ecological quality and value of the green corridor adjacent to the River Usk.
3. Create and enhance links between the River Usk, River Gavenny, A465, A4143 and railway corridors with the semi-natural habitats around Llanfoist, including connections between development at Grove Farm and the nearby SINC, the Monmouthshire and Brecon Canal and the ancient woodlands.
4. Integrate trees in open green (grassed) space where appropriate² within the Abergavenny Conservation Area.
5. Understand the significance of the culverts on the River Gavenny and the smaller watercourses e.g. the Afon Cibi, as barriers to wildlife dispersal and explore potential options for reducing their fragmentary effects.
6. Form or strengthen ecological links between The Hill site and the Sugar Loaf ancient woodlands
7. Form or strengthen ecological links between the River Gavenny railway corridor and the woodland and watercourse near St Teilo's vicarage.
8. Enhance ecological connectivity between sections of the Afon Cibi in central Abergavenny with the trees and watercourse of Bailey Park, which itself could be better connected to the River Gavenny to its east.
9. Form or strengthen ecological links between patches of trees in and around The Knoll and Nevill Hall Hospital and also to the Nant Iago to the west, the A4143 corridor to the east and a block of woodland, semi-improved grassland and a small tributary of the River Usk to the south.

1 See Monmouthshire Open Space Study, Greenspace Study and Ecological Connectivity Assessments for more details

2 See Abergavenny Conservation Area Appraisal & Management Proposals (2016) for more details

10. Increase access to rights of way and greenspaces between Abergavenny and Llanfoist that are currently not accessible.

4.2.5 Other general GI opportunities are:

- Improve the quality and value of the natural and semi-natural greenspace sites within Abergavenny, which at present is variable.
- Ensure sensitive management of grassland verges.
- Ensure hedgerows are sensitively managed and well-connected.
- Ensure blocks of semi-natural habitat and protected sites are sensitively managed and their extent increased where appropriate.
- Improve the quality of amenity greenspace in Abergavenny.
- Improve the quality and value of churchyards & cemeteries.
- Strengthen the major river corridors through Abergavenny. Ensure a buffer of semi-natural habitat with adjacent fields and the built landscape and where possible improve connectivity to nearby areas of semi-natural habitat. Consider improvements to the Usk Valley Walk.
- Enhance connectivity between the small patches of habitats in Abergavenny and distributed across the settlement. For example, linking the woodland and semi-improved grassland of Maindiff Court Hospital with the railway-A465 corridor to its north and west.
- Management of community spaces by 'friends of', or similar groups.
- Street tree planting in areas where losses have occurred, especially in the Conservation Area
- Tree planting in low value amenity space, including species for community orchards and pollinators.
- Interpretation to identify links and loops from key sites
- Identify opportunities to implement SuDS systems, where appropriate, to help improve water quality

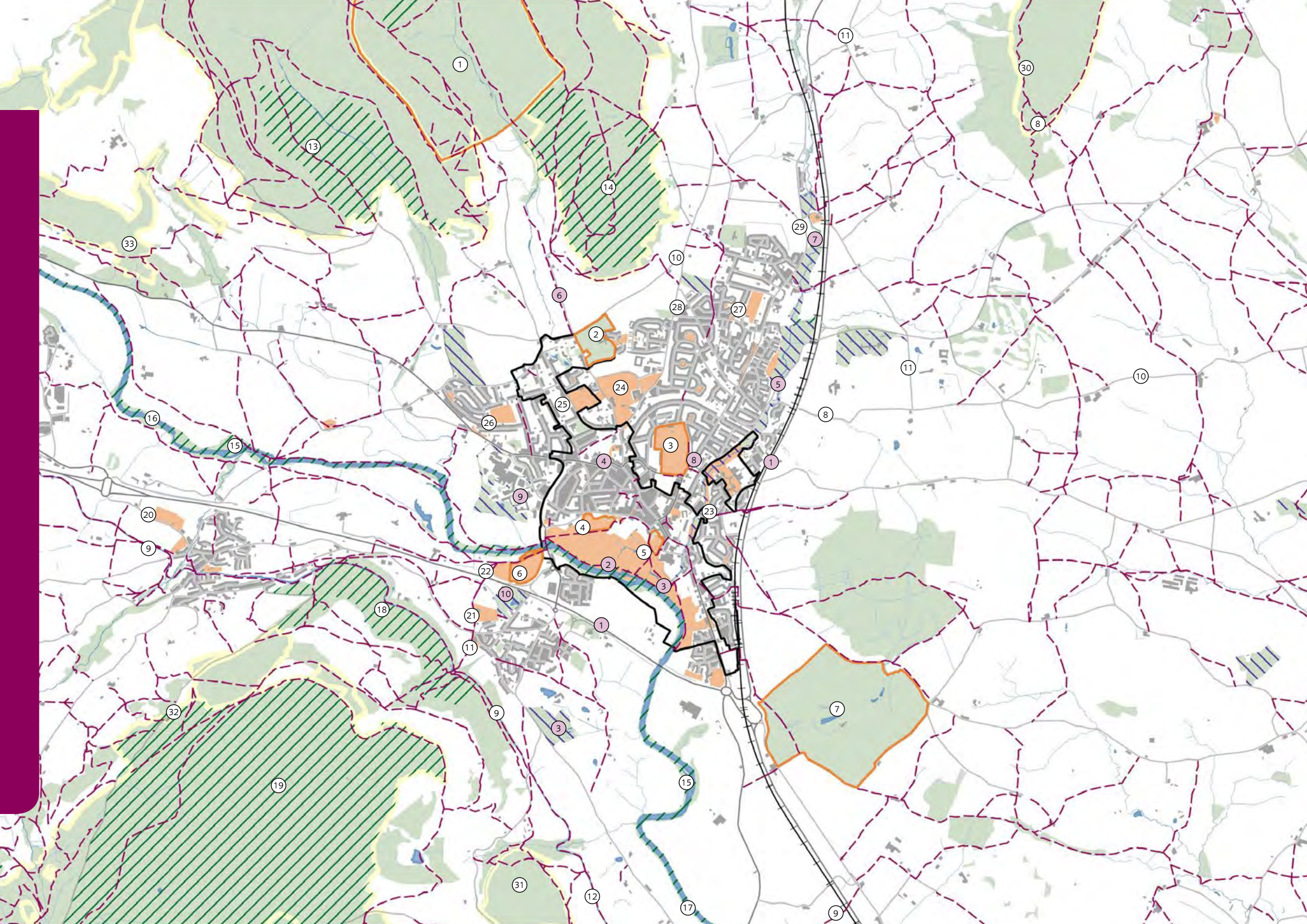


DIAGRAM 4.2 Abergavenny & Llanfoist GI Network Plan

GI Assets

-  Natural or Semi-natural Greenspace
-  Statutory Biodiversity Designations
-  Sites of Interest for Nature Conservation
-  Watercourses/Waterbodies
-  Historic Parks & Gardens
-  Conservation Area
-  Public Open Space
-  Country Park
-  Open Access Land (CRoW Act)
-  Public Right of Way

Statutory Biodiversity Designations

13. Sugar Loaf Woodlands (Deri-fach Woodland) SAC & SSSI
14. Sugar Loaf Woodlands (Twyn-yr-Allt Woodland) SAC & SSSI
15. River Usk SAC
16. River Usk (Upper Usk)/Afon Wysg (Wysg Uchaf) SSSI
17. River Usk (Lower Usk)/Afron Wysg (Wysg Isaf) SSSI
18. Coed-y-person SSSI
19. Bloreng/Blorens SSSI

Historic Parks & Gardens

1. Abergavenny Priory Deer Park
2. The Hill
3. Bailey Park
4. Linda Vista Gardens
5. Abergavenny Castle
6. New Cemetery
7. Coldbrook House

Public Open Space

20. King George's Playing Field
21. Llanfoist/Llan-ffwyst Playing Field
22. Llanfoist/Llan-ffwyst Cemetery
23. St Mary's Church
24. Pen-y-pound (Football Ground, Sports Ground & Playing Field)
25. Cricket Ground
26. Cresta Road Recreation Ground
27. Mardy Recreation Ground
28. Playing Field on Old Hereford Road
29. St Teilo's Church with Bettws Chapel

Open Access Land (CRoW Act)

19. Bloreng/Blorens
13. Deri-fach Woodland
14. Twyn-yr-allt Woodland
30. Ysgyryd Fawr
31. Ffwd Wood
32. Woodland near to Coedytwyn
33. Graig

Promoted Routes

8. Beacons Way (Brecon)
9. Usk Valley Walk
10. Sustrans National Cycle Network Route 42
11. Sustrans National Cycle Network Route 46
12. Sustrans National Cycle Network Route 49

GI Opportunities

- ① Green Infrastructure Opportunities - see text for details

4.3 Monmouth

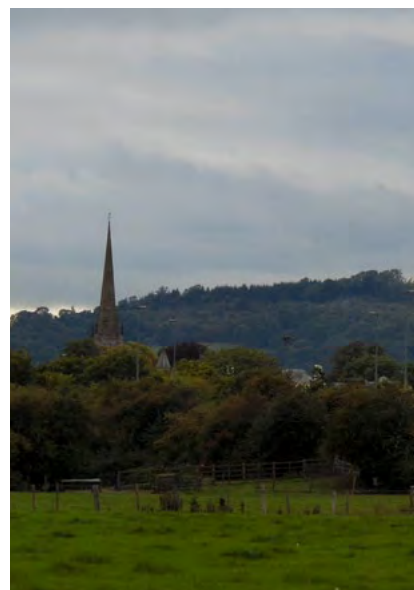
GI Assets

4.3.1 The existing GI assets that provide the GI network in and around Monmouth are shown on the GI Network Plan (see **Diagram 4.3**).

4.3.2 The market town of Monmouth is situated at the confluence of the Rivers Monnow, Trothy and Wye, close to the Welsh border and adjacent to the Wye Valley AONB's western edge. The town's castle, listed buildings, Norman bridge and Roman roads, all reflect its historic value. It is overlooked and sheltered by a number of partly accessible woodlands including Buckholt Wood, Hayes Coppices and Kingswood.

4.3.3 Other key GI assets include:

- Fiddler's Elbow National Nature Reserve (to the east) and Wonastow SINC.
- Accessible natural greenspace sites such as the Chippenham Recreational Ground in the centre of Monmouth, Vauxhall Fields, the Claypatch Wood, and the Millennium Field/allotment site adjacent to the River Wye.
- Public Rights of Way, included the promoted Wysis Way and Peregrine Path, and the Offa's Dyke Path National Trail and Wye Valley Walk long distance path. There are also a number of locally promoted circular walks.



GI Opportunities

4.3.4 Key opportunities for strengthening the GI network in and around Monmouth through the restoration, maintenance, creation or connection of existing GI assets are also shown on the GI Network Plan (see **Diagram 4.3**). The key GI opportunities that would deliver the most significant benefits for people and wildlife are considered to be:

1. Improve provision and access to natural and semi-natural greenspace, particularly to the north of the town.
2. Ensure tree lines and hedgerows are well connected and sensitively managed, and ensure sensitive management of grassland verges along the A40 corridor.
3. Improve both ecological and pedestrian/cycle linkages of the disused viaduct with other nearby semi-natural habitats to further bolster corridors through the settlement.
4. Form ecological links between the central extensive green corridor dominated by the Rivers Wye and Monnow and other smaller habitat corridors (such as the Watery Lane watercourse, semi-improved grassland and ancient woodlands to the west of the settlement).
5. Form ecological links between the ditch, semi-improved grassland and woodland habitat in and around Wonastow Industrial estate.
6. Form ecological links between the northern tip of the Clawdd du ditch and the Wonastow road ditch, as well as improving connectivity between these sections of ditch and Drybridge pond and the 'fire station woodland' to the north.
7. Form ecological links between the western end of the Wonastow Road ditch and semi-improved grassland and St Dial's wood to the south. Opportunity to increase access to the MCC owned part of St. Dials Wood.
8. Form ecological links between Wonastow Field SINC and the ditch and

semi-improved grassland to the south and Watery Lane to the north.

9. Improve and extend the Wye Valley Walk to make it accessible all the way from the Boat House to the Church.

4.3.5 Other general GI opportunities are:

- Form links between the variety of small additional habitat patches scattered across the settlement.
- Improve the quality and value of open spaces in Monmouth.
- Improve the quality and value of natural and semi-natural greenspace sites in Monmouth.
- Ensure a buffer of semi-natural habitat with adjacent fields and the built urban landscape; and connect with near-by areas of semi-natural habitat where possible along the major river corridors. Extend this to include smaller watercourses, many of which are culverted through the residential zones of Monmouth.
- Ensure hedgerows are sensitively managed and well-connected.
- Ensure current blocks of semi-natural habitat and protected sites are sensitively managed and their extent increased where feasible or appropriate.
- Carry out works to prevent the loss of the Wye Valley Walk to bank and flood erosion along the Wye, whilst protecting sensitive habitats.
- Management of community spaces by 'friends of', or similar groups.
- Street tree planting in areas where losses have occurred, especially in the Conservation Area
- Tree planting in low value amenity space, including species for community orchards and pollinators.
- Improve pedestrian links between Wyesham and Monmouth.
- Interpretation to identify links and loops from key sites such as Chippenham Field.

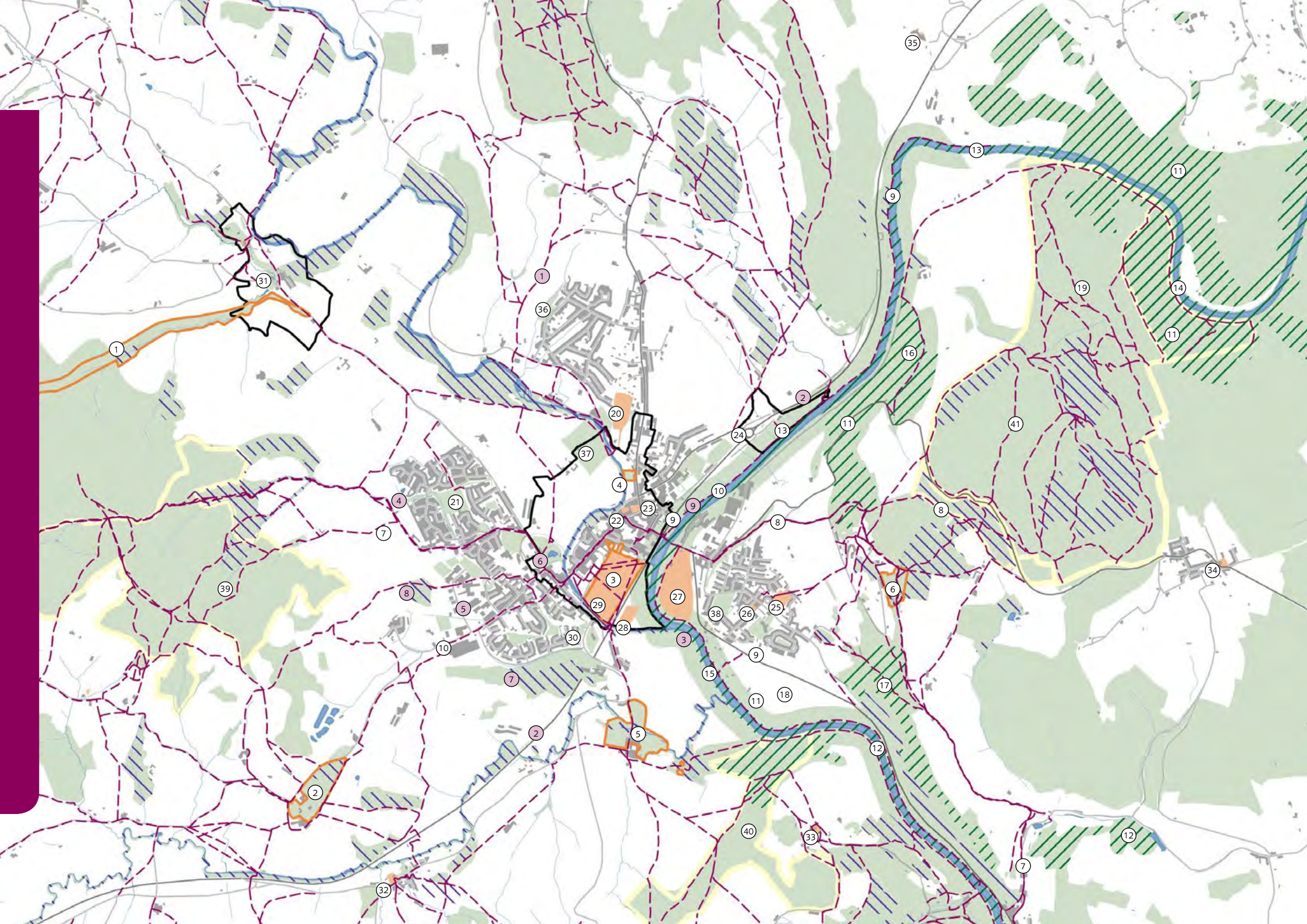


DIAGRAM 4.3 Monmouth GI Network Plan

GI Assets

-  Natural or Semi-natural Greenspace
-  Statutory Biodiversity Designations
-  Sites of Interest for Nature Conservation
-  Watercourses/Waterbodies
-  Historic Parks & Gardens
-  Conservation Area
-  Public Open Space
-  Country Park
-  Open Access Land (CRoW Act)
-  Public Right of Way

Statutory Biodiversity Designations

11. Wye Valley Woodlands/Coetiroedd Dyffryn Gwy (Wales) SAC
12. Wye Valley Woodlands (England) SAC
13. River Wye/Afon Gwy (Wales) SAC
14. Upper Wye Gorge SSSI
15. River Wye (Lower Wye)/Afon Gwy (Gwy Isaf) SSSI
16. Fiddler's Elbow SSSI & National Nature Reserve
17. Harper's Grove-Lord's Grove SSSI
18. Livox Wood SSSI
19. Lady Park Wood National Nature Reserve (& Other Stat Access Land)

Historic Parks & Gardens

1. The Hendre, Llangattock-vibon-Avel
2. Wonastow Court
3. Chippenham Recreation Ground
4. Chapel House, Monmouth
5. Troy House, Monmouth
6. The Kymin

Public Open Space

20. Osbaston Cemetery
21. Rockfield Recreation Ground
22. St Mary's Church, Monmouth
23. Sports Facility
24. St Peter's Church, Monmouth
25. Playing Field, Wyesham
26. St James's Church, Wyesham
27. Sports Field
28. Allotments
29. Chippenham Recreation Ground & Sports Ground
30. Elstob Way Play Space
31. St Cenedlon's Church, Rockfield
32. St Michael's Church, Mitchel Troy
33. Penallt Old Church, Penallt
34. Other Sports Facility
35. St Swithin's Church, Gararew

Other Open Spaces

36. Lancaster Way Open Space
37. Vauxhall Field Amenity Green Space
38. Wyesham Road Community Woodland

Open Access Land (CRoW Act)

19. Lady Park Wood National Nature Reserve
39. Kings Wood
40. Livox Wood, Troypark Wood, Troy Orles and Church Hill Common
41. Lady Park Wood NNR & Highmeadow Woods (including Redding's Inclosure)

Promoted Routes

7. Offa's Dyke Path National Trail
8. Wysis Way
9. Wye Valley Walk
10. Sustrans National Cycle Network Route 423

GI Opportunities

- ① Green Infrastructure Opportunities - see text for details

4.4 Chepstow

GI Assets

4.4.1 The existing GI assets that provide the GI network in and around Chepstow are shown on the GI Network Plan (see **Diagram 4.4**).

4.4.2 The historic market town of Chepstow, once a wealthy port, is located on steeply sloping land at the mouth of the Wye Valley, immediately adjacent to the southern edge of the Wye Valley AONB. The historic core of the town is centred around the castle, which overlooks the River Wye. The Wye meanders past Chepstow's eastern edge, eventually merging with the River Severn/Severn Estuary (designated as a SSSI, SPA, SAC and Ramsar) directly to the south of the town. Accessible woodlands including St Pierre's Great Wood and Great Barnets Wood are located to the west/north-west of the town.

4.4.3 Other key GI assets include:

- Accessible natural greenspaces within the town such as Warren Slade and Park Redding Woods and Bulwark Road Open Space.
- Public Rights of Way and the Offa's Dyke Path National Trail, Wye Valley Walk long distance path and Wales Coast Path.
- Piercefield Park, a designated historic park/garden to the north of Chepstow. Although mainly in private ownership, it is partly accessible by rights of way and an access agreement.



GI Opportunities

4.4.4 Key opportunities for strengthening the GI network in and around Chepstow through the restoration, maintenance, creation or connection of existing GI assets are also shown on the GI Network Plan (see **Diagram 4.4**). The key GI opportunities that would deliver the most significant benefits for people and wildlife are considered to be:

1. Improve accessible greenspace access through opportunities generated by the large new development adjacent to the River Wye.
2. Improve accessible greenspace access for the centre of Chepstow adjoining the River Wye, where access to the river is limited.
3. Form or strengthen ecological links between the discrete groups of trees/ woodland scattered in and around Hardwick with one another
4. Form or strengthen ecological links between Parc Penterry grassland SINC to the north-west and Beaufort Quarry wood to the south east.
5. Form or strengthen ecological links between Parc Penterry SINC and Cockshoot Wood to its north west via enhanced connectivity with a strip of additional habitat patches (semi-improved grassland and trees) located mid-way between the two main habitat blocks.
6. Form or strengthen ecological links between Cockshoot Wood and Fryth Wood to its north.
7. Form or strengthen ecological links between Chepstow Racecourse grassland SINC to include additional patches of semi-improved grassland to the east and west, and beyond to the River Wye woodland corridor to the east and Fryth Wood to the west.
8. Form or strengthen ecological links between groups of trees/woodland patches near the outskirts of Chepstow town, and the railway and River corridor.
9. Consider landscape mitigation of parking by increasing tree planting where appropriate in the Chepstow Conservation Area¹.

¹ See Chepstow Conservation Area Appraisal & Management Proposals (2016) for more details

4.4.5 Other general GI opportunities are:

- Improve the quality and value of amenity greenspaces in Chepstow.
- Where appropriate, improve the quality of natural and semi-natural greenspace sites in and around the town.
- Improve the quality and value, where appropriate, of the cemeteries and churchyards in Chepstow.
- Strengthen the railway and motorway corridors, ensuring tree lines and hedgerows are well connected and sensitively managed.
- Ensure sensitive management of grassland verges.
- Ensure hedgerows are sensitively managed and well-connected with the wider hedgerow network and other semi-natural habitat features.
- Ensure blocks of semi-natural habitat and protected sites are sensitively managed and their extent increased where appropriate.
- Ensure ditches are sensitively managed.
- Ensure a buffer of semi-natural habitat with adjacent fields and the built urban landscape and connect with near-by areas of semi-natural habitat where possible along the River Wye corridor.
- Management of community spaces by 'friends of', or similar groups
- Street tree planting in areas where losses have occurred, especially in the Conservation Areas.
- Tree planting in low value amenity space, including species for community orchards and pollinators.
- Interpretation to identify links and loops from key sites.
- Tree planting to improve air quality

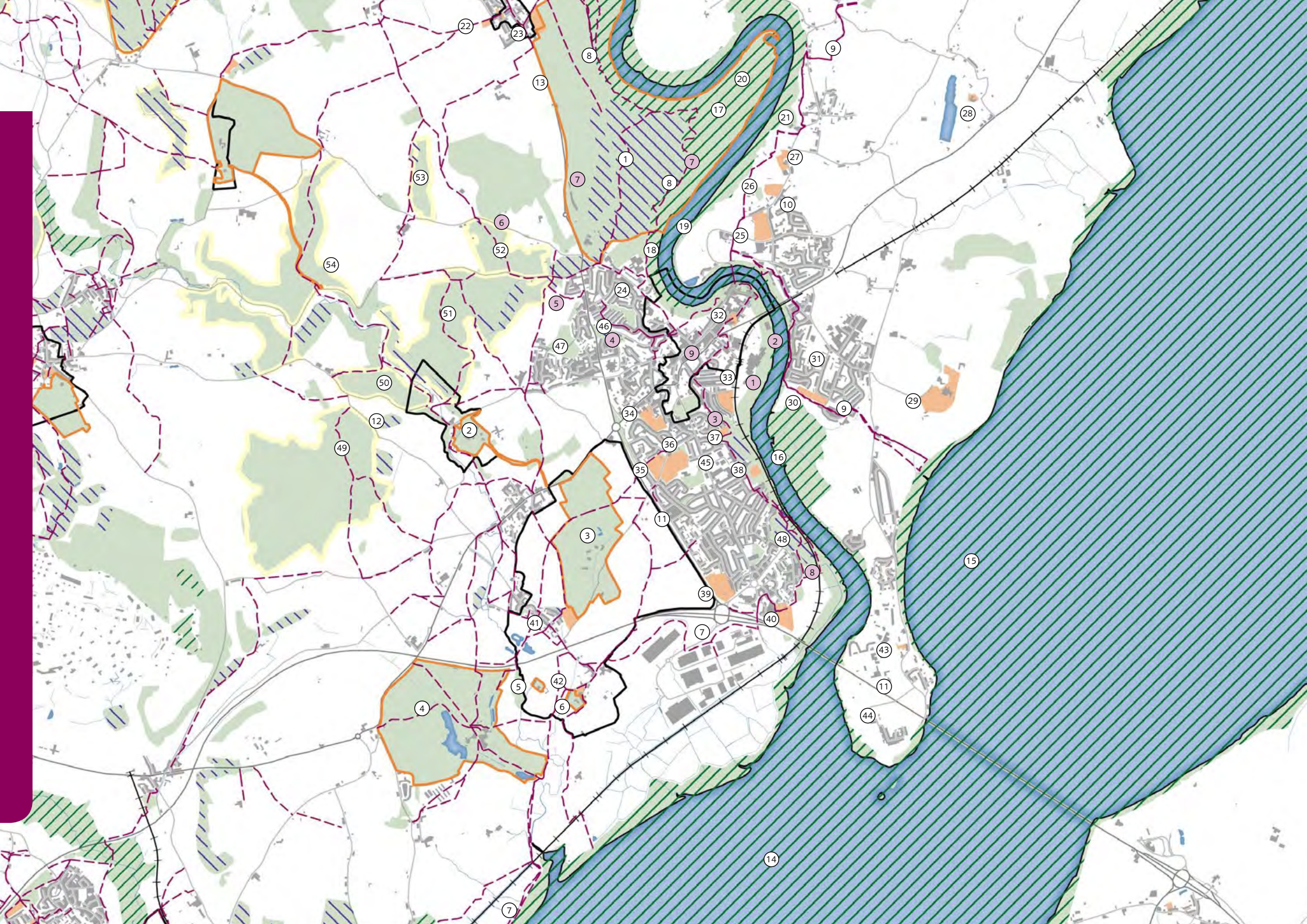


DIAGRAM 4.4 Chepstow GI Network Plan

GI Assets

-  Natural or Semi-natural Greenspace
-  Statutory Biodiversity Designations
-  Sites of Interest for Nature Conservation
-  Watercourses/Waterbodies
-  Historic Parks & Gardens
-  Conservation Area
-  Public Open Space
-  Country Park
-  Open Access Land (CRoW Act)
-  Public Right of Way

Statutory Biodiversity Designations

14. Severn Estuary Wales SPA/SAC/SSSI/Ramsar
15. Severn Estuary (England) SPA/SAC/SSSI/Ramsar
16. River Wye (Lower Wye)/Afon Gwy (Gwy Isaf) SSSI
17. Pierce, Alcove & Piercefield Woods SSSI
18. River Wye (Wales)/Afon Gwy (Wales) SAC
19. River Wye (England) SAC
20. Wye Valley Woodlands/Coetiroedd Dyffryn Gwy (Wales) SAC
21. Wye Valley Woodlands (England) SAC

Historic Parks & Gardens

1. Piercefield Park
2. Mounton House, Mathern
3. Wyelands
4. St Pierre Park
5. Moynes Court, Mathern
6. Mathern Palace

Public Open Space

22. King George's Playing Field
23. Playing Field, St Arvan's
24. Sports Ground & Playing Field, Chepstow Comprehensive School & Leisure Centre
25. Play Space & Playing Field, Coleford Road, Tutshill
26. Recreation Ground, Coleford Road
27. St Luke's Church & Playing Field
28. St Mary's & St Peter's Church, Tidenham
29. Sedbury Park
30. Football Field & Allotments on Buttington Road, Sedbury
31. Play Space, Buttington Road (near Offa's Mead Primary School)
32. St Mary's Church, Chepstow
33. Sports Field, Severn Crescent, (is this Hardwick Playing Pitch in previous study?)
34. Chepstow Town AFC
35. Cemetery, Mathern Road
36. Chepstow Athletic Club
37. Allotments (off Strongbow Road)
38. The Bulwarks
39. Chepstow Rugby Club & Playing Field
40. Playing Field on Tenby Lane

41. Playing Field, Newton Green
42. St Tewdrig's Church, Merthyr Tewdrig/Mathern
43. Religious Grounds, Beachley Barracks
44. Sports Ground, Beachley Point
45. Bulwark Bowl Skate Park, Bulwark Road
46. Huntfield Road Open Space
47. Woolpitch Wood Open Space
48. Warren Slade & Park Redding Woods

Open Access Land (CRoW Act)

49. St Pierre's Great Woods
50. Kite's Bushes/Ticken Hill
51. Great Barnets Wood
52. Cockshoot Wood
53. Brier's Grove
54. Yewtree Wood

Promoted Routes

7. Wales Coastal Path
8. Wye Valley Walk
9. Offa's Dyke Path National Trail
10. Gloucestershire Way
11. Sustrans National Cycle Network Route 4
12. Sustrans National Cycle Network Route 42
13. Sustrans National Cycle Network Route 31

GI Opportunities

- ① Green Infrastructure Opportunities - see text for details

4.5 Severnside Settlements

GI Assets

4.5.1 The existing GI assets that provide the GI network in and around the Severnside Settlements are shown on the GI Network Plan (see **Diagram 4.5**).

4.5.2 The Severnside Settlements (which includes Caerwent, Magor and Undy, Rogiet, Caldicot, Portskewett and Sudbrook) is located immediately north of the Severn Estuary. The latter is designated as a Ramsar, SSSI, SPA and SAC, reflecting the estuary's high nature conservation value. The area comprises a number of woodlands, some accessible (e.g. Thicket Wood and Ifton Great Wood to the north of Rogiet).

4.5.3 Other key GI assets include:

- Nature Reserves such as Magor Marsh.
- The Wales Coast Path, St Tewdrig's Trail, and locally promoted circular walks.
- Accessible natural greenspaces such as Harold Park, Caldicot Castle Country Park, the Nedern Brook Wetlands SSSI and Magor/Undy Gwent Levels SSSI.
- Rogiet Countryside Park and Black Rock.



GI Opportunities

Magor & Undy

4.5.4 Key opportunities for strengthening the GI network in and around Magor and Undy through the restoration, maintenance, creation or connection of existing GI assets are also shown on the GI Network Plan (see **Diagram 4.5**). The key GI opportunities that would deliver the most significant benefits for people and wildlife are considered to be:

1. Improve access to larger greenspaces for the eastern areas of Magor.
2. Strengthen the St Bride's Brook / Mill Reen corridor through the creation / management of semi-natural habitat buffers with adjacent fields and the built urban landscape, and to connect with other near-by areas of semi-natural habitat where possible.
3. Form or strengthen ecological links between Upper Grange grassland SINC with the St Brides Brook to its west, and linking the woodland/semi-improved grassland by Rockfield Farm to the M48 verge corridor to its north, as well as to additional habitat patches (trees/scrub) by Vinegar Hill Farm to its south west.
4. Form or strengthen ecological links between the woodland blocks near Vinegar Hill to each other and to the primary route of connectivity via a connection to woodland to the north, St Bride's.
5. Form or strengthen ecological links between St Bride's Brook / Mill Reen to the west, and the green corridor of the railway to the south.
6. Form or strengthen ecological links between small groups of trees/scrub, as well as linking them to the main routes of connectivity, i.e. the B4245 corridor to the east and woodland strip to the west, in the vicinity of Magor Brewery.

4.5.5 Other general GI opportunities are:

- Improve the quality and value of amenity greenspace in Magor and Undy, where appropriate.
- Improve the quality and value of natural and semi-natural greenspace sites in and around the settlements, where appropriate.
- Improve connectivity to the wider landscape, both in terms of access and ecological connectivity, which is currently limited for Magor and Undy due to the settlements being bounded by roads and railway.
- Strengthen the railway and motorway green corridors, ensuring tree lines and hedgerows are well connected and sensitively managed.
- Ensure sensitive management of grassland verges.
- Identify the significance of culverts as barriers to wildlife dispersal and explore potential options for reducing their fragmentary effects.
- Ensure hedgerows are sensitively managed and well-connected with the wider hedgerow network and other semi-natural habitat features (particularly woodlands).
- Ensure current blocks of semi-natural habitat and protected sites are sensitively managed and their extent increased where appropriate.
- Ensure ditches are sensitively managed.
- Improve routes linking to the Wales Coastal Path for education, and connectivity with landscape, biodiversity and history.
- Management of community spaces by 'friends of', or similar groups.
- Street tree planting in areas where losses have occurred, especially in the Conservation Area.
- Tree planting in low value amenity space, including species for community orchards and pollinators.
- Interpretation to identify links and loops from key sites.

Rogiet

4.5.6 Key opportunities for strengthening the GI network in and around Rogiet through the restoration, maintenance, creation or connection of existing GI assets are also shown on the GI Network Plan (see **Diagram 4.5**). The key GI opportunities that would deliver the most significant benefits for people and wildlife are considered to be:

7. Improve the quality and value of the green corridor in Ifton Lane.
8. Form or strengthen ecological links between the series of small groups of trees stretching north-south between the M48 and the railway corridors to the east of Rogiet.

4.5.7 Other general GI opportunities are:

- Improve the quality and value of smaller amenity greenspace sites in the village.
- Ensure sensitive management of grassland verges.
- Improve connectivity to the wider landscape, both in terms of access and ecological connectivity, which is currently limited for Rogiet as the settlement is bounded by roads and railway.
- Strengthen the railway and motorway corridors, ensuring tree lines and hedgerows are well connected and sensitively managed.
- Ensure hedgerows are sensitively managed and well-connected with the wider hedgerow network and other semi-natural habitat features (particularly woodlands).
- Ensure current blocks of semi-natural habitat and protected sites are sensitively managed and their extent increased where appropriate.
- Ensure ditches are sensitively managed.
- Management of community spaces by 'friends of', or similar groups

- Street tree planting in areas where losses have occurred, especially in the Conservation Area.
- Tree planting in low value amenity space, including species for community orchards and pollinators.
- Interpretation to identify links and loops from key sites.

Caldicot

4.5.8 Key opportunities for strengthening the GI network in and around Caldicot through the restoration, maintenance, creation or connection of existing GI assets are also shown on the GI Network Plan (see **Diagram 4.5**). The key GI opportunities that would deliver the most significant benefits for people and wildlife are considered to be:

9. Improve the quality and value of the natural and semi-natural greenspace site (Caldicot Pill Nature Reserve) adjacent to the town.
10. Strengthen the Nedern Brook corridor, which is the main semi-natural corridor through the settlement, identifying the significance of the culverts as barriers to wildlife dispersal and exploring potential options for reducing their fragmentary effect.
11. Form or strengthen links between the block of woodland and ponds off Dewstow Road (north-west part of the settlement) and the M48 road verge corridor to its south.
12. Form or strengthen links between patches of trees adjacent to the Nedern Brook corridor, north of Caldicot Castle.

4.5.9 Other general GI opportunities are:

- Improve the value of churchyard and cemetery sites in Caldicot.
- Improve connectivity to the wider landscape, both in terms of access and ecological connectivity, which is currently limited for Caldicot as the settlement is bounded by roads and railway.
- Strengthen the railway and motorway corridors: ensure tree lines and hedgerows are well connected and sensitively managed.
- Ensure hedgerows are sensitively managed and well-connected with the wider hedgerow network and other semi-natural habitat features (particularly woodlands).

- Ensure current blocks of semi-natural habitat and protected sites are sensitively managed and their extent increased where appropriate.
- Ensure ditches are sensitively managed.
- Improve the quality and value of amenity greenspaces in Caldicot.
- Ensure sensitive management of grassland verges.
- Management of community spaces by 'friends of', or similar groups.
- Street tree planting in areas where losses have occurred, especially in the Conservation Area.
- Tree planting in low value amenity space, including species for community orchards and pollinators.
- Interpretation to identify links and loops from key sites.

Portskewett and Sudbrook

4.5.10 Key opportunities for strengthening the GI network in and around Portskewett & Sudbrook through the restoration, maintenance, creation or connection of existing GI assets are also shown on the GI Network Plan (see **Diagram 4.5**). The key GI opportunities that would deliver the most significant benefits for people and wildlife are considered to be:

13. Investigate potential access to currently inaccessible greenspaces sites north of Portskewett.
14. Form or strengthen ecological links across the northern half of the settlement, most significantly in relation to the clusters of ASNW SINC's centred on Portskewett Hill, which could be linked to each other and to the railway corridor (to the south), Bushy Close SSSI and Withy Bed woodland (to the east).

4.5.11 Other general GI opportunities are:

- Improve the quality and value of the amenity greenspaces in Portskewett and Sudbrook.
- Improve the quality of the natural and semi-natural greenspaces around the settlements.
- Improve connectivity to the wider landscape, both in terms of access and ecological connectivity, which is limited for Portskewett and Sudbrook as the settlements are bounded in places by roads and railway.
- Strengthen the railway and motorway corridors, ensuring tree lines and hedgerows are well connected and sensitively managed.
- Ensure sensitive management of grassland verges.
- Ensure hedgerows are sensitively managed and well-connected with the wider hedgerow network and other semi-natural habitat features (particularly woodlands).

- Ensure current blocks of semi-natural habitat and protected sites are sensitively managed and their extent increased where appropriate.
- Ensure ditches are sensitively managed.
- Management of community spaces by 'friends of', or similar groups.
- Street tree planting in areas where losses have occurred.
- Tree planting in low value amenity space, including species for community orchards and pollinators.
- Interpretation to identify links and loops from key sites

Caerwent

4.5.12 Key opportunities for strengthening the GI network in and around Caerwent through the restoration, maintenance, creation or connection of existing GI assets are also shown on the GI Network Plan (see **Diagram 4.5**). The key GI opportunities that would deliver the most significant benefits for people and wildlife are considered to be:

15. Develop and manage existing habitat corridors, such as between/through Cross-voel Wood, and Upper and Lower Rodge Wood (SINCs)

4.5.13 Other general GI opportunities are:

- Ensure hedgerows are sensitively managed and well-connected with the wider hedgerow network and other semi-natural habitat features (particularly woodlands).
- Ensure current blocks of semi-natural habitat and protected sites are sensitively managed and their extent increased where appropriate.
- Ensure ditches are sensitively managed.
- Management of community spaces by 'friends of', or similar groups.
- Street tree planting in areas where losses have occurred, especially in the Conservation Area.
- Tree planting in low value amenity space, including species for community orchards and pollinators.
- Interpretation to identify links and loops from key sites.

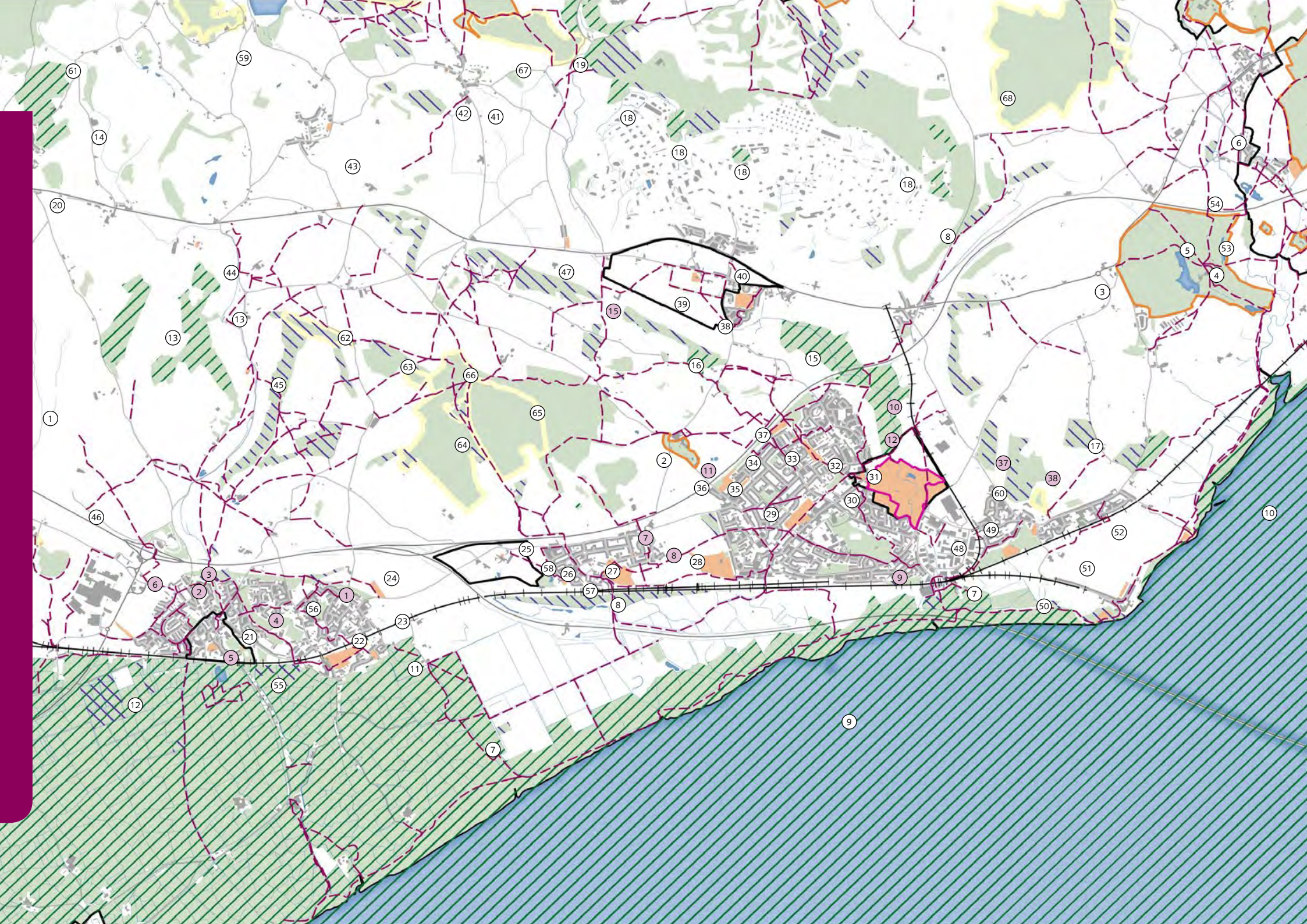


DIAGRAM 4.5 Severnside Settlements GI Network Plan

GI Assets

-  Natural or Semi-natural Greenspace
-  Statutory Biodiversity Designations
-  Sites of Interest for Nature Conservation
-  Watercourses/Waterbodies
-  Historic Parks & Gardens
-  Conservation Area
-  Public Open Space
-  Country Park
-  Open Access Land (CRoW Act)
-  Public Right of Way

Statutory Biodiversity Designations

9. Severn Estuary Wales SPA/SAC/SSSI/Ramsar
10. Severn Estuary England SPA/SAC/SSSI/Ramsar
11. Gwent Levels - Magor & Undy SSSI
12. Gwent Levels - Redwick & Llandeenny SSSI
13. Penhow Woodland SSSI & National Nature Reserve
14. Parc Seymour Woods SSSI
15. Nedern Brook Wetlands SSSI
16. Brockwells Meadows SSSI
17. Bushy Close SSSI
18. Dinham Meadows SSSI
19. Coombe Valley Woods SSSI

Historic Parks & Gardens

1. Pencoed Castle
2. Dewstow House
3. St Pierre Park
4. Mathern Place
5. Moynes Court, Mathern
6. Wyelands

Public Open Space

20. Rockfield Close Recreation Ground
21. St Mary's Church, Magor
22. Playing Field on The Ramp, Undy
23. St Mary's Church, Undy
24. Allotments
25. Religious Grounds, The Old Court, Llanfihangel
26. St Mary's Church, Rogiet
27. Rogiet Playing Fields
28. Caldicott Rugby Club
29. King George's Field, Bowling Green & Allotments
30. Caldicott Leisure Centre Playing Fields
31. Caldicott Castle & Country Park
32. St Mary's Church, Caldicott
33. Playing Fields, St Mary's School, Caldicott
34. Religious Grounds, Nedder Way, Caldecott
35. Playing Fields, Green Lane, Caldecott
36. Cemetery & Allotments, Dewstow Road
37. Allotments
38. Caerwent Playing Fields, St Tathan's Place
39. St Stephen's Church, Caerwent
40. Play Space, Lawrence Crescent, Caer-went
41. Play Space, Llanfair-Discoed
42. St Mary's Church, Llanvair-Discoed
43. Playing Field & St Dubritous Church, Llanvaches
44. St John the Baptist Church, Penhow
45. St Bridget's Church, St Bride's Netherwent

46. St Mary's Church, Wilcrick
47. Playing Field, Trewen
48. Portskewett Recreation Ground
49. St Mary's Church, Portskewett
50. Playing Field & Play Space, Sudbrook
51. Allotments, Sudbrook
52. Black Rock Picnic Site
53. St Tewdrick's Church, Merthyr Twedrig
54. Playing Field, Newton Green

Other Open Spaces

55. Magor Marsh
56. Mill Common
57. Rogiet Countryside Park
58. Starling Close Amenity Greenspace

Open Access Land (CRoW Act)

59. Myndd Alltir-fach (Common Land)
60. Stow Ball Hill (Common Land)
61. Wentwood
62. Coed y Mynydd
63. Upper Seven Acres
64. Thicket Wood
65. Slade Wood
66. Lower Seven Acres
67. Cuhere Wood
68. St Pierre's Great Woods

Promoted Routes

7. Wales Coastal Path
8. Sustrans National Cycle Network Route 4

GI Opportunities

-  Green Infrastructure Opportunities - see text for details

4.6 Usk

GI Assets

4.6.1 The existing GI assets that provide the GI network in and around Usk are shown on the GI Network Plan (see **Diagram 4.6**).

4.6.2 Usk is a rural secondary settlement in the west of Monmouthshire, surrounded by farmland and woodland. The River Usk flows through the village, and the Usk Valley Walk follows its route.

4.6.3 Other key GI assets include:

- Cefn Ila Park and Garden
- Llanbadoc Island Access Land, adjacent to the River Usk
- Allotments
- Various sports clubs and recreation grounds
- Multiple churchyards



GI Opportunities

4.5.14 Key opportunities for strengthening the GI network in and around Usk through the restoration, maintenance, creation or connection of existing GI assets are also shown on the GI Network Plan (see **Diagram 4.6**). The key GI opportunities that would deliver the most significant benefits for people and wildlife are considered to be:

1. Usk Trail Action Group cycleway proposal along old railway line
2. Improvements to Usk Valley Walk and other local paths to make them more accessible.
3. Potential to create an Usk to Pontypool or Usk Railway path.
4. Improve the quality of the allotments.

4.5.15 Other general GI opportunities are:

- Ensure hedgerows are sensitively managed and well-connected with the wider hedgerow network and other semi-natural habitat features. (Not mapped)
- Ensure current blocks of semi-natural habitat and protected sites are sensitively managed and their extent increased where appropriate.
- Ensure ditches are sensitively managed.
- Increase access to inaccessible greenspace sites, where appropriate.
- Where appropriate, improve the quality of amenity greenspaces in Usk.
- Where appropriate, improve the quality of natural and semi-natural greenspaces in Usk.
- Management of community spaces by 'friends of', of similar groups.

DIAGRAM 4.6 Usk GI Network Plan

GI Assets

- Natural or Semi-natural Greenspace
- Statutory Biodiversity Designations
- Sites of Interest for Nature Conservation
- Watercourses/Waterbodies
- Historic Parks & Gardens
- Conservation Area
- Public Open Space
- Country Park
- Open Access Land (CRoW Act)
- Public Right of Way

Statutory Biodiversity Designations

- 5. Usk Valley/Afon Wysg SAC
- 6. River Usk (Lower Usk)/Afon Wysg (Wysg Isaf) SSSI

Historic Parks & Gardens

- 1. Cefn Ila, Llanbadoc

Public Open Space

- 7. Rugby Field, Coleg Gwent, Usk Campus
- 8. The Island Recreation Ground
- 9. Allotments (on A472)
- 10. Usk Rugby Football Club
- 11. Recreation Ground, Maryport Street
- 12. Usk Athletic Club
- 13. St Madoc's Church, Llanbadoc
- 14. Llanbadoc Island Play Park

- 15. Priors Church of St Mary, Usk
- 16. St Francis Xavier & St David Lewis Catholic Church
- 17. Allotments on Monmouth Road

Open Access Land (CRoW Act)

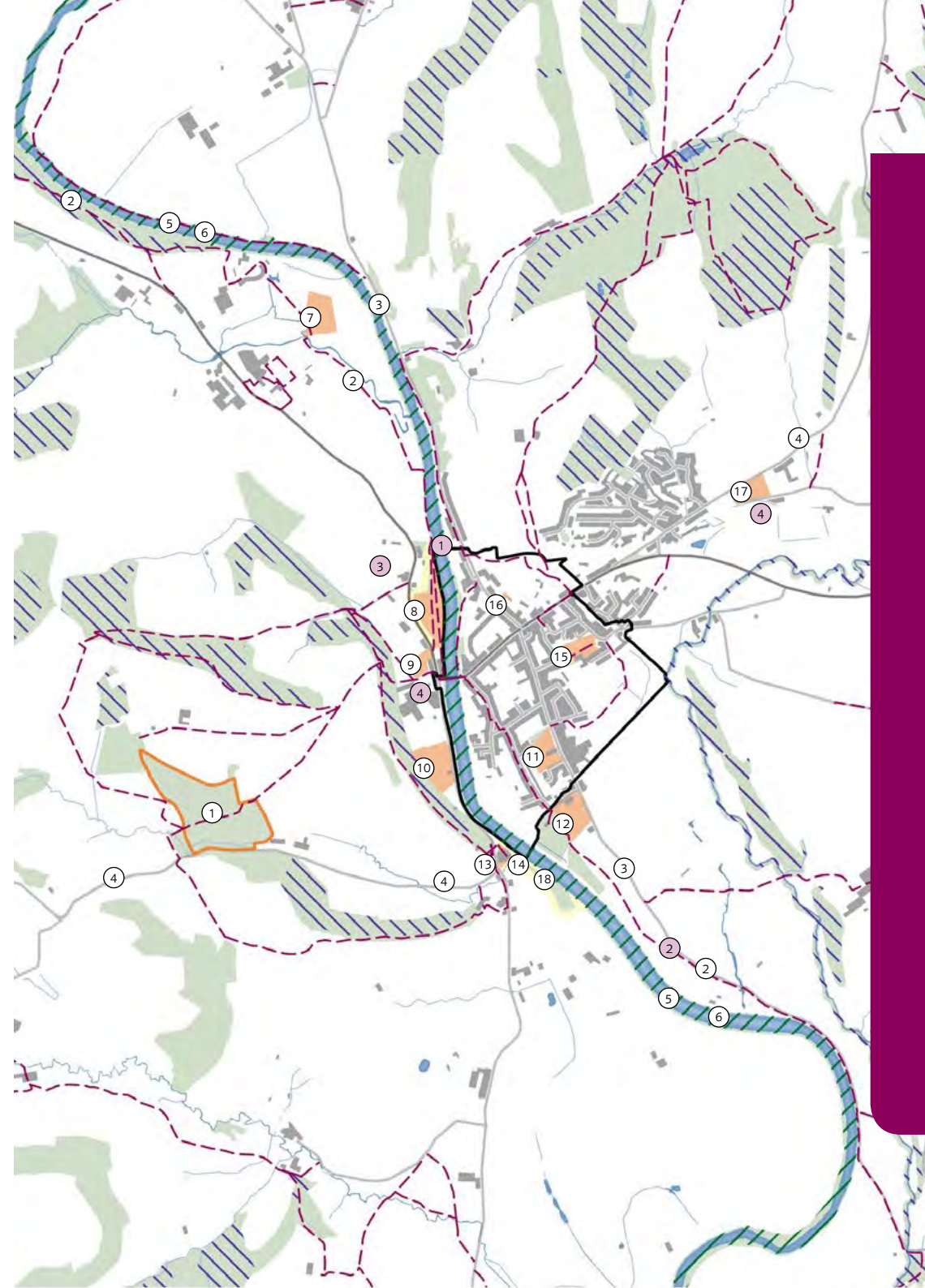
- 18. Llanbadoc Island

Promoted Routes

- 2. Usk Valley Walk
- 3. Sustrans National Cycle Network Route 42
- 4. Sustrans National Cycle Network Route 423

GI Opportunities

- ① Green Infrastructure Opportunities - see text for details



4.7 Raglan

GI Assets

4.7.1 The existing GI assets that provide the GI network in and around Raglan are shown on the GI Network Plan (see **Diagram 4.7**).

4.7.2 Raglan is a rural secondary settlement in the centre of Monmouthshire, surrounded by farmland. The Sustrans National Cycle Network Route 423 runs through the centre of the settlement, which is bounded to the north by the A40. The small watercourse Nant y Wilcae flows to the south of the village.

4.7.3 Other key GI assets include:

- Raglan Castle and Historic Park and Garden
- Allotments between Usk Road and the High Street
- Playing Field on Station Road



GI Opportunities

4.6.4 Key opportunities for strengthening the GI network in and around Raglan through the restoration, maintenance, creation or connection of existing GI assets are also shown on the GI Network Plan (see **Diagram 4.7**). The key GI opportunities that would deliver the most significant benefits for people and wildlife are considered to be:

1. Opportunity to develop Raglan 'Local ways' and health walks, eg. 'Healthy Footsteps Walk'

4.6.5 Other general GI opportunities are:

- Ensure hedgerows are sensitively managed and well-connected with the wider hedgerow network and other semi-natural habitat features. (Not mapped)
- Ensure current blocks of semi-natural habitat and protected sites are sensitively managed and their extent increased where appropriate. (Not mapped)
- Ensure ditches are sensitively managed. (Not mapped)
- Increase provision of or access to larger accessible greenspace sites. (Not mapped)
- Improve the quality of the natural and semi-natural greenspaces around the settlements and public rights of way. (Not mapped)
- Management of community spaces by 'friends of', of similar groups
- Ensure pond networks are sensitively managed for Great Crested Newts
- Tree planting for landscape character and biodiversity - field and hedgerow oaks are not being replaced as they die off.

DIAGRAM 4.7 Raglan GI Network Plan

GI Assets

-  Natural or Semi-natural Greenspace
-  Statutory Biodiversity Designations
-  Sites of Interest for Nature Conservation
-  Watercourses/Waterbodies
-  Historic Parks & Gardens
-  Conservation Area
-  Public Open Space
-  Country Park
-  Open Access Land (CRoW Act)
-  Public Right of Way

Historic Parks & Gardens

- 1. Raglan Castle

Public Open Space

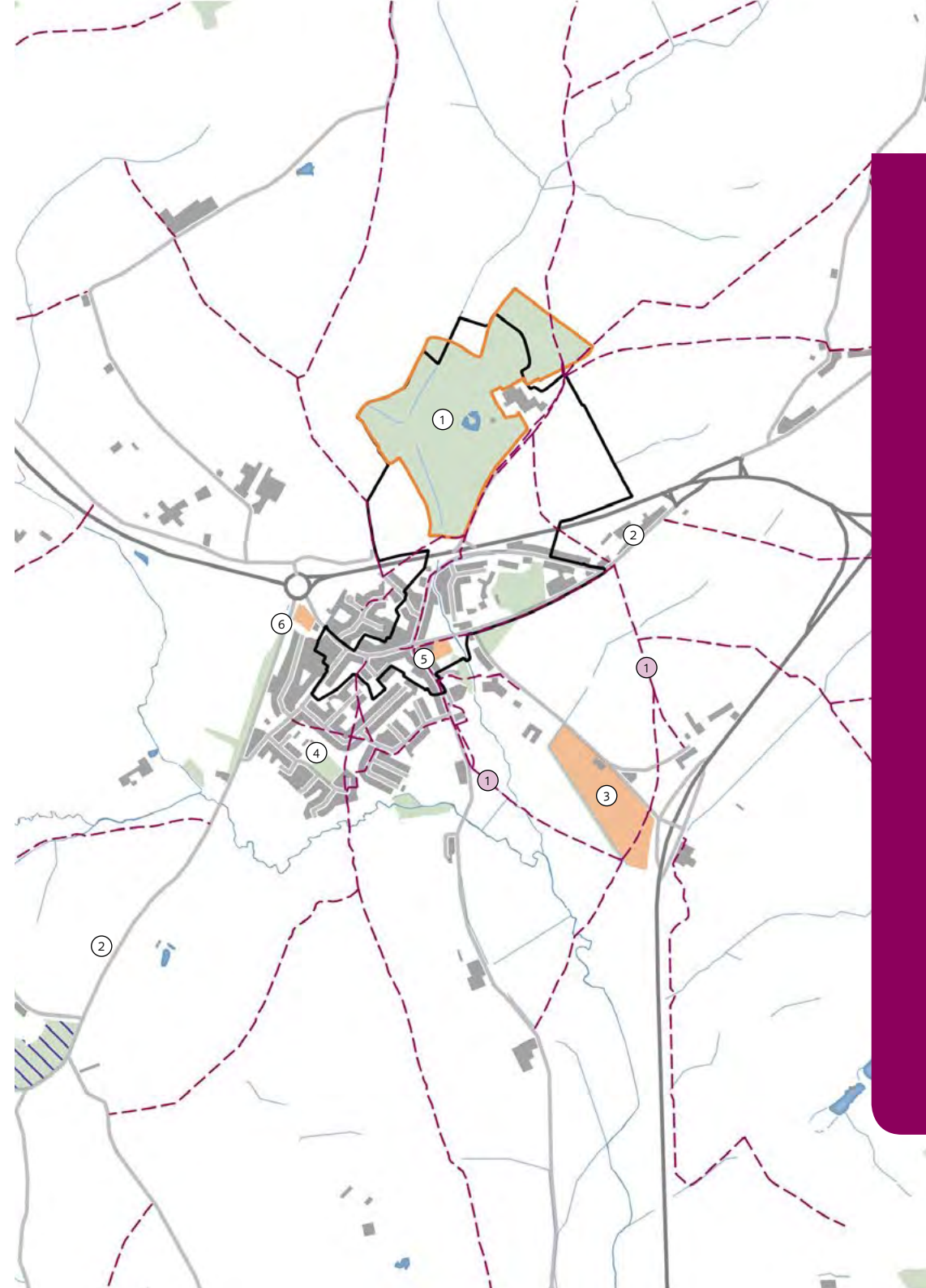
- 3. Playing Field, Station Road
- 4. Play Space on Prince Charles Road/Hoel Y Tywysog Siarl
- 5. The Church of St Cadoc
- 6. Allotments between Usk Road and High Street

Promoted Routes

- 2. Sustrans National Cycle Network Route 423

GI Opportunities

- ① Green Infrastructure Opportunities - see text for details



4.8 Penperlleni

GI Assets

4.8.1 The existing GI assets that provide the GI network in and around Penperlleni are shown on the GI Network Plan (see **Diagram 4.8**).

4.8.2 Penperlleni is a rural secondary settlement in the west of Monmouthshire, surrounded by farmland and woodland. The Monmouthshire and Brecon Canal lies approximately 0.5km to the west of the settlement.

4.8.3 Other key GI assets include:

- Areas of NRW Public Forest, including Wern Fawr to the north
- Churchyards at St Illtyd, Mamhilad; St Peter's, Goetre and Saron Baptist Church
- Playing Fields



GI Opportunities

4.7.4 Key opportunities for strengthening the GI network in and around Penperlleni through the restoration, maintenance, creation or connection of existing GI assets are also shown on the GI Network Plan (see **Diagram 4.8**). The GI opportunities that would deliver the most significant benefits for people and wildlife are considered to be:

- Ensure hedgerows are sensitively managed and well-connected with the wider hedgerow network and other semi-natural habitat features. (Not mapped)
- Ensure current blocks of semi-natural habitat and protected sites are sensitively managed and their extent increased where appropriate. (Not mapped)
- Ensure ditches are sensitively managed. (Not mapped)
- Increase public access to/provision of natural and semi-natural greenspace in and around the settlement. (Not mapped)
- Management of community spaces by 'friends of', of similar groups

DIAGRAM 4.8 Penperlleni GI Network Plan

GI Assets

- Natural or Semi-natural Greenspace
- Statutory Biodiversity Designations
- Sites of Interest for Nature Conservation
- Watercourses/Waterbodies
- Historic Parks & Gardens
- Conservation Area
- Public Open Space
- Country Park
- Open Access Land (CRoW Act)
- Public Right of Way

Statutory Biodiversity Designations

- 3. River Usk SAC
- 4. River Usk (Lower Usk)/Afon Wysg (Wysg Isaf) SSSI

Public Open Space

- 5. The Church of St Illtyd, Mamhilad
- 6. Playing Field/Play Space on Fairfield/Park Y Brain Lane
- 7. Goytre AFC (Football Ground on Plough Road)
- 8. St Peter's Church, Goetre
- 9. Saron Baptist Church, Saron Road

Other Open Spaces

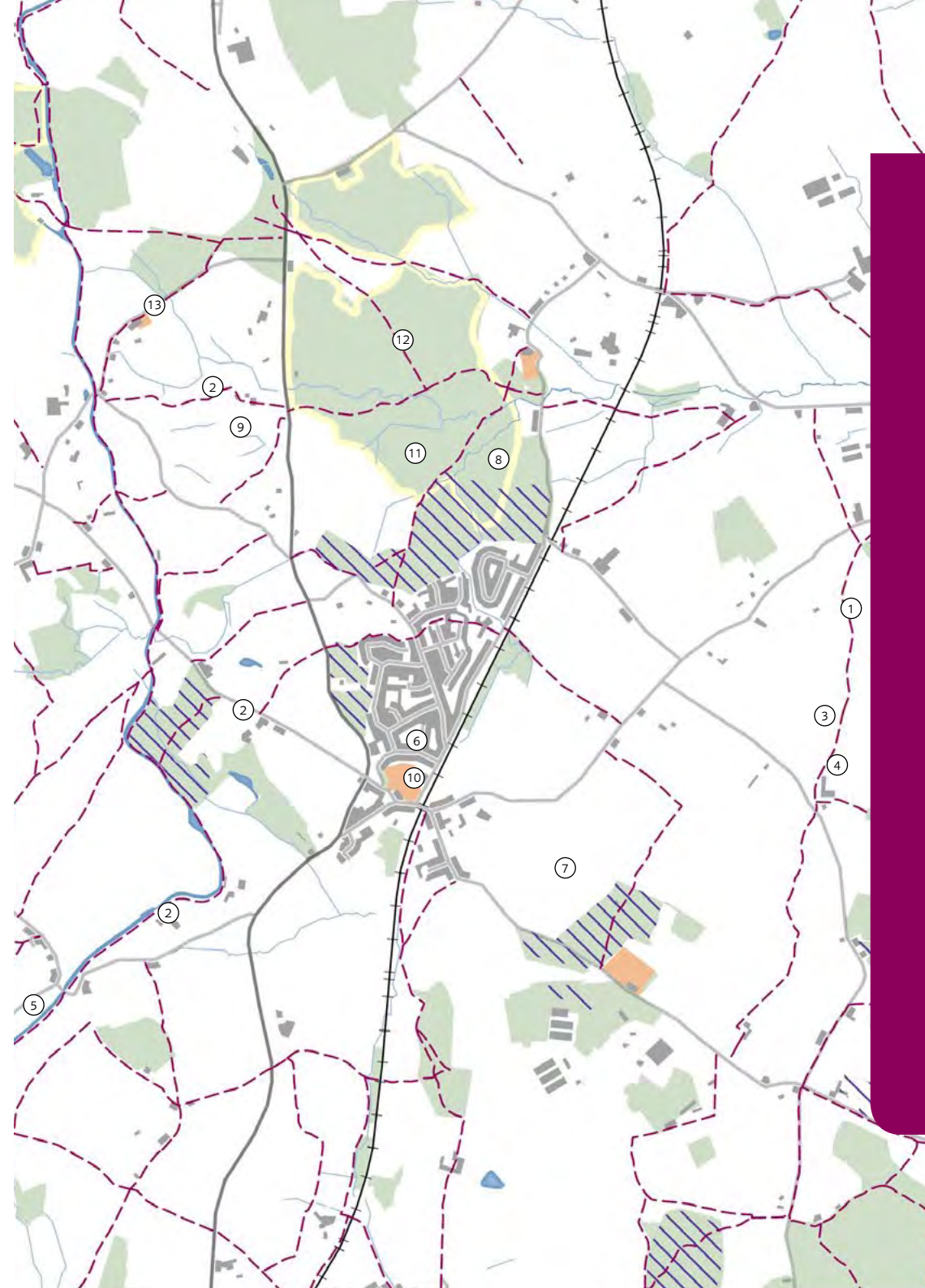
- 10. Goytre Fawr Primary School Playing Fields

Open Access Land (CRoW Act)

- 11. Wern Fawr
- 12. Llwh
- 13. Coed Mawr

Promoted Routes

- 1. Usk Valley Walk
- 2. Sustrans National Cycle Network Route 49





Appendices



a

Acknowledgements

Contributor acknowledgements

Monmouthshire County Council Steering Group

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Colette Bosley Green Infrastructure Team Leader

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CBA Consultant Team

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Harriet Stanford Project Co-ordinator

Bill Wadsworth

Stuart Radcliffe

Stakeholders

See **Appendix C** for details

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Front cover

IDS.photos

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Page 6 (left to right)

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Monmouthshire County Council

2.0 The GI Approach in Monmouthshire Flysheet

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3.0 Embedding GI into Development Flysheet

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Page 26

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Page 27

Linda Yarrow

4.0 Settlement Green Infrastructure Networks Flysheet

Google

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Andrew H

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Philip Pankhurst

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Colin Madge

Maigheach-gheal

Appendices Flysheet

Mike Erskine

Page 125

Robin Drayton

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A person with some photos

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Notes:

The digital data used in this study represents currently available datasets.

The datasets have not been modified or enhanced, and their accuracy cannot be guaranteed.

Datasets sourced from Natural England/Historic England have been used to enable identification of cross-border GI assets.

C

Stakeholder Consultation Record

MONMOUTHSHIRE GREEN INFRASTRUCTURE STRATEGY

STAKEHOLDER WORKSHOP NOTE

Workshop 1

18th June 2018, County Hall, Usk

Attendees

Colette Bosley	Monmouthshire CC - Principal Green Infrastructure and Landscape Officer
Craig O'Connor	Monmouthshire CC - Development Management
Hazel Clatworthy	Monmouthshire CC - Policy and Performance
Jill Edge	Monmouthshire CC - Planning Policy
Judith Langdon	Monmouthshire CC - Community and Partnerships
Kate Stinchcombe	Monmouthshire CC - Senior Biodiversity Officer
Mark Davies	Monmouthshire CC - Highways
Matthew Gatehouse	Monmouthshire CC - Head of Policy and Performance
Matthew Lewis	Monmouthshire CC - GI & Countryside Manager
Mike Moran	Monmouthshire CC - GI & Countryside (Play & Recreation)
Nick Keyse	Monmouthshire CC - Estates
Nicola Edwards	Monmouthshire CC - Food and Tourism Manager
Nigel Leaworthy	Monmouthshire CC - Head of Grounds Maintenance
Ruth Rourke	Monmouthshire CC - PROW Team Leader
Sharran Lloyd	Monmouthshire CC - Community and Partnerships
Richard Barter	Monmouthshire Housing Association
Scott Thomas	Monmouthshire Housing Association
Andrew Nevill	Torfaen CBC - Senior Landscape Officer
Emily Finney	Welsh Government - Natural Resource Policy
Lisa Fiddes	Welsh Government - Inspector of Historic Areas
Siobhan Wiltshire	Welsh Government - Planning (Landscape and GI)
Fen Turner	Natural Resources Wales - Senior Planner
Tim Wroblewski	TACP (on behalf of Caerphilly CC)
Dominic Watkins	Chris Blandford Associates (Facilitators)
Bill Wadsworth	Chris Blandford Associates (Facilitators)
Harriet Stanford	Chris Blandford Associates (Facilitators)

Purpose of Workshop 1

To engage stakeholder in identifying local strategic priorities for potential investment in Green Infrastructure.

Stakeholder Feedback

Discussion Group A (Facilitated by DW/HS)

- Landscape-scale projects:
 - Living Levels
 - RECS – Renewable Energy and Community Schemes
 - Wye Valley AONB
 - Flood Management and Habitat Creation/Natural Flood Risk Management
- The public value their landscape, countryside and green spaces in Monmouthshire
- Wellbeing and access to greenspace:
 - This needs to be wider than literal access
 - People who could most benefit are often missing out
 - Facilitate access to green spaces close to home rather than travelling to facilities further afield – there is a lack of public transport
- Habitat fragmentation
- What is the approach to connectivity?
- How does the GI Strategy link to other Strategies and Acts – for example the Active Travel Act and the Play Strategy?
- Public Rights of Way:
 - Need to be more functional with links to internal areas of settlements
 - What is the legibility of the connections
 - How useable are they? What state of maintenance
 - Shirenewton example – has good links to schools
 - Connections between where people live and work
 - Health walks – being addressed in the ROWIP. These facilitate GPs to be able to prescribe walks, and help GP referral walking groups
 - Healthy walking schemes and groups (eg. Raglan)
 - Promotion of these is important
 - Routes need to be easy to use and attractive
- Place-making agenda
- How to encourage people to be a part of maintenance etc – expand beyond the current demographic
- Air quality – using GI to mitigate
- Land management:
 - Biodiversity – managing MCC land for function
 - County farms – forward plans
 - Management of public sector land across the region
 - Engaging with the management of land beyond that usually managed for biodiversity/flood management etc. that is within public ownership (MCC/NRW etc)
- Pollinators need to be a priority – there are challenges in keeping the pollinators agenda in current thinking
- Living levels – integrate with current projects
- Wye Catchment Partnership – there are projects/advice etc going on within the English part of the AONB
- Natural flood risk management in the Brecon Beacons
- Raise awareness of management costs when embedding GI into new development – costs need to be sensible for tenants
- Education – in schools and elsewhere
- Breadth of user groups
- Brexit needs to be considered – including the impact of agriculture and sustainable land management. Local connections in the agricultural community. Welsh government consultation currently underway?
- Destination development plan – access to the countryside is part of the key offer
- Social Justice Strategy – access to greenspace
- MCC Corporate Plan
- AONB Management Plan – review – about to go into next cycle

Discussion Group B (Facilitated by BW/CB)

- Historic Theme:
 - Connectivity/links between historic assets
 - Links within settlements between greenspaces
- Wellbeing (Wellbeing Plan/Corporate Strategy):
 - Green/blue corridors for active travel
 - Ease of navigation of active travel
 - Food growing/healthy eating
 - Allotments
 - Local markets – delivering back to people
 - Mental health wellbeing
 - Health Impact Assessments
 - Promotion of access to GI - getting info to people to use assets
 - Availability of GIS info for local communities
 - Data Rationalisation
- Landscape-scale connectivity:
 - Needs and opportunities analysis for global response
 - Biodiversity and ecosystem services to underpin GI
 - Working at scale for resilience
- Ecosystem Services:
 - Flood risk in rural and urban centres
 - Farming – MCC landholding use for flood risk and control
 - Access – guiding people to high [NOx] without compensation
 - Monocropping
 - No hinterland
 - Ecosystem services analysis in terms of what GI assets can provide via, for example, management.
- Access:
 - Safe cycle routes
 - Additional access to GI
- Future Proofing:
 - Removal of toll = increased traffic/increased settlement, etc.
- Incentivising:
 - Packages/presentation to landowners
 - Online presence/info
 - Not just about best practice
 - Partnership working
- Tourism:
 - Destinations and interpretation of GI Assets/Value
 - Big/Inspiring Projects
 - Communication routes/access
 - Minimising impact
- Valuation:
 - Non-monetary valuation
 - Monetary valuation of GI to demonstrate value of GI investment
- Adaptability/Flexibility

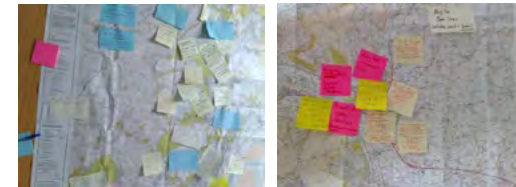
Workshop 2
19th June 2018, Shire Hall, Monmouth

Attendees

Colette Bosley	Monmouthshire CC - Principal Green Infrastructure and Landscape Officer
Jill Edge	Monmouthshire CC – Planning Policy
Judith Langdon	Monmouthshire CC – Policy and Communications
Kate Stinchcombe	Monmouthshire CC – Senior Biodiversity Officer
Mark Cleaver	Monmouthshire CC – Grounds
Matthew Lewis	Monmouthshire CC – Countryside Manager
Ruth Rourke	Monmouthshire CC – PRoW Team Leader
Cllr Ann Webb	Monmouthshire CC
Cllr R.G. Roden	Monmouthshire CC
Cllr Tony Easson	Monmouthshire CC
Cllr Tony Konieczny	Abergavenny TC
Cllr Brian Counsell	Caerwent CC
Cllr Dave Evans	Caldicot TC
Peter Cloke	Natural Resources Wales
Andrew Blake	Wye Valley AONB
Neville Hart	Gwent Wildlife Trust
Nicola Bradbear	Bee Friendly Monmouthshire
Steph Tyler	Monmouthshire Meadows
Dominic Watkins	Chris Blandford Associates (Facilitators)
Bill Wadsworth	Chris Blandford Associates (Facilitators)
Harriet Stanford	Chris Blandford Associates (Facilitators)

Purpose of Workshop 2

To engage stakeholders in identifying potential Green Infrastructure projects in and around the key settlements through an opportunity mapping exercise (as illustrated by extracts below).



Workshop 2
19th June 2018, Shire Hall, Monmouth

Attendees

Colette Bosley	Monmouthshire CC - Principal Green Infrastructure and Landscape Officer
Jill Edge	Monmouthshire CC – Planning Policy
Judith Langdon	Monmouthshire CC – Policy and Communications
Kate Stinchcombe	Monmouthshire CC – Senior Biodiversity Officer
Mark Cleaver	Monmouthshire CC – Grounds
Matthew Lewis	Monmouthshire CC – Countryside Manager
Ruth Rourke	Monmouthshire CC – PRoW Team Leader
Cllr Ann Webb	Monmouthshire CC
Cllr R.G. Roden	Monmouthshire CC
Cllr Tony Easson	Monmouthshire CC
Cllr Tony Konieczny	Abergavenny TC
Cllr Brian Counsell	Caerwent CC
Cllr Dave Evans	Caldicot TC
Peter Cloke	Natural Resources Wales
Andrew Blake	Wye Valley AONB
Neville Hart	Gwent Wildlife Trust
Nicola Bradbear	Bee Friendly Monmouthshire
Steph Tyler	Monmouthshire Meadows
Dominic Watkins	Chris Blandford Associates (Facilitators)
Bill Wadsworth	Chris Blandford Associates (Facilitators)
Harriet Stanford	Chris Blandford Associates (Facilitators)

Purpose of Workshop 2

To engage stakeholders in identifying potential Green Infrastructure projects in and around the key settlements through an opportunity mapping exercise (as illustrated by extracts below).





Stakeholder Feedback

Abergavenny
Wye Usk Foundation - 1yr project with farmers to improve banks/soil erosion and identify sites for habitat improvement
Abergavenny Community Orchard
Incredible Edible Abergavenny
Mardy Park Environmental Group
Gavenny Project - Castle Meadows. Confluence of Gavenny and Usk. Bank Management/Clearance. Management of Water Meadows. NRW, MCC, ATC. Volunteers - Friends of Castle Meadows. Abergavenny Civic Society
Gavenny Project - Swan Meadow. East bank side could be developed as a wild flower meadow. Some habitat improvement undertaken by MCC
Gavenny Project - Podcast. http://www.countryfile.com/podcast/wildlife-wildlife-stories/wade-welsh-river-search-wildlife
KHS/Abergavenny Leisure Centre. 21st Century School Sport and Leisure Provision
Friends of Castle Meadows - education and conservation work
Possible - Introduction of Park Run - weekly 5k walk/run. Free event every Saturday
Caerwent
Limestone influenced habitats around MOD Land - Critical for rare biodiversity. Potential for greater partnership working.
Introduction of Junior Park Run , weekly free event, 2k every Sunday morning
King George Playing Fields Caldicot
Chepstow
Introduction of Park Run. Weekly 5k walk/run. Free event every Saturday morning.
Chepstow School/Leisure centre. 21st Century School Sport and leisure provision.
Piercefield House Circular Walk. Needs improving re-signage and replacing old stiles with KG. Some interpretation on-site would be beneficial for locals/tourists as lots of landscape/biodiversity/heritage



Monmouth
Future project - Kingswood Area - pilot project demonstrating natural flood management techniques and benefits for water quality, flood reduction, biodiversity etc.
Some excellent sites include along the Monnow above Osbaston Forge, within Bridges Centre etc. Management is key. Ditto road verges. Native grassland beats annual beds.
Stop mowing some green spaces in Monmouth until August - then cut and remove
Introduction of junior park run - 2k run/walk every Sunday
Introduction of Park Run - 5k weekly run/walk - possible Chippenham Fields.
Erosion on bank of Wye Valley Walk at Monmouth
Cycle corridor south from Monmouth
Preserve Troy Gardens/Old Station/Wildlife/Eco
Community Woodland Claypatch Wyesham
Keep free of building houses [nb - highlight along east side of A466]
Save the Catalpa Tree [in St. James' Square]
Reduce run-off on hills in Osbaston. Planting in field E of Prospect Road - need landowner permission
Penperlleni
Goytre Wharf. NRW Woodland. NRW looking at how new paths for all abilities can be created, currently consulting with users.
Rogiet
NRW Slade Wood. Areas are managed for butterflies. Also management agreement with Gwent Wildlife Trust to look after meadows.
Usk
Incredible Edible Usk
Usk in Bloom



Other Locations
Buglife Bee-Lines. Includes coast and several corridors
Need to understand difference between desk-top study of rights of way and lived experience. (eg. RoW that are obstructed by nettles, mud, large cattle. etc)
Deer management is key aspect of enhancing the quality of Lower Wye Valley woodlands - hence future support is critical for woodland biodiversity
Connect Wentwood with Chepstow Park Wood (and then on to Wye Valley)
Wentwood - NRW working with Woodland Trust on improving access and reducing anti-social behaviour. Partnership Group including volunteers needs to take place.
NRW Chepstow Park Wood. NRW are working with access team to look at how access can be improved.
New Housing Developments - strategy for developers to provide bird boxes (swifts, sparrows etc) built into new estates. New GI for wildlife.
Nearly all NRW forestry land holding is open access and can be used for informal recreation
Woodland Trust - current PAWS restoration project. GIS. GWT involved.
GI and NFM on Wye tributaries Tintern to Penallt
Leasing county farms to conservation groups
Managing focussed landscapes for bats ('batscape') approach. Horseshoe bat SAC. 'Landscapes' around roosts.
Improve quality of hedgerow management. Follow practise recommended in Bee Friendly Monmouthshire - Hedgerow Manifesto
More careful mowing of Monmouthshire's verges. Training of contractors and operatives.
Stop mowing! Stop destroying hedgerows! These are crucial wildlife corridors and enhance the environment for everyone.
Stop glyphosate soaking every kerbside.
Avoid herbicide use in Monmouth and elsewhere
Veteran, ancient and future veteran trees need nurturing (and incentivising management/care)
SMS funded heathland restoration project pending stage 2 application (last lowland heathland around Trellech)
Connecting special wildlife sites and orchards, Monmouthshire meadows sites and tributaries and corridors throughout AONB
Drystone walls are key habitats and corridors
Flood plain restoration - reversion to grassland
Green Infrastructure Management Plans on countryside and 'attractions' sites
GWT - Over 400 LWS across Gwent. Owners supported, landowner days, GIS map collated.
Nature isn't neat. Pilot town to be decided. RDP - Pollinator Project



Potential to increase recreation and biodiversity/tourism in Wye Valley AONB area - issues with maintenance of county unclassified roads/users
--

Bread and cheese walk in bad state of repair. Private land. Rare landscape/plants

d

Strategic GI Network Assessment

d1

GI Assets Audit

Natural and semi-natural greenspaces

Natural and semi-natural greenspaces (see **Diagram D1.1**) encompass a broad range of habitat types (see **Diagram D1.2**) that can be found both within (see **Diagram D1.3**) and outside designated wildlife sites, including:

- woodland & scrub
- grassland, heath and moor
- wetlands
- open/running water
- coast

In addition to supporting a range of habitats for wildlife, these natural and semi-natural greenspaces can also, where appropriate, provide managed access for informal recreation (such as walking and bird watching at Fiddler's Elbow and Cleddon Bog nature reserves and the surrounding undesignated or ancient woodlands, which are partially accessible).

Grasslands are concentrated in the northwest of the county, predominantly associated with the uplands, though there are scattered pockets elsewhere. Heath is also concentrated in the uplands in the northwest of the county. Monmouthshire has a high concentration of woodlands and watercourses scattered across the county, but with a particular concentration of woodlands in the Wye Valley and south of the county, and with a distinctive concentration of small watercourses in the Gwent Levels.

Information on the current condition of many of the designated sites is limited, however management plans for the European Sites demonstrate that a number of the sites are in unfavourable condition, and the Monmouthshire Biodiversity and Ecosystem Resilience Forward Plan (2017) states that 'the extent and quality of habitats in the County is largely reducing'.

DIAGRAM D1.1 Natural and Semi-Natural Greenspaces



DIAGRAM D1.2 Habitats

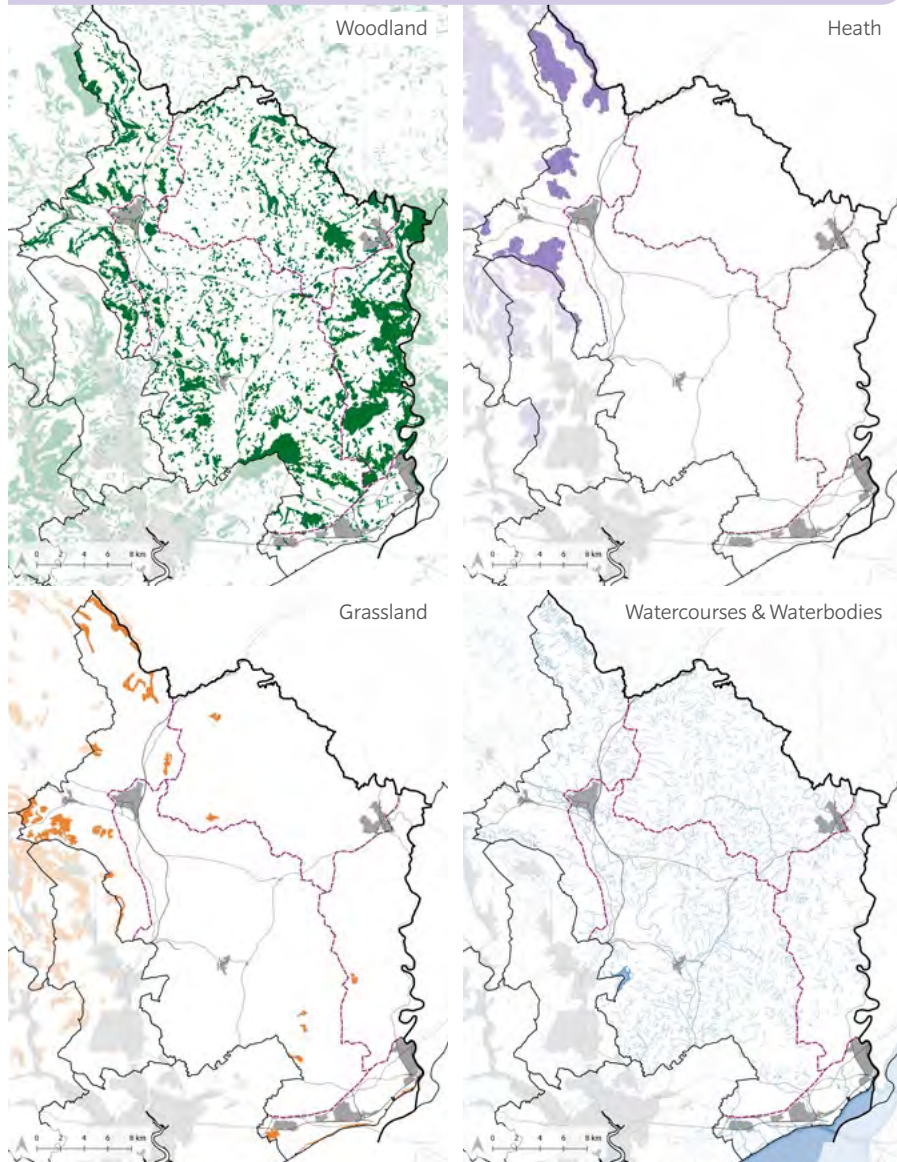
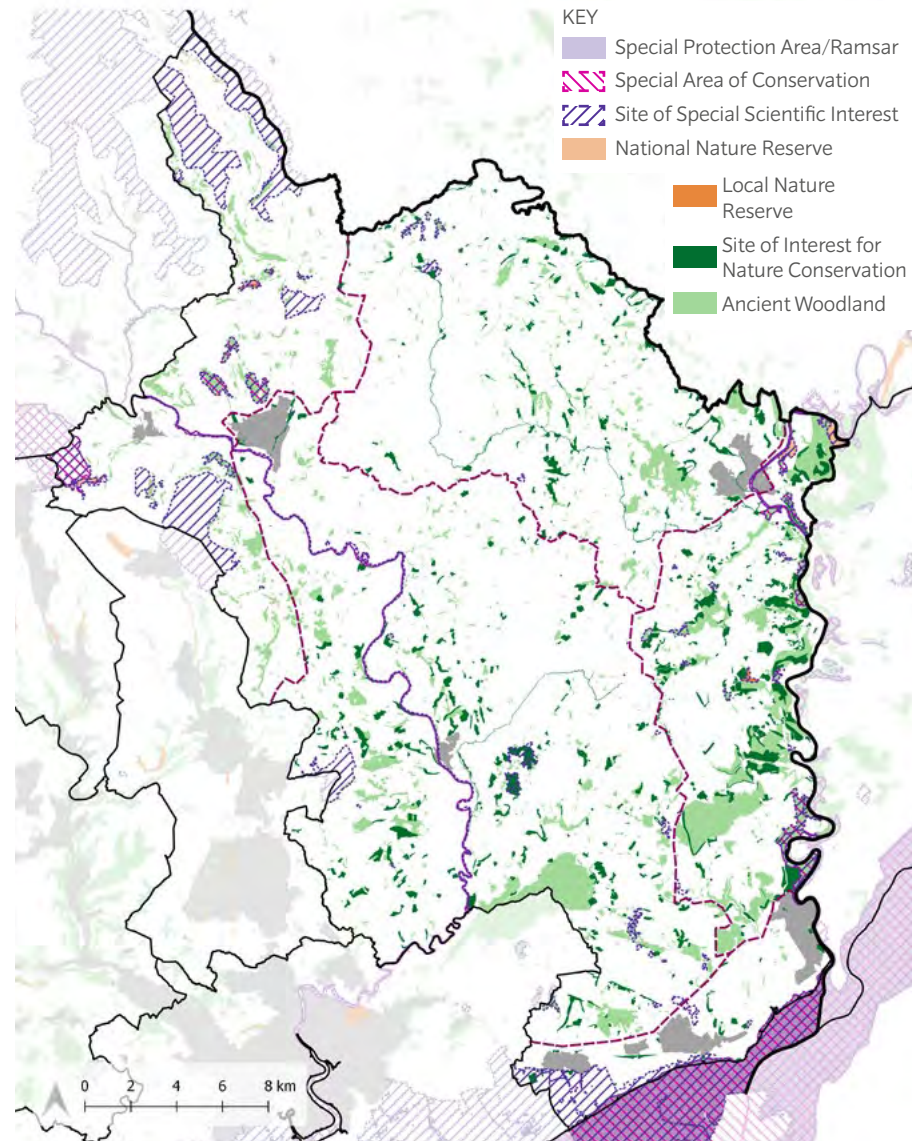


DIAGRAM D1.3 Biodiversity Designations

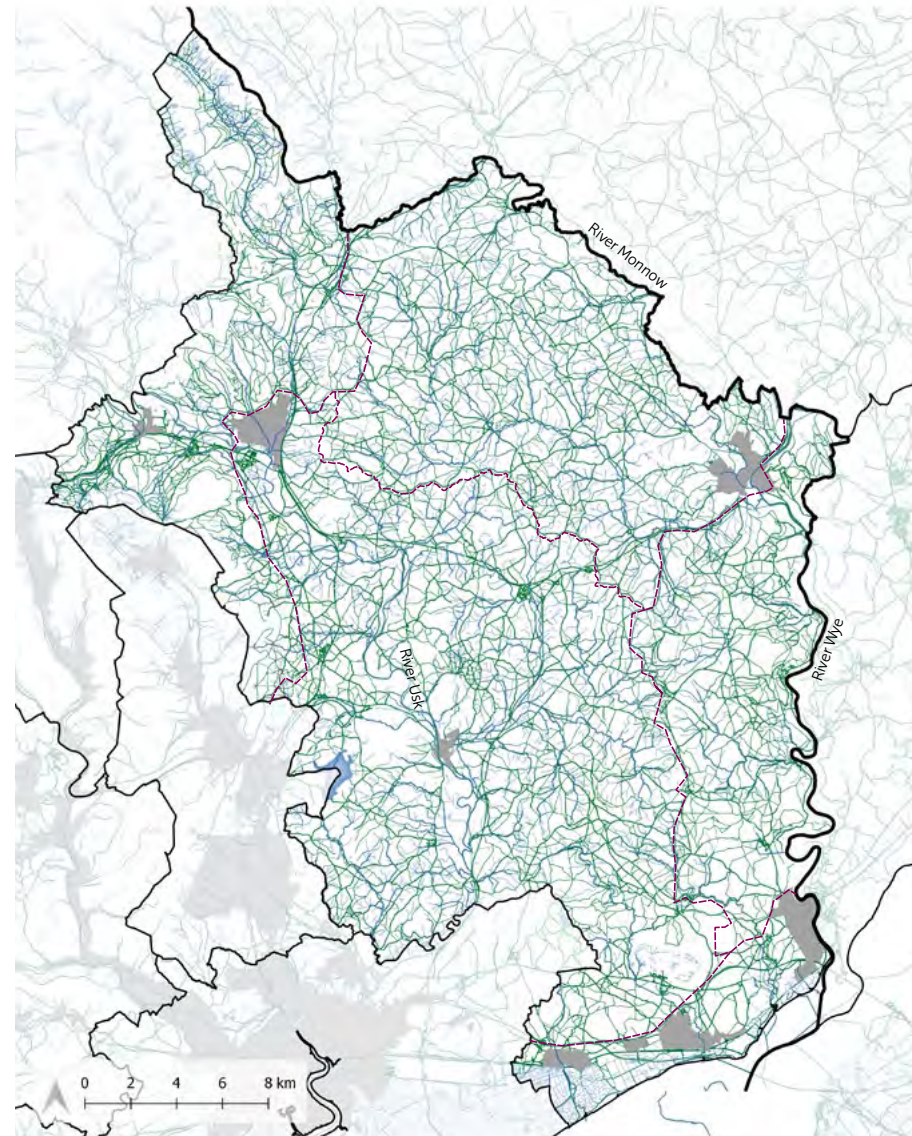


Green and blue corridors

Linear landscape features encompassing semi-natural and natural terrestrial and aquatic habitats (see **Diagram D1.4**). In addition to function in supporting wildlife dispersal, corridors also provide opportunities for walking, cycling and other outdoor recreation activities. Within Monmouthshire, significant green and blue corridors include:

- The larger Rivers **Usk**, **Wye**, and **Monnow** (important green/blue corridors incorporating public access in some places such as the Usk and Wye Valley Walks)
- Smaller watercourses including the River Trothy, Nedern Brook, Olway Brook and Mill Reen.
- The ditch and reen network on the Gwent Levels (important green/blue corridors incorporating public access in some places)
- The Severn Estuary (an important marine blue corridor for migration of fish and birds).
- The sea wall along the Severn Estuary (an important green corridor for plant communities and pollinators, incorporating the Wales Coast Path for much of its length)
- Historic green lanes and byways
- Highway and railway verges between settlements (important green corridors)

DIAGRAM D1.4 Green and Blue Corridors



Productive landscapes (farmland, woodlands and allotments)

Farmland, orchards and allotments can contribute to local food production and landscape character. Monmouthshire is well wooded, particularly through the Wye Valley in the east and across to Wentwood in the southwest. Scattered small woodlands are also a feature across the farmland that makes up much of the central part of the county.

Farmland (see **Diagram D1.5**) includes both commercial farming businesses and small holdings, consisting of a predominantly pastoral farming landscape with pockets of arable land. The highest quality, and thus most productive agricultural land is found in the south of the county, in the Gwent Levels and across the south and through the middle of the Usk Catchment Zone. The poorest quality farmland is found in the uplands, and is usually grazed by sheep where it is used for farming.

Zone	% of Zone Grade 1 or 2
A: Gwent Levels	35%
B: Wye Valley	29%
C: Usk Catchment	44%
D: Wye Catchment	35%
E: Brecon Beacons Uplands	9%
Monmouthshire	31%

DIAGRAM D1.5 Productive Landscapes - Farmland

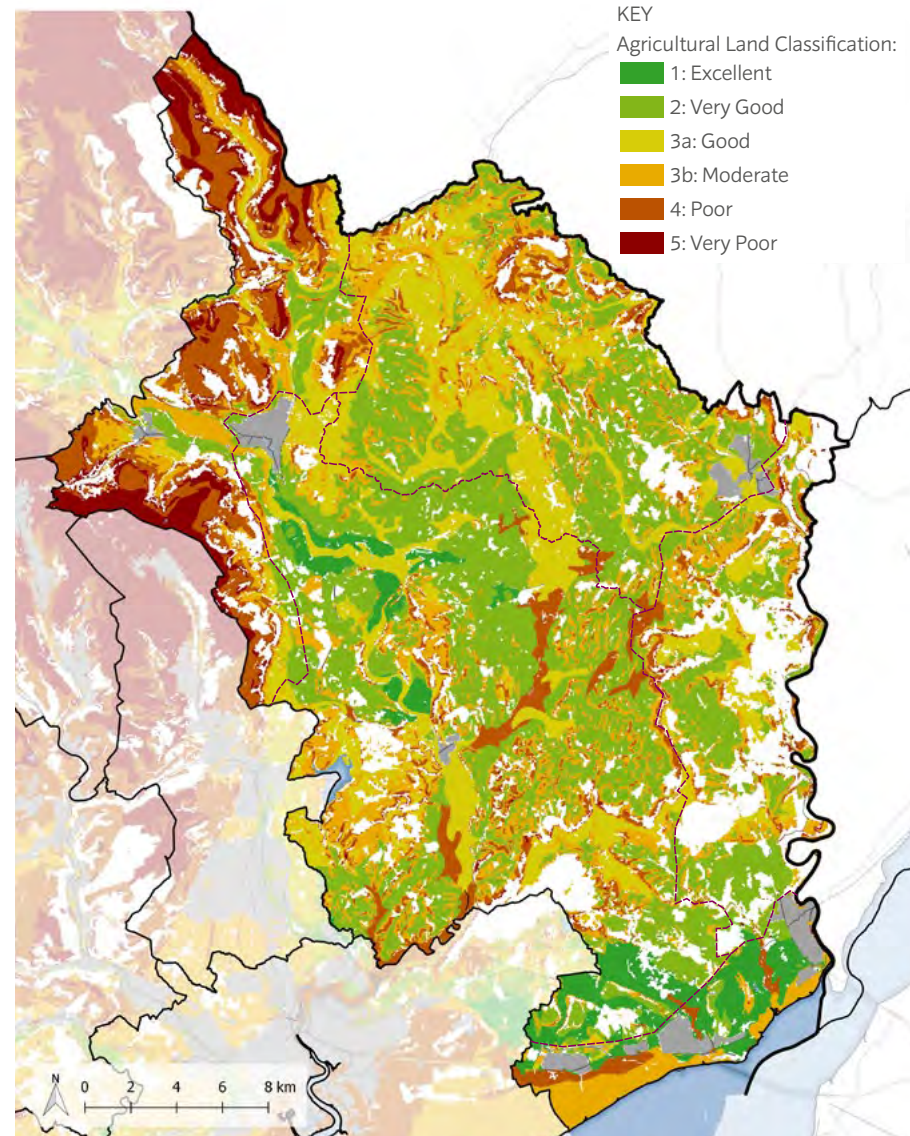
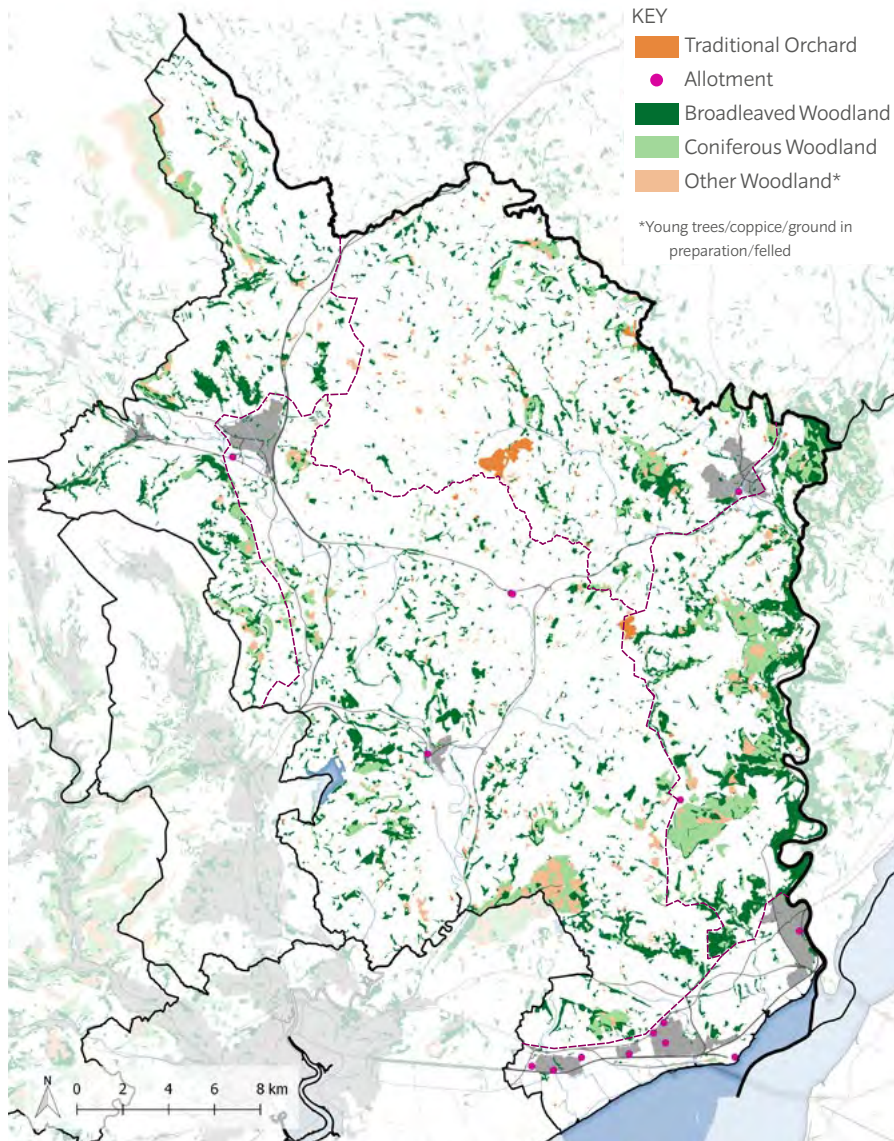


DIAGRAM D1.6 Productive Landscapes - Woodland & Allotments



Monmouthshire is a heavily wooded county (see **Diagram D1.6**), particularly through the Wye Valley and in the south of the Usk Catchment. Large areas of this woodland in the county are also accessible, such as in the Wye Valley, where 2,914 Ha of a total 4,807Ha are accessible.

Historically, orchards were a distinctive feature of the landscape found alongside farms, and in the south, orchards on the Gwent Levels produced their own specific apple and pear varieties. However, the end of cider making locally resulted in the loss of orchards, and in the Monmouthshire area of the Levels they are now limited to a few sites in the vicinity of Magor on the Caldicot Level. Elsewhere in the county, there are small scattered areas of traditional orchard remaining, with larger areas to the southeast of Llantilio Crosenny and southeast of Raglan. There are some small areas of allotments around the larger settlements.

Zone	Woodland (% of Zone)	NRW Public Forest (Accessible)	Allotments
A: Gwent Levels	509 Ha (11%)	-	9
B: Wye Valley	4,807 Ha (40%)	2,914 Ha	-
C: Usk Catchment	4,539 Ha (14%)	745 Ha	5
D: Wye Catchment	2,087 Ha (10%)	171 Ha	1
E: Brecon Beacons Uplands	2,662 Ha (18%)	1,396 Ha	-
Monmouthshire	13,743 Ha (16%)	5,056 Ha	15

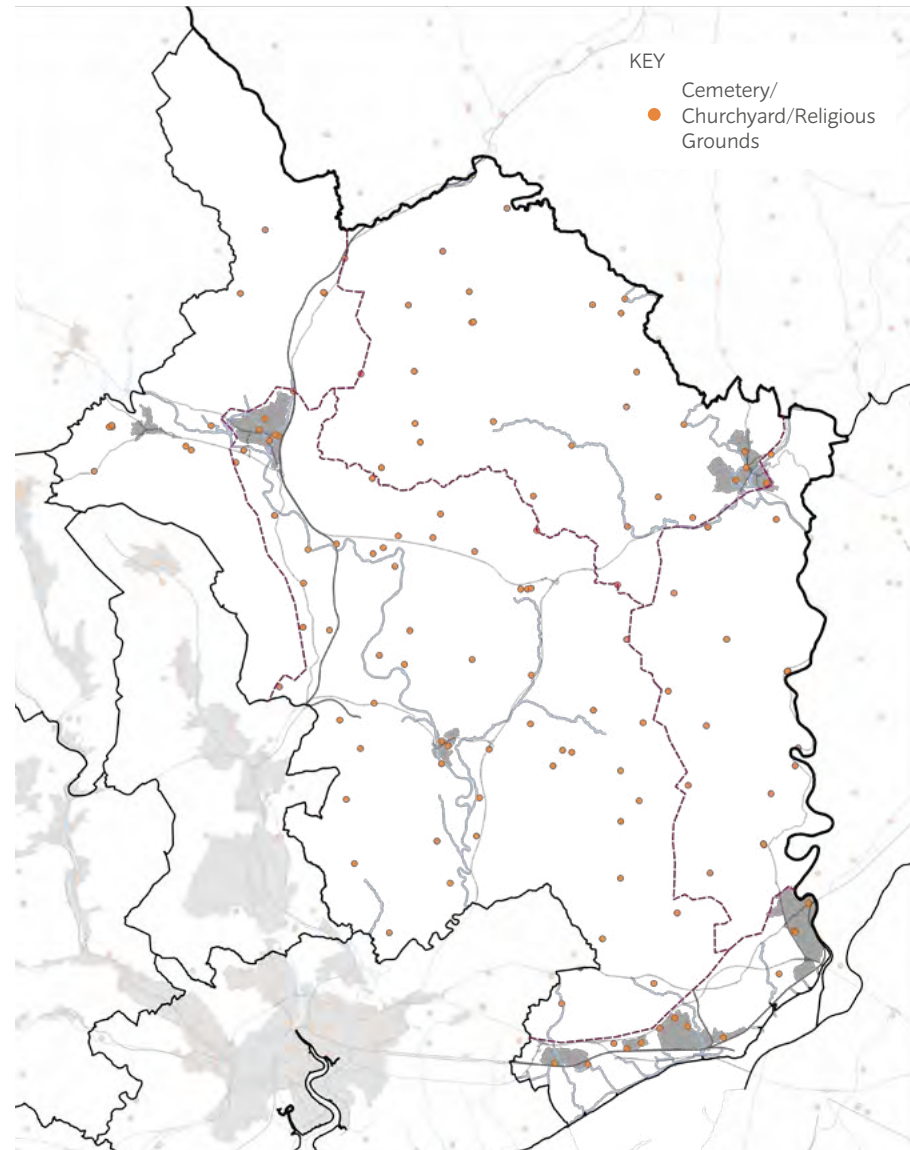
Cemeteries and churchyards

In addition to providing important habitats for wildlife, cemeteries and churchyards (see **Diagram D1.7**) can also provide opportunities for quiet reflection and spiritual enrichment that contribute to people's well-being. Examples in Monmouthshire include urban cemeteries (such as Osbaston Cemetery in Monmouth), churchyards associated with small rural parish churches (such as St Teilo's Church, Llanarth, and St. Nicholas Church, Trellech) and cemeteries and churchyards on the edge of urban areas, such as Dewstow Road Cemetery on the northern side of Caldicot.

Zone	Religious Grounds and Cemeteries*
A: Gwent Levels	12
B: Wye Valley	14
C: Usk Catchment	60
D: Wye Catchment	31
E: Brecon Beacons Uplands	12
Monmouthshire	124

*Nb - numbers taken from Ordnance Survey Greenspace data. Diagram D1.5 includes both Ordnance Survey Greenspace data, and data from the Monmouthshire Open Space Study, 2008

DIAGRAM D1.7 Cemeteries and Churchyards



Parks and gardens

Public parks and gardens (see **Diagram D1.8**) provide opportunities for informal recreation that can contribute to people's health and well-being, and also provide habitats for wildlife. There are few urban parks in the county, including Bailey Park in Abergavenny, and larger Country Parks include Caldicot Castle Country Park and Clytha Park near Abergavenny.

Zone	Parks and Gardens
A: Gwent Levels	2
B: Wye Valley	-
C: Usk Catchment	8
D: Wye Catchment	-
E: Brecon Beacons Uplands	2
Monmouthshire	12

*Nb - numbers taken from Ordnance Survey Greenspace data. Diagram D1.5 includes both Ordnance Survey Greenspace data, and data from the Monmouthshire Open Space Study, 2008

DIAGRAM D1.8 Parks and Gardens



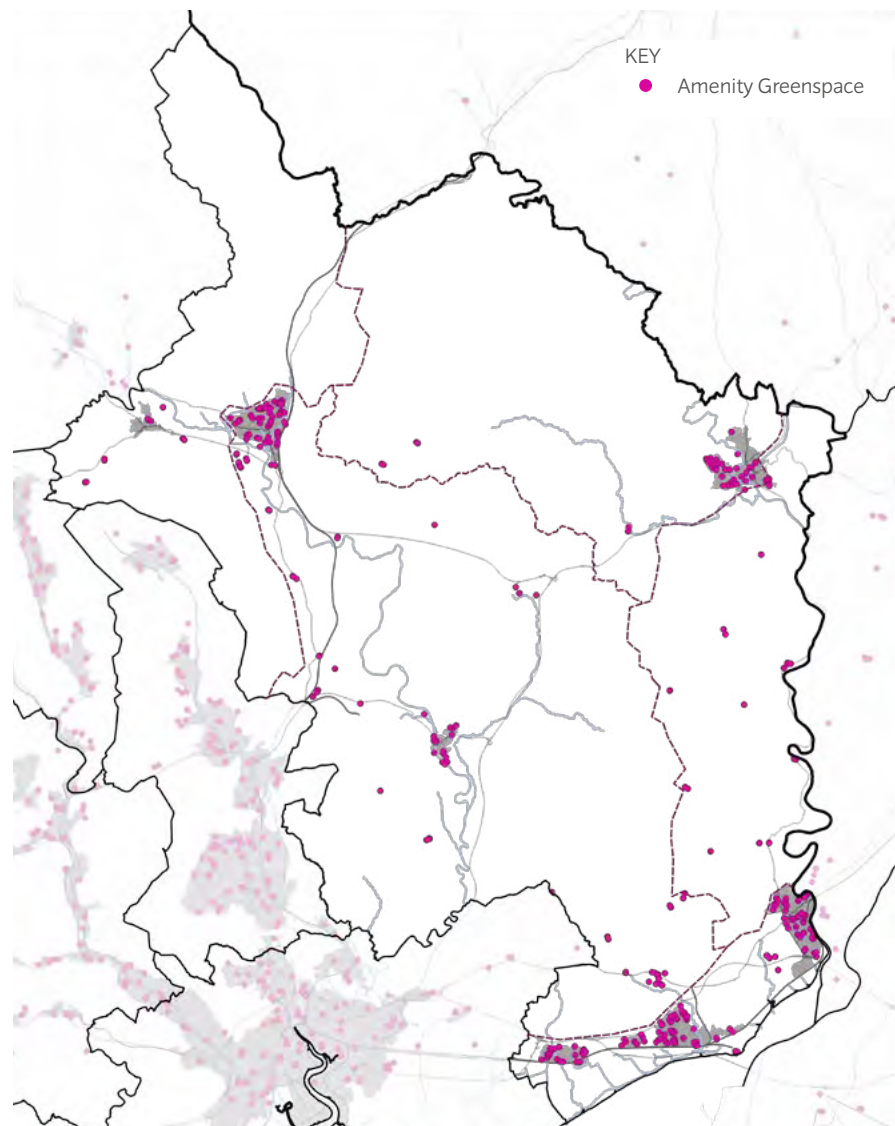
Amenity greenspaces

Amenity greenspaces (see **Diagram D1.9**) predominantly provide opportunities for formal outdoor sports and recreation that contribute to people's health and well-being. Examples within the study area include formal amenity greenspaces associated with sports facilities (such as The Island Recreation Ground in Usk), and a range of more informal amenity greenspaces and play spaces in urban areas such as Stuart Avenue Open Space in Chepstow, and Tudor Road Open Space in Monmouth.

Zone	Sports Playing Field*	Play Space*
Gwent Levels	15	41
Wye Valley	7	5
Usk Catchment	23	36
Wye Catchment	5	12
Brecon Beacons Uplands	4	6
Monmouthshire	53	100

*Nb - numbers taken from Ordnance Survey Greenspace data. Diagram D1.5 includes both Ordnance Survey Greenspace data, and data from the Monmouthshire Open Space Study, 2008

DIAGRAM D1.9 Amenity Greenspace

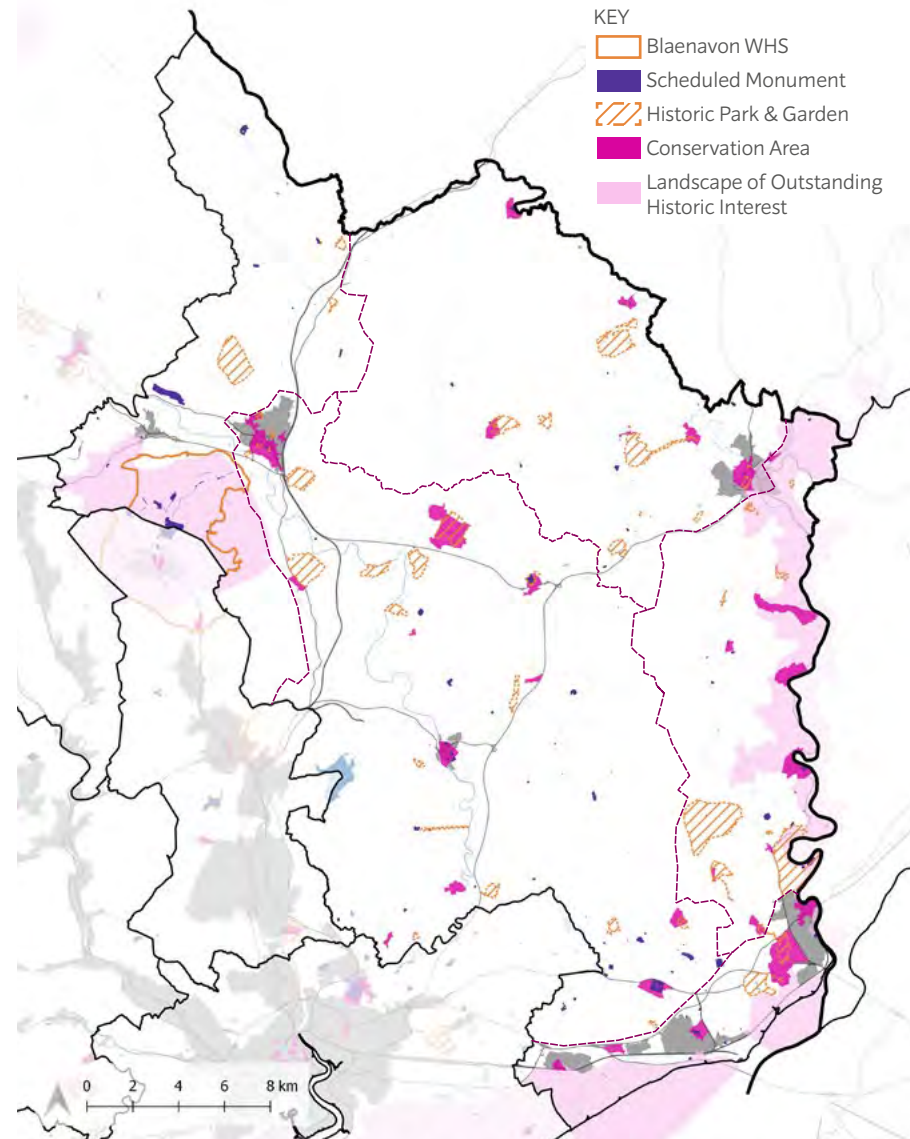


Heritage Sites

Heritage sites (see **Diagram D1.10**) can provide opportunities for informal recreation and intellectual access to history that contributes to people's health and well-being. Examples in Monmouthshire include scheduled monuments such as Caldicot Castle and Tintern Abbey, as well as historic landscapes associated with the Blaenavon Industrial Landscape World Heritage Site, the Gwent Levels, and the Wye Valley.

Zone	Scheduled Monuments	Historic Parks & Gardens	Conservation Areas	Landscape of Outstanding Historic Interest
A: Gwent Levels	27	4	6	1,575 Ha
B: Wye Valley	43	10	8	3,474 Ha
C: Usk Catchment	66	20	12	56 Ha
D: Wye Catchment	29	12	7	217 Ha
E: Brecon Beacons Uplands	37	4	1	2,701 Ha
Monmouthshire	200	49	31	8,023 Ha

DIAGRAM D1.10 Heritage Sites



d2

Ecosystem Services Assessment

General

The GI assets identified in **Appendix D1** provide a wide range of benefits to society derived from the functions or ecosystems services that they provide.

A summary of the ecosystem services provided by the GI assets in each zone within Monmouthshire is described below. These form the basis for identifying needs and opportunities for the GI Strategy.

DIAGRAM D2.1 Geology

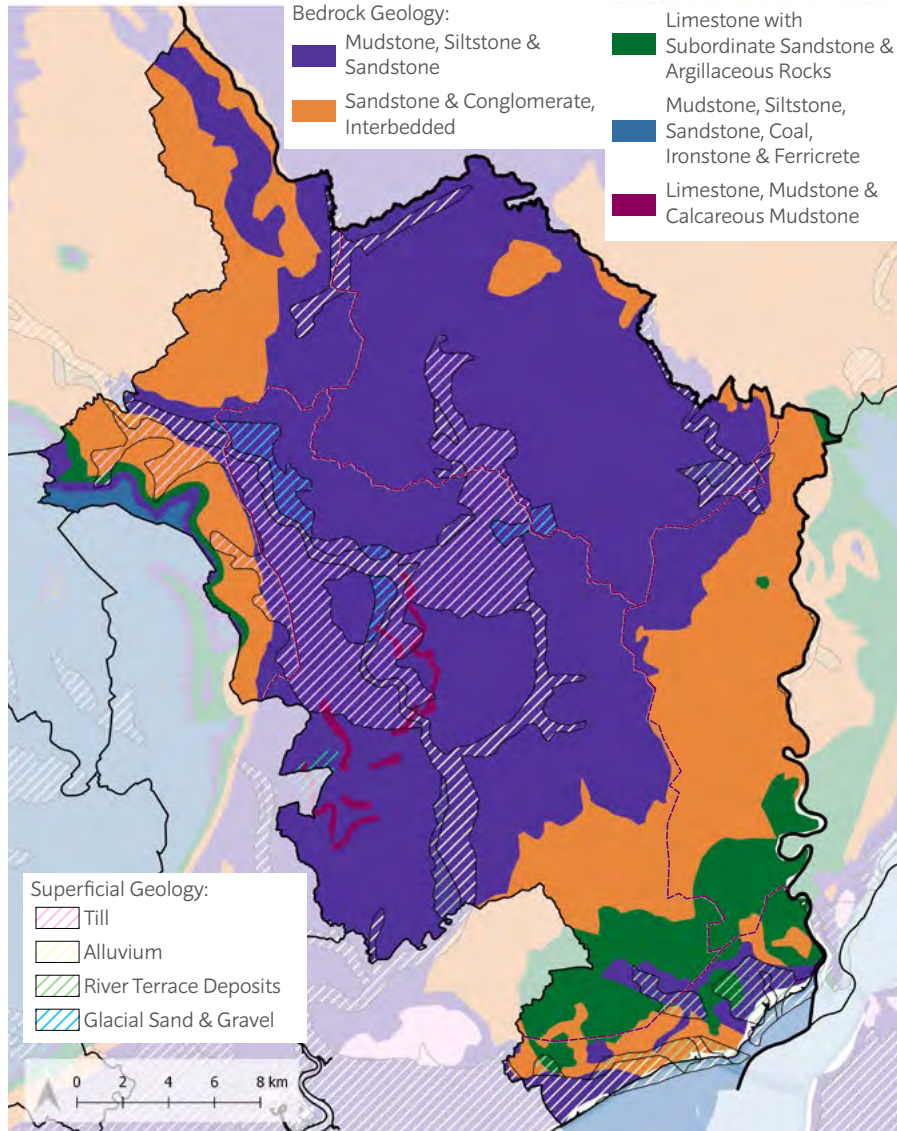
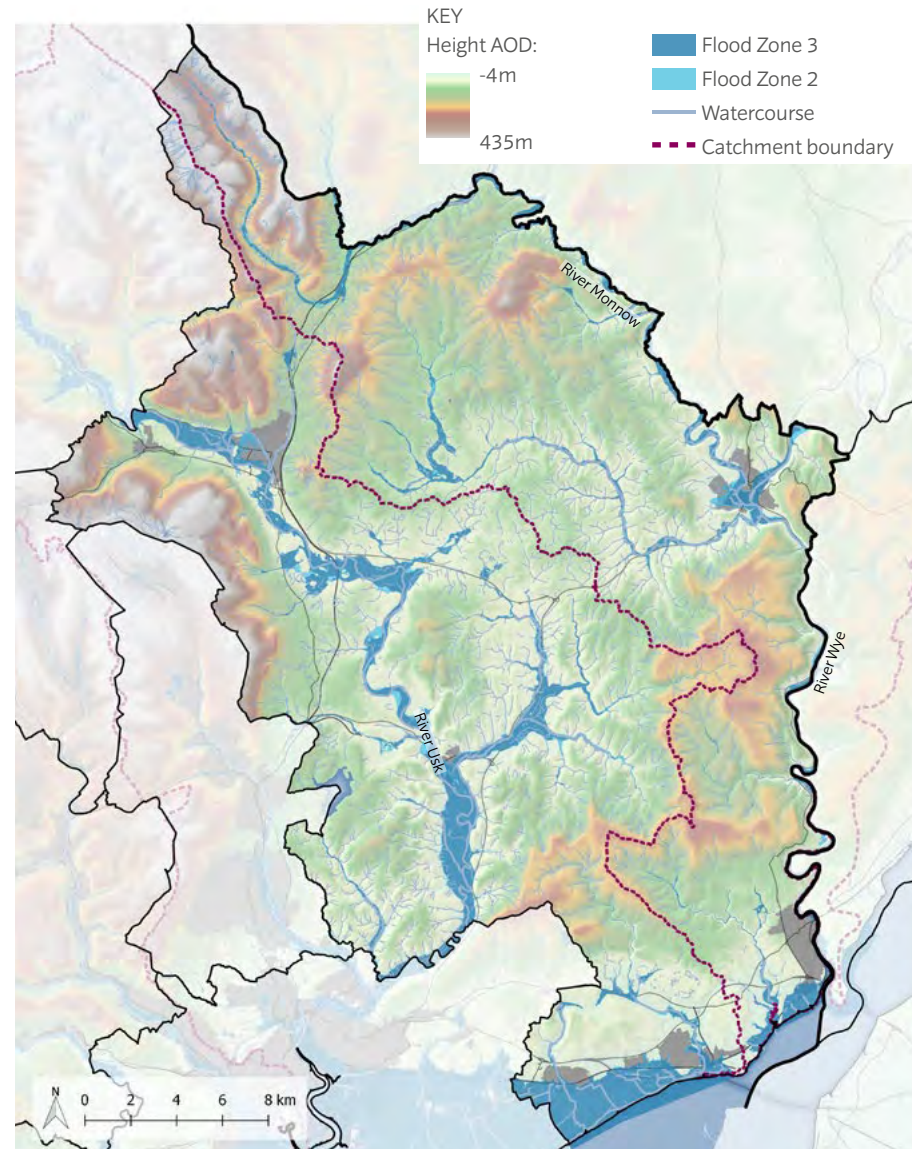


DIAGRAM D2.2 Topography & Hydrology



Zone A: Gwent Levels

Supporting Services

Supporting services are those which are essential to the functioning of ecosystems and indirectly responsible for all other services. This includes the relationship between underlying geology and soil character, soil formation and the processes of plant growth, including pollination.

Geology and soil character: The northern edge of the Gwent Levels is marked by the boundary between the slightly higher ground in the north, underlain by sedimentary rocks mainly of Lower Old Red sandstone age, and the lower, flatter land on reclaimed estuarine alluvium to the south (see **Diagram D2.1**). The estuarine alluvium is mainly a bluegrey, silty mud up to 13 metres thick that gives rise to heavy textured, poorly drained clayey soils. There are also some localised areas of peaty soils, such as south of Magor. These most commonly occur as a layer of peat covered by clayey topsoil, but where the soft black peat extends to the surface these areas are particularly wet.

Soil formation: In the context of the Gwent Levels, supporting services relate to the exchange of silts and nutrients between the reed system and the agricultural land. This interchange relies heavily on the regulation of water management and cyclical ditch management. The supply and replenishment of nutrients maintains soils, primary production (including agricultural productivity), as well as providing the basis for supporting the nature conservation value of the Gwent Levels.

Pollination: by insects also provides a supporting service for primary production to support both agricultural production and nature conservation. However, the serious consequences of significant declines in insect pollinator populations, considered largely to result from the loss of flower-rich habitat, habitat fragmentation and the use of certain pesticides, has been recognised in the government's National Pollinator Strategy¹ and the creation of initiatives such as B-Lines² to promote landscape-scale habitat creation to try and reverse the decline in pollinating insects.

With respect to Monmouthshire as a whole, the green infrastructure action plan for pollinators in SE Wales³ identifies those areas where pollinators directly contribute to supporting human life and food, notably where there is the high demand in urban areas for pollinators for fruit and vegetables in gardens and allotments. The action plan also points out that there is only a relatively small percentage of arable land that comprises crops such as oilseed rape which need pollinators, and this is concentrated in the lowland arable areas of Monmouthshire. Other areas such as, for example, nature reserves, have indirect requirements for pollinators.

The Action Plan provides a framework for identifying appropriate areas and types of land where interventions to support pollinators could be delivered, and provides a variety of recommendations and desired outcomes for measuring success. In terms of broad measures of success, the Action Plan reports a success rate of approximately 90% for the use of yellow rattle as a means of reducing the vigour of grass growth (thereby allowing a more floristically rich sward to develop) and it also identifies the inter-relationship between the County's 'cut and collect' grass mowing regime for maintaining grasslands (e.g. roadside verges), which is a key management tool in maintaining floral diversity, and the generation of biomass for energy production.

³ TACP (2015). Green infrastructure action plan for pollinators in South-east Wales. Report to Monmouthshire County Council on behalf of Monmouthshire County Council and Blaenau Gwent, Caerphilly and Torfaen County Borough Councils December 2015. TACP UK Ltd.

¹ Defra (November 2014). The National Pollinator Strategy: for bees and other pollinators in England.

² <https://www.buglife.org.uk/campaigns-and-our-work/habitat-projects/b-lines>

Provisioning Services

Provisioning services relate to the supply of goods such as freshwater, food and fuel.

Water availability: The Gwent Levels is largely a rain-fed system, with relatively limited inputs from river discharge. Water availability therefore largely relies on the relationship between rainfall inputs and the active management of water levels through the control structures that moderate flows and discharges. The abundance of water is key to maintaining the character and function of the area. The main abstractions are for public water supply; other abstractions are for industry and agriculture.

Food provision: The area primarily produces beef, milk and other dairy products, with some sheep flocks and arable production. A small number of traditional orchards of apples and pears are present. The extent to which the Gwent Levels remains a productive landscape is variable and is influenced by farm size, landholdings purchased for non-farming reasons, diversification of business activities that may include wind and solar power generation, holiday lets or similar and the separation between pasture on the Levels and the holdings that operate them.

All of these factors influence productivity and, importantly, how separate land parcels are managed in a landscape that requires a coherent approach to, for example, land drainage.

Fuel and fibre: There is limited potential for some biomass production from willow pollards, which has a longstanding tradition throughout the area. However, the volume of biomass that could realistically be harvested may restrict the size of any associated power plant. As an alternative the biomass could form one stream of supply to an existing plant, but the value of this would need to be considered in relation to the embedded energy costs associated with transportation. Other sources of renewable energy generation on the Gwent Levels include wind turbines and solar arrays. However, both these sources

of power give rise to other considerations that include land take, drainage management and visual impacts associated with the introduction of prominent structures into the landscape.

The Renewable Energy Community Scheme (RECS)⁴ has recently completed a feasibility study to consider the inter-relationship between small-scale 'green' energy generation and natural floodplain management to control surface water flooding. The feasibility study has been undertaken around Monmouth, but its key findings are intended to be applicable county-wide. The aims of the project were to:

- Identify acreage suitable for woodland planting which, with sustainable management provide fuel for community heating schemes, the contribution these plantings would make to the reduction of surface water run-off, any land management that would assist in additional reduction of surface water run-off;
- Advise on the contribution to the reduction of surface water run-off from community orchards; and,
- Identify suitable watercourses for the installation of micro hydro schemes with the direct benefit of providing power for local community use.

The Feasibility Study has also created a RECS 'Effectiveness Calculator', which estimates the reduction in run-off and flashiness of a run-off event that could result from a particular action or intervention, based on a suite of site specific data.

⁴ <http://monmouthshire.biz/project/renewable-energy-community-schemes-recs/>

Regulating Services

Regulating services maintain natural systems that include water quality flooding, soil erosion and coastal processes.

Climate regulation: There is limited carbon storage in the Gwent Levels predominantly due to the limited areas of peat soils. The majority of the Levels comprise loams derived from reclaimed estuarine alluvium.

Regulating water quality: The Gwent Levels, and the rivers that drain through it, fall within the Severn River Basin District. The 2015 River Basin Management Plan⁵ identifies a range of factors that are detrimental to water quality, notably phosphate loads and poor soil management (leading to excessive overland flow/ sediment loss to water) in the River Wye catchment⁶.

Point source pollution from development and industry is also an influence on water quality. The water quality within the ditch and reen system of the Gwent Levels is considered to reflect the low flow and significant organic loading associated with the setting. During the summer months, natural organic degradation results in significant nutrient enrichment. The high productivity and low/absent flow also result in low levels of dissolved oxygen and elevated Biological Oxygen Demand (BOD) compared with other rivers. The regulation of water quality on the Levels is therefore largely determined by the control of urban and agricultural diffuse pollution and the management of the reen system.

Regulating water (flooding): The Gwent Levels are largely a rain fed system and although the rivers have been artificially modified to increase flows to the sea, they have only a limited influence on water levels (see **Diagram D2.2**). Nevertheless, Local Plan⁷ policies (e.g. Policy SD3) provide specific requirements for surface water drainage relating to the management of surface water runoff

5 Environment Agency (December 2015). Part 1: Severn River Basin District River Basin Management Plan. On behalf of Defra, Welsh Government, Natural Resources Wales and Environment Agency.

6 Environment Agency (December 2015). Part 1: Severn River Basin District River Basin Management Plan. On behalf of Defra, Welsh Government, Natural Resources Wales and Environment Agency.

7 Monmouthshire County Council Adopted Local Development Plan 2011-2021 (Adopted February 2014)

from development, to manage flood risk from the landward side. The seawall, in combination with the maintenance of the ditch and reen network, is the primary means for regulating flows and preventing flooding to communities including Caldicot, Magor & Undy, Rogiet and Mathern, maintaining agricultural productivity and protecting the ecological interest of the Gwent Levels.

Regulating soil erosion and quality: Intensive and repeated cultivation and arable cropping increase the stress placed upon soils, and may lead to a reduction in soil quality and condition. Similarly, inappropriate livestock management can lead to poaching and erosion of surface vegetation and soils. Consequently, some areas suffer from damaged soil structure, notably compaction and impeded drainage which accelerates run-off or prolongs periods of standing water, which can impact vegetation and lead to soil exposures, which can increase sedimentation of watercourses.

Regulating coastal processes: The Gwent Levels within Monmouthshire comprise c.17.75km² of reclaimed estuarine alluvium, forming a coastal plain up to 3.7km wide, fringing the northern side of the Severn Estuary. The Levels have been totally hand-crafted by humans, created through the enclosing and draining of tidal saltmarshes, and are still dominated today by the need to manage water. Without the sea wall, the Gwent Levels would be frequently inundated by the sea. The alignment of the sea defences is dynamic and has historically moved since Roman times. Climate change is likely to increase tidal flood risk; this will be exacerbated in low-lying areas where increased sea levels inhibit pumped land drainage. Tidal inundation within coastal areas could result in saline intrusion (although this is currently not an issue) into freshwater bodies, most of which are recognised for their nature conservation interest in SSSI designations and depend on fresh water. Coastal processes throughout the estuary are dynamic and of considerable importance, both within the estuary and to the low-lying adjacent land. The current policy for flood defences along the coast bordering the Gwent Levels is to 'hold the line'⁸.

8 Severn Estuary Coastal Group (2016). Severn Estuary Shoreline Management Plan Review. The Shoreline Management Plan: Part B (Main Report) – Policy Statements. Report prepared by Atkins on behalf of SEGG.

Cultural Services

Cultural services provide direct, non-material, benefits to human society, addressing a range of social and cultural needs that encompass a sense of place and inspiration, a sense of history, tranquillity and recreation.

Sense of place and inspiration: The Gwent Levels landscape is perceived by different people in different ways. Some can find it featureless and intimidating, whereas others find it exhilarating and inspiring, valuing its strong sense of tranquillity and history, distinctive lifestyles and opportunities for recreation. The key qualities identified by the Landscape Character Assessment that give the Gwent Levels its unique sense of place are:

- The low horizon, level topography and broad skies, often augmented by dramatic cloudscapes, sunsets and sunrises.
- Strong linearity and distinctive geometric pattern of enclosure, drainage, watercourses, lanes and historic route-ways.
- Distinctive drainage pattern of canalised rivers, drains, reens and ditches, accentuated by lines of pollard willows.
- The sea wall, and banks carrying roads/droeways between farmsteads and villages, often form the only upstanding landscape features in some places.
- The large assemblages of waterfowl and waders that visit the coastal mudflats and wetlands, and the vast flocks -murmurations - of starlings gathering on the Levels in autumn and winter forming mesmeric and dramatic aerial displays.
- A sparse settlement pattern related to subtle topographical variations, the simple and utilitarian style of buildings often reflecting the functional nature of the landscape.

- In summer, a verdant and fertile landscape with lush vegetation across meadows and along watercourses; this contrasts with the often wild, bleak and sense of remoteness experienced on the Levels in winter.
- Vibrant cities and towns around the edge of the Levels reinforce its strong sense of tranquillity, remoteness and wildness away from human occupation in many places.

Sense of history: The Gwent Levels is a Historic Landscape of Outstanding Historic Interest. It is a landscape of extraordinarily diverse environmental and archaeological potential. Although they are an important wetland resource in their own right, archaeologically the area contains a variety of landscapes of different dates, and nowhere else is it possible to make the period distinctions so easily. Having been reclaimed from the sea at various times during the historic period, the present land surface is a supreme example of a 'hand-crafted' landscape, artificially created and entirely the work of humans, preserving clear evidence of distinctive patterns of settlement, enclosure and drainage systems. However, because of recurrent phases of inundation and alluviation, there is also a proven, and quite possibly vast, potential for extensive, buried, waterlogged, archaeological and palaeoenvironmental deposits belonging to the earlier landscapes, which extend beyond the seawalls and banks into the intertidal mudflats. The Levels are therefore a uniquely rich archaeological and historical resource in Wales, and certainly of international importance and significance.

Leisure and Recreation: The Gwent Levels landscape provides a range of outdoor leisure and recreation activities for local communities and visitors, in particular walking, cycling and bird-watching. Facilities and destinations include promoted recreational routes such as the Wales Coast Path; country parks (for example Caldicot Castle); nature reserves including Magor Marsh and Great Traston Meadows as well as a number of villages including Magor/Undy. Angling, particularly off the seawall, is a common activity. Wildfowling is also active on the Levels.

Zone B: Wye Valley

Supporting Services

Supporting services are those which are essential to the functioning of ecosystems and indirectly responsible for all other services. This includes the relationship between underlying geology and soil character, soil formation and the processes of plant growth, including pollination.

Geology and soil character: The bedrock geology of the Wye Valley GI Zone is dominated by rocks ranging from Lower Devonian to Lower Carboniferous and record sedimentation in both terrestrial and marine environments (see **Diagram D2.1**). The Carboniferous sequence comprises a range of different lithologies including shale, sandstone, oolitic limestone and dolomite. Between Monmouth and Chepstow, the modern River Wye occupies a spectacular, deeply-incised meandering gorge. A remarkable feature of the reach is that although the gorge is entrenched to a depth of up to 200m, its meandering course displays no relationship to the geological structure, although it is likely that incision was enhanced by joint systems in the Palaeozoic bedrock⁹.

Soil formation: The agricultural land of the Wye Valley GI Zone overlies relatively well draining brown earth soils and, as a consequence, there is a noticeable scarcity of marshy grassland/rush pasture⁷.

Pollination: by insects also provides a supporting service for primary production to support both agricultural production and nature conservation. However, the serious consequences of significant declines in insect pollinator populations, considered largely to result from the loss of flower-rich habitat, habitat fragmentation and the use of certain pesticides, has been recognised in the government's National Pollinator Strategy¹⁰ and the creation of initiatives such as B-Lines¹¹ to promote landscape-scale habitat creation to try and reverse the decline in pollinating insects.

⁹ NRW (2014) Wye Valley and Wentwood NLCA (NLCA 32)

¹⁰ Defra (November 2014). The National Pollinator Strategy: for bees and other pollinators in England.

¹¹ <https://www.buglife.org.uk/campaigns-and-our-work/habitat-projects/b-lines>

With respect to Monmouthshire as a whole, the green infrastructure action plan for pollinators in SE Wales¹² identifies those areas where pollinators directly contribute to supporting human life and food, notably where there is the high demand in urban areas for pollinators for fruit and vegetables in gardens and allotments. The action plan also points out that there is only a relatively small percentage of arable land that comprises crops such as oilseed rape which need pollinators, and this is concentrated in the lowland arable areas of Monmouthshire. Other areas such as, for example, nature reserves, have indirect requirements for pollinators.

The Action Plan provides a framework for identifying appropriate areas and types of land where interventions to support pollinators could be delivered, and provides a variety of recommendations and desired outcomes for measuring success. In terms of broad measures of success, the Action Plan reports a success rate of approximately 90% for the use of yellow rattle as a means of reducing the vigour of grass growth (thereby allowing a more floristically rich sward to develop) and it also identifies the inter-relationship between the County's 'cut and collect' grass mowing regime for maintaining grasslands (e.g. roadside verges), which is a key management tool in maintaining floral diversity, and the generation of biomass for energy production. With specific reference to the Wye Valley GI Zone, the Action Plan broadly identifies high grassland species diversity along the Wye Valley and urban areas, with lower diversity in the uplands and in the intensive agricultural areas. There are also currently bee walk transects in Chepstow.

¹² TACP (2015). Green infrastructure action plan for pollinators in South-east Wales. Report to Monmouthshire County Council on behalf of Monmouthshire County Council and Blaenau Gwent, Caerphilly and Torfaen County Borough Councils December 2015. TACP UK Ltd.

Provisioning Services

Provisioning services relate to the supply of goods such as freshwater, food and fuel.

Water availability: The Wye catchment area comprises the River Wye and a number of substantial tributaries, including the Monnow which runs along the northern boundary of the county. The River Wye is the sixth largest river in the UK, with a total catchment area of 4,171km² spanning both England and Wales; approximately 10% of the catchment falls within Monmouthshire. The river is tidal for approximately 23km (14 miles) from the tidal limit at Bigsweir Bridge to Chepstow where it flows into the Severn Estuary. The annual average rainfall across the area varies between 2,200mm in the mountainous headwaters (outside Monmouthshire), to 700mm in the lower catchment. The lower Wye catchment, including Monmouthshire, has slightly permeable geology with groundwater providing a contribution to river flow. The River Wye is known as a 'regulated river'. Water is released from the Elan Valley Reservoirs in Mid-Wales to support public water supply and other abstractions in the lower reaches of the Wye, when flows fall below a certain threshold.

Food provision: Away from the Wye gorge, the area is characterised by low-lying, gently rolling farmland with much of the land being dominated by agriculturally improved, livestock grassland together with a significant element of arable farming on more fertile soils.

Fuel & fibre: In some parts of the county there is limited potential for some biomass production from willow pollards, particularly along main river courses and within the floodplains. More generally, the wooded character of Monmouthshire in general, and the Wye Valley in particular, also provide opportunities for wood fuel production either through the use of its extensive plantation forestry or as a by-product of other forest industry. However, the volume of biomass that could realistically be harvested may restrict the size of any associated power plant. As an alternative the biomass could form one stream of supply to an existing plant, but the value of this would

need to be considered in relation to the embedded energy costs associated with transportation. Other sources of renewable energy generation in Monmouthshire generally include wind turbines and solar arrays. However, both these sources of power give rise to other considerations that include land take, drainage management and visual impacts associated with the introduction of prominent structures into the landscape.

The Renewable Energy Community Scheme¹³ (RECS) has recently completed a feasibility study to consider the inter-relationship between small-scale 'green' energy generation and natural floodplain management to control surface water flooding. The feasibility study has been undertaken around Monmouth, but its key findings are intended to be applicable county-wide. The aims of the project were to:

- Identify acreage suitable for woodland planting which, with sustainable management provide fuel for community heating schemes, the contribution these plantings would make to the reduction of surface water run-off, any land management that would assist in additional reduction of surface water run-off;
- Advise on the contribution to the reduction of surface water run-off from community orchards; and,
- Identify suitable watercourses for the installation of micro hydro schemes with the direct benefit of providing power for local community use.

The Feasibility Study has also created a RECS 'Effectiveness Calculator', which estimates the reduction in run-off and flashiness of a run-off event that could result from a particular action or intervention, based on a suite of site specific data.

¹³ <http://monmouthshire.biz/project/renewable-energy-community-schemes-recs/>

Regulating Services

Regulating services maintain natural systems that include water quality, flooding, soil erosion and coastal processes.

Climate regulation: Climate change is predicted to affect the amount and distribution of rainfall; this has an impact on flows and water levels, drought and flood events. Work carried out in 2002 showed that by 2050 river flows in winter may rise by 10-15% but in the summer and early autumn could reduce by over 50% and as much as 80% in some places. As a consequence, droughts and flood events may become more common. Climate change may affect groundwater recharge. By 2025 it is likely that groundwater recharge will decrease, resulting in decreased dry weather river flows and a general lowering of groundwater levels. This may have impacts on base-flow to rivers and wetlands in dry periods and affect small domestic and agricultural water supplies. Further evidence has identified risks to aquifers and habitats from salt water intrusion¹⁴.

Regulating water quality: The River is predominantly rural in nature; agriculture dominates with arable, dairy and sheep farms on generally sandy silty soils prone to erosion, particularly within its upper reaches. A variety of management initiatives have been identified to maintain and improve water quality, including:

- The use of buffer strips to control and regulate the deposition of silt into watercourses and control erosion;
- Improvements to water treatment and restrictions on groundwater abstraction;
- Increases in winter storage reservoirs;
- Use of SuDS and river buffer zones to reduce flooding, soil and nutrient loss;
- Provision of habitat such as buffer strips, fish passes, improvements to riverbank condition;

- Improvements in water quality to support recreation and tourism;
- Reduction in the use of fertilizers to no more than is needed, to protect groundwater aquifers.

Regulating water (flooding): The Wye catchment has a wide variation of fluvial flooding issues ranging from extended periods of elevated levels within the River Wye Valley that affect many communities, flooding from tributaries of the River Wye, flooding from quickly responding catchments and tidal flooding from the Severn Estuary (see **Diagram D2.2**). In addition climate change is likely to increase the pressure on existing locations where surface water/sewer flooding occurs. The greatest threat to the lower catchment is from sea level rise which could increase flood risk significantly in Chepstow and surrounding low-lying areas.

Environmental Objectives for the management of flood risk include:

- Restoration of sustainable natural storage of floodwater in the upstream area, in order to offset increasing flood risk from trends including climate change;
- Improving the water environment through flood risk management activities;
- Improving the hydro-morphology of rivers;
- Minimising impacts of flooding on designated sites or areas of environmental interest; and,
- Habitat creation through flood risk management activities.

¹⁴ The State of Natural Resources Report (SoNaRR): Assessment of the Sustainable Management of Natural Resources. Technical Report. Natural Resources Wales.

Regulating soil erosion and quality: The soils of best quality and most productive agricultural land are a scarce and finite resource in Wales; accounting for less than 7% of land area. Soil quality has deteriorated across all habitats apart from woodlands where there has been some improvement. The severity and spatial extent of soil erosion has not been directly quantified in Wales. Around 10-15% of grassland fields in (England and) Wales are thought to be affected by severe soil compaction and 50-60% are in moderate condition. No data exists on compaction in grassland and arable land across Wales specifically. Topsoil carbon concentrations are generally stable and there is ongoing recovery from soil acidification. Although a significant decline in soil phosphorus levels has been seen for Improved Land, it remains above the optimum levels in many (44%) agricultural fields. Soil invertebrate (mesofauna) numbers indicate no overall trend. There has been little or no decline in elevated levels of soil contaminants from industry and transport. The UK Climate Change Risk Assessment 2017 Evidence Report¹⁵ has identified risks to soils from increased seasonal aridity and wetness. Climate change related risks are threatening the many services that soils provide, notably those that relate to soil biota, soil organic matter, and soil erosion and compaction.

Regulating coastal processes: The role the River Wye plays in regulating coastal process is addressed in relation to The Gwent Levels.

¹⁵ Committee on Climate Change. 2016. UK Climate Change Risk Assessment 2017 Evidence Report, Summary for Wales [online]. Available from: <https://documents.theccc.org.uk/wp-content/uploads/2016/07/UK-CCRA-2017-Wales-National-Summary.pdf>.

Cultural Services

Cultural services provide direct, non-material, benefits to human society, addressing a range of social and cultural needs that encompass a sense of place and inspiration, a sense of history, tranquillity and recreation.

Sense of place and inspiration: In the Wye Valley special qualities identified include 'picturesque, extensive and dramatic views' and 'overall sense of tranquillity, sense of remoteness and naturalness/wildness'. This is an enclosed landscape, covered by the wooded high ground where, in its southern reaches, the River Wye is hidden by high cliffs.

Sense of history: The Wye Valley is acknowledged to be one of the most scenically attractive lowland landscapes in Britain, and one of the few lowland Areas of Outstanding Natural Beauty. It is also one of the few remaining areas with comparatively large tracts of ancient broadleaved woodlands, whilst the pastures, hay meadows, hedges and copses of the farmed landscape in and around the valley are also rich natural habitats with historical significance. In 1770, the scenic qualities of the valley inspired the Reverend William Gilpin to write his important treatise on the notion and depiction of landscape as the Picturesque. Along with its artistic associations, the valley also has a rich archaeological legacy, from the prehistoric to the recent past, reflecting its importance as a communication route, a natural and political boundary, and a centre of religious life and of several early industries.

Leisure and recreation: The Wye valley is a scenic leisure destination, from Chepstow Castle in the south, via Tintern Abbey and the village of Tintern Parva, to Monmouth, including its unique Monnow Bridge. Although Chepstow offers only limited access to the river, better access is offered at Tintern and Monmouth. More generally, however, the geology of the Wye Valley and the River Wye itself provide opportunities for leisure activities that include: canoeing, climbing, caving, as well as walking, cycling and horse riding through the area's extensive woodlands, whilst the Wye Valley River Festival and The Green Gathering at Chepstow provide a focus for the arts and culture.

Zone C: Usk Catchment

Supporting Services

Supporting services are those which are essential to the functioning of ecosystems and indirectly responsible for all other services. This includes the relationship between underlying geology and soil character, soil formation and the processes of plant growth, including pollination.

Geology and soil character: The central area between the River Usk and Monmouth is Silurian mudstones and shales surrounded by a large band of earlier, Devonian Old Red Sandstone (see **Diagram D2.1**). Morainic drift and boulder clay give rise to the fertile alluvial deposits that are key to the agricultural productivity in this rural area.

Soil formation: Geology has produced mainly well-drained, coarse loamy and sandy soils surrounded by finer silty soils over the shales, silts and sandstones¹⁶.

Pollination: by insects also provides a supporting service for primary production to support both agricultural production and nature conservation. However, the serious consequences of significant declines in insect pollinator populations, considered largely to result from the loss of flower-rich habitat, habitat fragmentation and the use of certain pesticides, has been recognised in the government's National Pollinator Strategy and the creation of initiatives such as B-Lines to promote landscape-scale habitat creation to try and reverse the decline in pollinating insects.

With respect to Monmouthshire as a whole, the green infrastructure action plan for pollinators in SE Wales¹⁷ identifies those areas where pollinators directly contribute to supporting human life and food, notably where there is the high demand in urban areas for pollinators for fruit and vegetables in gardens and allotments. The action plan also points out that there is only a relatively small percentage of arable land that comprises crops such as oilseed rape which need pollinators, and this is concentrated in the lowland arable areas of

Monmouthshire. Other areas such as, for example, nature reserves, have indirect requirements for pollinators.

The Action Plan provides a framework for identifying appropriate areas and types of land where interventions to support pollinators could be delivered, and provides a variety of recommendations and desired outcomes for measuring success. In terms of broad measures of success, the Action Plan reports a success rate of approximately 90% for the use of yellow rattle as a means of reducing the vigour of grass growth (thereby allowing a more floristically rich sward to develop) and it also identifies the inter-relationship between the County's 'cut and collect' grass mowing regime for maintaining grasslands (e.g. roadside verges), which is a key management tool in maintaining floral diversity, and the generation of biomass for energy production. With specific reference to the Usk catchment, the Action Plan broadly identifies high grassland species diversity along parts of the Usk floodplain and urban areas, with lower diversity in the uplands and in the intensive agricultural areas. There are also currently bee walk transects in Usk.

¹⁶ NRW (2015) Central Monmouthshire NLCA (NLCA 31)

¹⁷ TACP (2015). Green infrastructure action plan for pollinators in South-east Wales. Report to Monmouthshire County Council on behalf of Monmouthshire County Council and Blaenau Gwent, Caerphilly and Torfaen County Borough Councils December 2015. TACP UK Ltd.

Provisioning Services

Provisioning services relate to the supply of goods such as freshwater, food and fuel.

Water availability: The Usk area extends outside the county from the Brecon Beacons in the north to the low-lying agricultural land in the south. It includes the River Usk and its tributaries. The River Usk is approximately 121km long and the total catchment size 1,169km², with approximately 30% of the catchment falling within Monmouthshire. The climate is mild and wet, receiving an annual average rainfall of 1,700mm in the uplands and 1,100mm in the lowlands (compared with 1,310mm for Wales as a whole). The headwaters and some of its tributaries are modified by dams to create the Usk, Crai, Talybont and Grwyne Fawr reservoirs. At Brecon some of the river's flow is diverted to feed the Monmouthshire and Brecon Canal and water from the lower River Usk is pumped to Llandegvedd water storage reservoir ¹⁸.

Food provision: Much of the central and southern parts of Monmouthshire are utilised for sheep grazing and dairy farming, with some smaller areas of arable farming on the fertile floodplain where good drainage allows. A small number of traditional orchards are present. In the northwest of the county, higher land, much of which are commons, tends to be sheep grazed, with small scale enclosed sheep and dairy pasture on the lower slopes and valleys. Some localised areas of farmland have been turned over to other uses, including diversification of business activities such as solar or wind power generation. These diversifying factors can influence productivity and, importantly, how separate land parcels are managed in a landscape that requires a coherent approach to, for example, land drainage. Abergavenny maintains a livestock market.

Fuel & fibre: In some parts of the county there is limited potential for some biomass production from willow pollards, particularly along main river courses and within the floodplains. The wooded character of Monmouthshire in general may also provide opportunities for wood fuel production as a by-product of

¹⁸ Environment Agency (December 2015). Part 1: Severn River Basin District River Basin Management Plan. On behalf of Defra, Welsh Government, Natural Resources Wales and Environment Agency.

other forest industry. However, the volume of biomass that could realistically be harvested may restrict the size of any associated power plant. As an alternative the biomass could form one stream of supply to an existing plant, but the value of this would need to be considered in relation to the embedded energy costs associated with transportation. Other sources of renewable energy generation in Monmouthshire include wind turbines and solar arrays (e.g. the solar farm development at Llancayo in the Usk Valley). However, both these sources of power give rise to other considerations that include land take, drainage management and visual impacts associated with the introduction of prominent structures into the landscape.

The Renewable Energy Community Scheme¹⁹ (RECS) has recently completed a feasibility study to consider the inter-relationship between small-scale 'green' energy generation and natural floodplain management to control surface water flooding. The feasibility study has been undertaken around Monmouth, but its key findings are intended to be applicable county-wide. The aims of the project were to:

- Identify acreage suitable for woodland planting which, with sustainable management provide fuel for community heating schemes, the contribution these plantings would make to the reduction of surface water run-off, any land management that would assist in additional reduction of surface water run-off;
- Advise on the contribution to the reduction of surface water run-off from community orchards; and,
- Identify suitable watercourses for the installation of micro hydro schemes with the direct benefit of providing power for local community use.

The Feasibility Study has also created a RECS 'Effectiveness Calculator', which estimates the reduction in run-off and flashiness of a run-off event that could result from a particular action or intervention, based on a suite of site specific data.

¹⁹ <http://monmouthshire.biz/project/renewable-energy-community-schemes-recs/>

Regulating Services

Regulating services maintain natural systems that include water quality, flooding, soil erosion and coastal processes.

Climate regulation: Climate change is predicted to affect the amount and distribution of rainfall; this has an impact on flows and water levels, drought and flood events. Work carried out in 2002 showed that by 2050 river flows in winter may rise by 10-15% but in the summer and early autumn could reduce by over 50% and as much as 80% in some places. As a consequence, droughts and flood events may become more common. Climate change may affect groundwater recharge. By 2025 it is likely that groundwater recharge will decrease, resulting in decreased dry weather river flows and a general lowering of groundwater levels. This may have impacts on base-flow to rivers and wetlands in dry periods and affect small domestic and agricultural water supplies. Further evidence has identified risks to aquifers and habitats from salt water intrusion.

Regulating water quality: Land is predominantly used for agriculture, with sheep farming in the northern and western uplands, and beef, dairy, mixed and arable farming in the lowlands of the south and east. As a result, pollution from rural sources is considered a major threat to the ecological quality of the water environment. There is some limited industry in the major towns. Pollution from sewage and contaminated run-off is a pressure in the urban areas. As a consequence, the 2015 Severn River Basin Management Plan²⁰ identifies a range of factors that are detrimental to water quality and biodiversity within the Usk catchment. Most notably, this relates to discharges of diffuse pollution from agriculture and rural land management in general, diffuse pollution from urban areas, misconnections and development pressure²¹.

Regulating water (flooding): The upper part of the Usk catchment, into the Brecon Beacons, demonstrates a flow regime with rapid rainfall runoff, caused by the steep sided narrow valleys and thin soils underlain by mainly impermeable rock; resulting in the lower reach floodplains becoming inundated

during periods of heavy rainfall (see **Diagram D2.2**). The lower Usk tends to be less responsive to rainfall due to the larger catchment area and lowland relief. Objectives to reduce flooding set out in Monmouthshire's Flood Risk Management Plan which relate to the Usk catchment, include:

- Sustainable and Strategic Development Planning requiring proposals to demonstrate that they can be both protected from, and not exacerbate, flood events;
- Improved soils, reduction in soil wash off land and increased soil permeability.
- Water Cycle Strategy to facilitate sustainable development;
- The expectation that future development will incorporate Sustainable Urban Drainage Systems (SUDs) into their design to reduce surface water run-off and minimise its contribution to flood risk elsewhere;
- Encouraging sustainable land management practice to reduce surface water runoff and contamination, as well as the adoption of soil management plans to reduce runoff and improve soil permeability;
- Site restoration that focuses on soft, rather than hard, engineering solutions to create semi-natural environments;
- Environmental enhancements and habitat creation initiatives.

²⁰ Environment Agency (December 2015). Part 1: Severn River Basin District River Basin Management Plan. On behalf of Defra, Welsh Government, Natural Resources Wales and Environment Agency.

²¹ Natural Resources Wales (undated). Usk Management Catchment Summary

Regulating soil erosion and quality: The soils of best quality and most productive agricultural land are a scarce and finite resource in Wales; accounting for less than 7% of land area. Soil quality has deteriorated across all habitats apart from woodlands where there has been some improvement. The severity and spatial extent of soil erosion has not been directly quantified in Wales. Around 10-15% of grassland fields in (England and) Wales are thought to be affected by severe soil compaction and 50-60% are in moderate condition. No data exists on compaction in grassland and arable land across Wales specifically. Topsoil carbon concentrations are generally stable and there is ongoing recovery from soil acidification. Although a significant decline in soil phosphorus levels has been seen for Improved Land, it remains above the optimum levels in many (44%) agricultural fields. Soil invertebrate (mesofauna) numbers indicate no overall trend. There has been little or no decline in elevated levels of soil contaminants from industry and transport. The UK Climate Change Risk Assessment 2017 Evidence Report²² has identified risks to soils from increased seasonal aridity and wetness. Climate change related risks are threatening the many services that soils provide, notably those that relate to soil biota, soil organic matter, and soil erosion and compaction.

²² Committee on Climate Change. 2016. UK Climate Change Risk Assessment 2017 Evidence Report, Summary for Wales [online]. Available from: <https://documents.theccc.org.uk/wp-content/uploads/2016/07/UK-CCRA-2017-Wales-National-Summary.pdf>.

Cultural Services

Cultural services provide direct, non-material, benefits to human society, addressing a range of social and cultural needs that encompass a sense of place and inspiration, a sense of history, tranquillity and recreation.

Sense of place and inspiration: The Usk catchment, as it winds its way between the foothills of the Brecon beacons and Newport and the Severn estuary, passes through wooded rolling countryside comprising predominantly pastoral farmland and small village settlements. Overall, this part of Monmouthshire is fairly tranquil, with large areas categorised in the 2009 tranquil areas assessment as 'undisturbed' (countryside usually free of any substantial disturbance in daytime). The only large settlements within this zone are the towns of Abergavenny and Usk, with their rich historical and cultural associations.

Sense of history: This large area has a varied distribution of archaeological sites and monuments dating back to the prehistoric period. Strategically located Iron Age hillforts on summit tops overlook the Usk valley and accentuate the topography. The richness of the agricultural land led to successive 'colonisations' by a sequence of Roman, Early Christian, Norman and Marcher Lordship societies. The area is rich in mediaeval castles and fortified manors and Medieval churches with distinctive stone crosses²³.

Leisure and recreation: The Usk catchment within Monmouthshire offers opportunities for walking and cycling. The River Usk and its tributaries are noted for their fishing. This area of the County also offers many historical sites and towns to visit. Llandegfedd reservoir offers a variety of water sports and outdoor activities including canoeing, sailing and windsurfing, as well as opportunities for fishing, walking and bird watching. The Raglan music festival is staged annually.

²³ NRW (2015) Central Monmouthshire NLCA (NLCA 31)

Zone D: Wye Catchment

Supporting Services

Supporting services are those which are essential to the functioning of ecosystems and indirectly responsible for all other services. This includes the relationship between underlying geology and soil character, soil formation and the processes of plant growth, including pollination.

Geology and soil character: Fault-aligned vales and glacial deposits give rise to the fertile alluvial deposits that are key to the prosperity of this rural, farmed area. The underlying geology of this area largely comprises Silurian argillaceous mudstones and shales surrounded by Old Red Sandstone from the earlier, Lower Devonian period (see **Diagram D2.1**). These rocks were later folded during the Carboniferous period, and subsequently much faulted as, for example, along the northern margin of the area, where the course of the Monnow valley between Alltynyns and Monmouth Cap is strongly controlled by the east north east-striking Neath Disturbance, a large fault zone which probably lies above a major fracture in basement rocks deep below²⁴.

Soil formation: Geology has produced mainly well-drained, coarse loamy and sandy soils surrounded by finer silty soils over the shales, silts and sandstones.

Pollination: by insects also provides a supporting service for primary production to support both agricultural production and nature conservation. However, the serious consequences of significant declines in insect pollinator populations, considered largely to result from the loss of flower-rich habitat, habitat fragmentation and the use of certain pesticides, has been recognised in the government's National Pollinator Strategy²⁵ and the creation of initiatives such as B-Lines²⁶ to promote landscape-scale habitat creation to try and reverse the decline in pollinating insects.

²⁴ NRW (2015) Central Monmouthshire NLCA (NLCA 31)

²⁵ Defra (November 2014). The National Pollinator Strategy: for bees and other pollinators in England.

²⁶ <https://www.buglife.org.uk/campaigns-and-our-work/habitat-projects/b-lines>

With respect to Monmouthshire as a whole, the green infrastructure action plan for pollinators in SE Wales²⁷ identifies those areas where pollinators directly contribute to supporting human life and food, notably where there is the high demand in urban areas for pollinators for fruit and vegetables in gardens and allotments. The action plan also points out that there is only a relatively small percentage of arable land that comprises crops such as oilseed rape which need pollinators, and this is concentrated in the lowland arable areas of Monmouthshire. Other areas such as, for example, nature reserves, have indirect requirements for pollinators.

The Action Plan provides a framework for identifying appropriate areas and types of land where interventions to support pollinators could be delivered, and provides a variety of recommendations and desired outcomes for measuring success. In terms of broad measures of success, the Action Plan reports a success rate of approximately 90% for the use of yellow rattle as a means of reducing the vigour of grass growth (thereby allowing a more floristically rich sward to develop) and it also identifies the inter-relationship between the County's 'cut and collect' grass mowing regime for maintaining grasslands (e.g. roadside verges), which is a key management tool in maintaining floral diversity, and the generation of biomass for energy production.

²⁷ TACP (2015). Green infrastructure action plan for pollinators in South-east Wales. Report to Monmouthshire County Council on behalf of Monmouthshire County Council and Blaenau Gwent, Caerphilly and Torfaen County Borough Councils December 2015. TACP UK Ltd

Provisioning Services

Provisioning services relate to the supply of goods such as freshwater, food and fuel.

Water availability: The Wye catchment area comprises the River Wye and a number of substantial tributaries, including the Monnow which runs along the northern boundary of the county. The River Wye is the sixth largest river in the UK, with a total catchment area of 4,171 km² spanning both England and Wales; approximately 10% of the catchment falls within Monmouthshire. The river is tidal for approximately 23 km (14 miles) from the tidal limit at Bigsweir Bridge to Chepstow where it flows into the Severn Estuary. The annual average rainfall across the area varies between 2,200 mm in the mountainous headwaters (outside Monmouthshire), to 700 mm in the lower catchment. The lower Wye catchment, including Monmouthshire, has slightly permeable geology with groundwater providing a contribution to river flow. The River Wye is known as a 'regulated river'. Water is released from the Elan Valley Reservoirs in Mid-Wales to support public water supply and other abstractions in the lower reaches of the Wye, when flows fall below a certain threshold.

Food provision: Much of the central and southern parts of Monmouthshire are utilised for sheep grazing and dairy farming, with some smaller areas of arable farming on the fertile floodplain where good drainage allows. A small number of traditional orchards are present. In the northwest of the county, higher land, much of which are commons, tends to be sheep grazed, with small scale enclosed sheep and dairy pasture on the lower slopes and valleys. Some localised areas of farmland have been turned over to other uses, including diversification of business activities such as solar or wind power generation. These diversifying factors can influence productivity and, importantly, how separate land parcels are managed in a landscape that requires a coherent approach to, for example, land drainage.

Fuel & fibre: In some parts of the county there is limited potential for some biomass production from willow pollards, particularly along main river courses and within the floodplains. The wooded character of Monmouthshire generally

may also provide opportunities for wood fuel production as a by-product of other forest industry. However, the volume of biomass that could realistically be harvested may restrict the size of any associated power plant. As an alternative the biomass could form one stream of supply to an existing plant, but the value of this would need to be considered in relation to the embedded energy costs associated with transportation. Other sources of renewable energy generation in Monmouthshire include wind turbines and solar arrays. However, both these sources of power give rise to other considerations that include land take, drainage management and visual impacts associated with the introduction of prominent structures into the landscape.

The Renewable Energy Community Scheme ²⁸ (RECS) has recently completed a feasibility study to consider the inter-relationship between small-scale 'green' energy generation and natural floodplain management to control surface water flooding. The feasibility study has been undertaken around Monmouth, but its key findings are intended to be applicable county-wide. The aims of the project were to:

- Identify acreage suitable for woodland planting which, with sustainable management provide fuel for community heating schemes, the contribution these plantings would make to the reduction of surface water run-off, any land management that would assist in additional reduction of surface water run-off;
- Advise on the contribution to the reduction of surface water run-off from community orchards; and,
- Identify suitable watercourses for the installation of micro hydro schemes with the direct benefit of providing power for local community use.

The Feasibility Study has also created a RECS 'Effectiveness Calculator', which estimates the reduction in run-off and flashiness of a run-off event that could result from a particular action or intervention, based on a suite of site specific data.

²⁸ <http://monmouthshire.biz/project/renewable-energy-community-schemes-recs/>

Regulating Services

Regulating services maintain natural systems that include water quality, flooding, soil erosion and coastal processes.

Climate regulation: Climate change is predicted to affect the amount and distribution of rainfall; this has an impact on flows and water levels, drought and flood events. Work carried out in 2002 showed that by 2050 river flows in winter may rise by 10-15% but in the summer and early autumn could reduce by over 50% and as much as 80% in some places. As a consequence, droughts and flood events may become more common. Climate change may affect groundwater recharge. By 2025 it is likely that groundwater recharge will decrease, resulting in decreased dry weather river flows and a general lowering of groundwater levels. This may have impacts on base-flow to rivers and wetlands in dry periods and affect small domestic and agricultural water supplies. Further evidence has identified risks to aquifers and habitats from salt water intrusion²⁹.

Regulating water quality: The 2015 Severn River Basin Management Plan³⁰ identifies a range of factors that are detrimental to water quality and biodiversity which in the case of the River Wye catchment particularly relates to phosphate loads and poor soil management (leading to excessive overland flow/sediment loss to water) which results from the largely rural nature of the watershed where agriculture dominates with arable, dairy and sheep farms on generally sandy silty soils prone to erosion, particularly within its upper reaches. A variety of management initiatives have been identified to maintain and improve water quality, including:

- The use of buffer strips to control and regulate the deposition of silt into watercourses and control erosion;
- Improvements to water treatment and restrictions on groundwater abstraction;

²⁹ The State of Natural Resources Report (SoNaRR): Assessment of the Sustainable Management of Natural Resources. Technical Report. Natural Resources Wales.

³⁰ Environment Agency (December 2015). Part 1: Severn River Basin District River Basin Management Plan. On behalf of Defra, Welsh Government, Natural Resources Wales and Environment Agency.

- Increases in winter storage reservoirs;
- Use of SuDS and river buffer zones to reduce flooding, soil and nutrient loss;
- Provision of habitat such as buffer strips, fish passes, improvements to riverbank condition;
- Improvements in water quality to support recreation and tourism;
- Reduction in the use of fertilizers to no more than is needed, to protect groundwater aquifers.

Regulating water (flooding): The Wye catchment has a wide variation of fluvial flooding issues ranging from extended periods of elevated levels within the River Wye Valley that affect many communities, flooding from tributaries of the River Wye, flooding from quickly responding catchments and tidal flooding from the Severn Estuary (see **Diagram D2.2**). In addition climate change is likely to increase the pressure on existing locations where surface water/sewer flooding occurs. The greatest threat to the lower catchment is from sea level rise which could increase flood risk significantly in Chepstow and surrounding low-lying areas. Environmental Objectives for the management of flood risk include:

- Restoration of sustainable natural storage of floodwater in the upstream area, in order to offset increasing flood risk from trends including climate change;
- Improving the water environment through flood risk management activities;
- Improving the hydro-morphology of rivers;
- Minimising impacts of flooding on designated sites or areas of environmental interest; and,
- Habitat creation through flood risk management activities.

Regulating soil erosion and quality: The soils of best quality and most productive agricultural land are a scarce and finite resource in Wales; accounting for less than 7% of land area. Soil quality has deteriorated across all habitats apart from woodlands where there has been some improvement. The severity and spatial extent of soil erosion has not been directly quantified in Wales. Around 10-15% of grassland fields in (England and) Wales are thought to be affected by severe soil compaction and 50-60% are in moderate condition. No data exists on compaction in grassland and arable land across Wales specifically. Topsoil carbon concentrations are generally stable and there is ongoing recovery from soil acidification. Although a significant decline in soil phosphorus levels has been seen for Improved Land, it remains above the optimum levels in many (44%) agricultural fields. Soil invertebrate (mesofauna) numbers indicate no overall trend. There has been little or no decline in elevated levels of soil contaminants from industry and transport. The UK Climate Change Risk Assessment 2017 Evidence Report³¹ has identified risks to soils from increased seasonal aridity and wetness. Climate change related risks are threatening the many services that soils provide, notably those that relate to soil biota, soil organic matter, and soil erosion and compaction¹⁰.

Regulating coastal processes: The role the River Wye plays in regulating coastal process is addressed in relation to The Gwent Levels.

³¹ Committee on Climate Change. 2016. UK Climate Change Risk Assessment 2017 Evidence Report, Summary for Wales [online]. Available from: <https://documents.theccc.org.uk/wp-content/uploads/2016/07/UK-CCRA-2017-Wales-National-Summary.pdf>.

Cultural Services

Cultural services provide direct, non-material, benefits to human society, addressing a range of social and cultural needs that encompass a sense of place and inspiration, a sense of history, tranquillity and recreation.

Sense of place and inspiration: The Wye catchment, as it winds its way between the foothills of the Brecon Beacons and the Wye Valley AONB, passes through wooded rolling countryside comprising predominantly pastoral farmland and small village settlements. Overall, this part of Monmouthshire is fairly tranquil, with large areas categorised in the 2009 tranquil areas assessment as 'undisturbed' (countryside usually free of any substantial disturbance in daytime). The only large settlement within this zone is the town of Monmouth, with its rich historical and cultural associations.

Sense of history: This large area has a varied distribution of archaeological sites and monuments dating back to the prehistoric period. Strategically located Iron Age hillforts on summit tops overlook the Wye valley and accentuate the topography. The richness of the agricultural land led to successive 'colonisations' by a sequence of Roman, Early Christian, Norman and Marcher Lordship societies. The area is rich in mediaeval castles and fortified manors and Medieval churches with distinctive stone crosses.³²

Leisure and recreation: The Wye catchment within Monmouthshire offers opportunities for walking and cycling. The River Wye and its tributaries are noted for their fishing. This area of the County also offers many historical sites and towns to visit. The annual Monmouth Festival provides a focus for the arts and culture.

³² NRW (2015) Central Monmouthshire NLCA (NLCA 31)

Zone E: Brecon Beacons Uplands

Supporting Services

Supporting services are those which are essential to the functioning of ecosystems and indirectly responsible for all other services. This includes the relationship between underlying geology and soil character, soil formation and the processes of plant growth, including pollination.

Geology and soil character: The parts of the Brecon Beacons that fall within the county are predominantly Devonian Old Red Sandstone (see **Diagram D2.1**). Generally, Monmouthshire's localised areas of poor to very poor quality soils occur mostly within the Brecon Beacons over the higher ground.

Soil formation: Agriculture relies on soil formation, nutrients, water flow and pollination. The uplands play a significant role in water storage, quality and release, providing a natural defence against both drought and flood. As long as they are free from the effects of heavy grazing, upland peat bogs store carbon and combat atmospheric pollution and illegal fires. They capture atmospheric carbon which helps mitigate the effects of climate change³³.

Pollination: by insects also provides a supporting service for primary production to support both agricultural production and nature conservation. However, the serious consequences of significant declines in insect pollinator populations, considered largely to result from the loss of flower-rich habitat, habitat fragmentation and the use of certain pesticides, has been recognised in the government's National Pollinator Strategy³⁴ and the creation of initiatives such as B-Lines³⁵ to promote landscape-scale habitat creation to try and reverse the decline in pollinating insects.

³³ A Management Plan for the Brecon Beacons National Park 2015-2020.

³⁴ Defra (November 2014). The National Pollinator Strategy: for bees and other pollinators in England.

³⁵ <https://www.buglife.org.uk/campaigns-and-our-work/habitat-projects/b-lines>

With respect to Monmouthshire as a whole, the green infrastructure action plan for pollinators in SE Wales³⁶ identifies those areas where pollinators directly contribute to supporting human life and food, notably where there is the high demand in urban areas for pollinators for fruit and vegetables in gardens and allotments. The action plan also points out that there is only a relatively small percentage of arable land that comprises crops such as oilseed rape which need pollinators, and this is concentrated in the lowland arable areas of Monmouthshire. Other areas such as, for example, nature reserves, have indirect requirements for pollinators.

The Action Plan provides a framework for identifying appropriate areas and types of land where interventions to support pollinators could be delivered, and provides a variety of recommendations and desired outcomes for measuring success. In terms of broad measures of success, the Action Plan reports a success rate of approximately 90% for the use of yellow rattle as a means of reducing the vigour of grass growth (thereby allowing a more floristically rich sward to develop) and it also identifies the inter-relationship between the County's 'cut and collect' grass mowing regime for maintaining grasslands (e.g. roadside verges), which is a key management tool in maintaining floral diversity, and the generation of biomass for energy production.

³⁶ TACP (2015). Green infrastructure action plan for pollinators in South-east Wales. Report to Monmouthshire County Council on behalf of Monmouthshire County Council and Blaenau Gwent, Caerphilly and Torfaen County Borough Councils December 2015. TACP UK Ltd.

Provisioning Services

Provisioning services relate to the supply of goods such as freshwater, food and fuel.

Water availability: The uplands play a significant role in water storage, quality and release by virtue of their peat-forming and water storing wetlands, providing a natural defence against both drought and flood. There are 23 drinking water sources in the National Park including reservoirs, rivers, springs and boreholes. 36% of Cardiff's drinking water is sourced directly from the Brecon Beacons National Park area, and if water from the River Usk (which has over half of its watershed within the National Park) is included, the figure is over 90%³⁷. The River Usk SAC and its floodplain is considered to be at its abstraction limit.

Food provision: Much of the central and southern parts of Monmouthshire are utilised for sheep grazing and dairy farming, with some smaller areas of arable farming on the fertile floodplain where good drainage allows. A small number of traditional orchards are present. In the northwest of the county, higher land, much of which are commons, tends to be sheep grazed, with small scale enclosed sheep and dairy pasture on the lower slopes and valleys. Some localised areas of farmland have been turned over to other uses, including diversification of business activities such as solar or wind power generation (eg. the solar farm development at Llancayo in the Usk Valley). These diversifying factors can influence productivity and, importantly, how separate land parcels are managed in a landscape that requires a coherent approach to, for example, land drainage.

Fuel & fibre: The Brecon Beacons offers a variety of landscapes capable of providing sources of clean, sustainable energy. The National Park Authority provides guidance on the provision of: standalone wind turbine power generation; heat pumps; woodfuel and biomass heating systems and micro and small-scale hydro power systems. With respect to the volume of biomass that could realistically be harvested, however, there may be restrictions on the size of any associated power plant. As an alternative the biomass could form

37 BBNP (July 2009). Brecon Beacons National Park: a good place for Glastir Sustainable Land Management Scheme

one stream of supply to an existing plant, but the value of this would need to be considered in relation to the embedded energy costs associated with transportation.

The Renewable Energy Community Scheme³⁸ (RECS) has recently completed a feasibility study to consider the inter-relationship between small-scale 'green' energy generation and natural floodplain management to control surface water flooding. The feasibility study has been undertaken around Monmouth, but its key findings are intended to be applicable county-wide. The aims of the project were to:

- Identify acreage suitable for woodland planting which, with sustainable management provide fuel for community heating schemes, the contribution these plantings would make to the reduction of surface water run-off, any land management that would assist in additional reduction of surface water run-off;
- Advise on the contribution to the reduction of surface water run-off from community orchards; and,
- Identify suitable watercourses for the installation of micro hydro schemes with the direct benefit of providing power for local community use.

The Feasibility Study has also created a RECS 'Effectiveness Calculator', which estimates the reduction in run-off and flashiness of a run-off event that could result from a particular action or intervention, based on a suite of site specific data.

38 <http://monmouthshire.biz/project/renewable-energy-community-schemes-recs/>

Regulating Services

Regulating services maintain natural systems that include water quality, flooding, soil erosion and coastal processes.

Climate regulation: Eroding peat bog is a particular feature of the National Park with the largest concentration of this degraded habitat in Wales. Reversing this is an important contribution to mitigating the effects of climate change through land management. The range of likely climatic responses from west to east requiring differing responses in one unified area highlights the strategic role that the Brecon Beacons National Park can play, as a barometer of change. The range of likely changes includes:

- Average summer temperatures in the Brecon Beacons National Park: - in the west of the Park increases are very likely to be between 1-2oC and 5-6oC warmer; in the east of the Park increases are very likely to be between 2-3oC and 6-7oC warmer.
- Average summer precipitation in the Brecon Beacons National Park: - summer precipitation is very likely to decline by 40-50% and very unlikely to increase by 0-10%, i.e., the Brecon Beacons National Park may experience between 10% more and 50% less rainfall in the summer months.
- Average winter precipitation in the Brecon Beacons National Park: - increases in winter precipitation are very likely to be up to 60-70% in the west and 40-60% in the east.

Without intervention through catchment management, these precipitation changes represent a significant risk to water supplies to south Wales; less rainfall in the summer and more in the winter amounts to a net loss overall because the excess water falling during the winter months will exceed storage capacity and will therefore run off the land into the rivers, exacerbating flood risks.

Regulating water quality: Within the National Park there are large areas of severely degraded blanket bog and wet heath, the degree of erosion and oxidation of which is adversely affecting water quality and natural water storage, in a part of Wales where water quality and supply are critical to a large section of the population³⁹. Additionally, The declining numbers of livestock on the upland commons within the Brecon Beacons National Park increase the risk of uncontrolled fires on large areas of dry Molinia-dominated moorland, which would further undermine the water quality and water conservation of this strategically important area. Conversely, there are also signs that the peat-forming and water-holding Sphagnum mosses are recovering in places where grazing pressure and trampling is reduced, which is also due to improvements in air quality.

The water quality within the River Usk SAC and its floodplain is heavily influenced by the surrounding land use and by the poor ecological condition of its upland catchments, which feed the main river and its SAC tributaries. For example, it has been demonstrated that the levels of sedimentation within the River Usk are directly affected by the extent of eroding river banks for 500m upstream and the lack of floodplain woodland. It has also been demonstrated that as the extent of woodland and rough grazing declined, the ecological richness of the river declined too.

Regulating water (flooding): The upper part of the Usk catchment into the Brecon Beacons demonstrates a flow regime with rapid rainfall runoff, caused by the steep sided narrow valleys and thin soils underlain by mainly impermeable rock; resulting in the lower reach flood plains becoming inundated during periods of heavy rainfall (see **Diagram D2.2**). The lower Usk tends to be less responsive to rainfall due to the larger catchment area and lowland relief.

Regulating soil erosion and quality: The Brecon Beacons National Park includes areas of deep peat and degraded bog which without buffering, is likely to lead to the degradation and loss of peat and soils with attendant impacts on water quality and downstream flooding risk.

³⁹ BBNP (July 2009). Brecon Beacons National Park: a good place for Glastir Sustainable Land Management Scheme

Cultural Services

Cultural services provide direct, non-material, benefits to human society, addressing a range of social and cultural needs that encompass a sense of place and inspiration, a sense of history, tranquillity and recreation.

Sense of place and inspiration: Monmouthshire presents a unique blend of Welsh and English cultures typical of this historically contested borderland at the entrance to Wales. In the Brecon Beacons, a special quality identified is “the Park’s sweeping grandeur and outstanding natural beauty observed across a variety of harmoniously connected landscapes, including marvellous gorges and waterfalls, classic karst geology with caves and sink holes, contrasting glacial landforms such as cliffs and broad valleys carved from old red sandstone and prominent hilltops with extensive views in all directions.”

Some of the key qualities identified by the Brecon Beacons Management plan are:

- A feeling of vitality and healthfulness that comes from enjoying the Park’s fresh air, clean water, rural setting, open land and locally produced foods.
- A sense of place and cultural identity - “Welshness” - characterised by the use of the indigenous Welsh language, religious and spiritual connections, unique customs and events, traditional foods and crafts, relatively unspoilt historic towns, villages and family farms. The continued practices of traditional skills developed by local inhabitants to live and earn a living here, such as common land practices and grazing.
- A sense of discovery where people are able to explore the Park’s hidden secrets and stories such as genealogical histories, prehistoric ritual sites, medieval rural settlements, early industrial sites, local myths, legends and geological treasures.

- The Park’s sweeping grandeur and outstanding natural beauty observed across a variety of harmoniously connected landscapes, including marvellous gorges and waterfalls, classic karst geology with caves and sink holes, contrasting glacial landforms such as cliffs and broad valleys carved from old red sandstone and prominent hilltops with extensive views in all directions.
- A working, living “patchwork” of contrasting patterns, colours, and textures comprising of well-maintained farmed landscapes, open uplands, lakes and meandering rivers punctuated by small-scale woodlands, country lanes, hedgerows, stone walls and scattered settlements.
- Extensive and widespread access to the Park’s diversity of wildlife and richness of semi-natural habitats, such as native woodlands, heathland and grassland, natural lakes and riparian habitats, ancient hedgerows, limestone pavement and blanket bogs including those of international and national importance.
- In the context of the UK, geographically rugged, remote and challenging landscapes.
- Enjoyable and accessible countryside with extensive, widespread and varied opportunities to pursue walking, cycling, fishing, water-based activities and other forms of sustainable recreation or relaxation.
- An intimate sense of community where small, pastoral towns and villages are comparatively safe, friendly, welcoming and retain a spirit of cooperation.

Sense of history: The Brecon Beacons exhibit the results of glacial activity as the ice sheet retreated. The hills and particularly the northern scarp was incised by glaciers, there are also some well-preserved glacial scree and moraines. Humans have been active in this landscape since the end of the last ice age and traces of human habitation in the form of prehistoric stone circles and burial chambers, Iron Age hillforts and Roman camps.

The Brecon Beacons are also home to a large number of castles built by the Normans, and other examples of built heritage include priories and medieval farmhouses. Land use encompassed the provision of firewood, turf, peat and gravel, and as grazing for sheep, cattle and pigs. The landscape is also crossed by many trackways which were used over the centuries by drovers to take their livestock to market.

The Industrial Revolution saw significant change with limestone, silica sand and ironstone were quarried on the fringes of the Park to feed demand from the furnaces of the South Wales Valleys. Associated infrastructure included the construction and operation of the Monmouthshire canal which connected with a network of tramroads and railways and became important transport corridors for the movement of goods and materials. As well as industrial structures, the Georgian and Victorian age brought some fine urban and rural buildings to the area, some of which still retain their original features.

The Brecon Beacons also has a long history of links with the military from its use as a cavalry base by the Romans to modern day training⁴⁰.

Leisure and recreation: Tourism and leisure form key mainstays of the local economy. People regularly come here for the special landscape, for outdoor activities and for the superb food and drink available locally. Walking is by far the most popular of the more active pursuits, but cycling, mountain biking, horse riding and fishing are all enjoyed on a wide scale. More specialist activities you can take part in are caving, canoeing, sailing, hang-gliding and parascending⁴¹.

The Brecon Beacons has also been declared an International Dark Sky Reserve due to its sky views at night and little light pollution, this is a highly acclaimed stargazing location.

⁴⁰ <http://www.breconbeacons.org/history>

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GI Needs and Opportunities Assessment

Zone A: Gwent Levels

This section explores opportunities for improving GI within Zone A: Gwent Levels. The opportunities have been identified through analysis of existing studies, the ecosystem services described in **Appendix D2**, and stakeholder consultation workshops - see **Appendix C**.

GI Needs & Opportunities for Improving Health & Wellbeing

There is a need to improve access and recreation facilities for local communities and visitors to the Gwent Levels. There is growing evidence that access to, and enjoyment of natural and semi-natural greenspaces enhances people's health and well-being, particularly in areas of social deprivation. Engagement with the natural and cultural heritage of the Gwent Levels is key to the conservation of this remarkable landscape for future generations.

The GI opportunities outlined in this section were informed by the Gwent Levels GI Strategy, which should be referenced for further details.

Opportunities for GI to help in addressing health and well-being needs within the Gwent Levels GI Zone could include:

- Focusing investment on improving/enhancing distinctive places, gateways and access routes within the study area that have a role to play in helping people to engage with, appreciate and enjoy the key landscape themes and attributes that make the Gwent Levels special.
- Maximising opportunities presented by a level landscape for cycling and encouraging healthier lifestyles by providing traffic free cycle routes that cater for all abilities and provide a low impact form of access to ecologically sensitive sites for local people and visitors.
- Reviewing 'gaps' in the route of the Wales Coast Path (as part of the review of the Appropriate Assessment under the Habitat Regulations) to consider again the re-alignment of the path where it diverges from the sea wall such as: south of Chepstow and south of Caldicot.

- Enhancing connectivity between the Levels and local communities/greenspaces in the Monmouthshire Severnside Settlements.
- Considering opportunities to enhance intellectual access to and understanding of the Gwent Levels' unique landscape, history and wildlife, such as through the promotion of 'citizens science' projects via outreach programmes for researching, identifying and recording the ecological and historical interest of the Gwent Levels.

GI Needs & Opportunities for Enhancing Biodiversity & Increasing Ecosystem Resilience

A sustainable approach is critical for supporting the protection of biodiversity and ecosystem resilience. The biodiversity value of the extensive network of field drainage ditches and reens is vulnerable to neglect through lack of appropriate maintenance, changes in drainage and land use. This is essential to increase the range and extent of habitats and species and their resilience.

Opportunities for GI to help in addressing biodiversity and ecosystem resilience needs within the Gwent Levels GI Zone could include:

- Restoring over-drained or damaged wet grasslands, and reinstating traditional water management techniques and groundwater levels, where appropriate.
- Working through co-ordinated and collaborative management with existing projects, and specifically across the suite of nature reserves, as well as through emerging initiatives, to deliver enhanced land and water management and habitat connectivity, as well as informed and continuing engagement with local communities and user groups.
- Encouraging the diversification of habitats to include the creation, restoration and connectivity of flower-rich habitats to support and sustain pollinating insects.
- Identifying inter-tidal habitat creation opportunities in partnership with NRW on land under their ownership, particularly where it occurs near the seawall.

- Enhancing the biodiversity value of saltmarsh beyond the sea wall by managing overgrazing (and fly grazing) and under-grazing of this important inter-tidal habitat to reduce negative effects on the botanical and ecological interest.
- Diversifying the grassland sward on the seawall banks, without compromising its integrity or the ability to inspect the condition/integrity of the sea defences, should be considered. Increasing floristic diversity and implementing a sympathetic mowing regime has the potential for the creation of a grassland habitat corridor for the support of pollinators.
- Raising awareness of the importance of the roosting and feeding areas for birds around the coast and estuaries and the relationship to the inland wetlands of the Gwent Levels, ensuring that they are adequately protected, managed and enhanced.
- Identifying opportunities along the larger watercourses where river banks could potentially be set back to increase riparian habitats.

GI Needs & Opportunities for Strengthening Landscape Character & Distinctiveness

The extensive network of field drainage ditches and reens are one of the most distinctive landscape features of the Gwent Levels, which is a unique hand-crafted cultural landscape. There is a need to maintain and restore these, along with other historic landscape features, where appropriate.

Opportunities for addressing these needs within the Gwent Levels GI Zone could include:

- Encouraging the reinstatement of historic drainage features to maintain the drainage system as a distinctive landscape feature of the Gwent Levels by giving consideration to reinstating lost field ditches and grips; and managing riparian vegetation to reduce the dominance of double-hedged ditches and reens in order to restore their traditional open character.
- Maintaining water levels to protect as yet undiscovered buried archaeology associated with the Gwent Levels' unique landscape history.
- Discouraging field enlargement and/or the infilling of field ditches that would result in the loss of watercourses, leading to the erosion of the strong geometric pattern in the landscape, and the abandonment of traditional channel management practices.
- Promoting the restoration and/or continued management of pollard willows along drains, ditches, reens, roadsides and tracks, to reinforce traditional landscape character and enhance habitat connectivity, and providing small-scale, localised sources of wood fuel.

GI Needs & Opportunities for Increasing Climate Change Resilience

In the context of the challenges presented by climate change and rising sea levels, there is a need to continue working with and adapting to the natural estuarine processes related to the Severn Estuary and the associated river estuaries. There is also a fundamental need to manage water and the network of watercourses within the Gwent Levels. This is essential for maximising GI benefits such as improved flood management, water and soil quality.

Opportunities for addressing these needs within the Gwent Levels GI Zone could include:

- Developing a landscape-scale approach to wetland management in general and in particular, maintaining and restoring a functioning ditch and reen system. Multiple benefits that may accrue through a landscape-scale approach include: managing aquatic and marginal vegetation to maintain the function and conservation interest of ditches and reens in appropriate locations compatible with flood risk management objectives; the maintenance of a healthy, productive, farmland landscape; and the control and management of flood risk.

- Maintaining and restoring water management infrastructure – pumps, sluices and other control mechanisms, ditches, reens, drains and grips, as well as the sea wall – to minimise the impact of flooding on people and property.
- Researching and exploring innovative approaches and options to address water management that potentially benefit both the natural environment and agriculture. Also, exploring mechanisms that release land to make space for more water storage and gravity drainage, including land purchase, land swaps, payment for ecosystem services schemes and farmer early retirement schemes.
- Encouraging participation in the delivery of objectives identified in relevant River Basin Management Plans. These include: initiatives to manage diffuse pollution arising from urban areas, new development, agriculture and rural land management; control of invasive non-native species; management of potential conflicts between different user groups; management of adequate water levels and active river processes; mechanisms for reducing pressure from abstraction and the restoration of aquatic habitats and species, as identified for the River Usk.
- Applying policy and good practice guidance to ensure the incorporation of sustainable drainage schemes (SuDS) into all new development, in order to minimise uncontrolled surface water flows onto the Gwent Levels.
- Undertaking studies to determine the extent to which upland watersheds influence both the quantity and quality of water on the Gwent Levels. In particular, the influence of changes in agricultural practices, commercial forestry and long-term landscape change resulting from significant tree loss through disease, may all influence the future water resources of the Levels.
- Aiming to develop a more diverse range of habitats, vegetation types and structures within holdings, enabling habitats and species to respond to the effects of climate change, while maintaining viable farming businesses, cultural associations and traditions and the overall character of the area.

- Ensuring that the Seven Estuary Shoreline Management Plan continues to recognise the outstanding historic landscape significance and high nature conservation value of the Gwent Levels, and the fundamental role that the sea defences plays in sustaining these interests. Working in partnership with all those with a stake in the long-term sustainability of the area is critical to develop consensus around approaches to addressing the challenges of climate change, and its environmental and economic consequences.
- Incorporating coastal heritage sites into climate change adaptation plans, wherever possible, recording, promoting, understanding and recognising their historical significance and their contribution to local culture and coastal landscape character.

GI Needs & Opportunities for Supporting Sustainable Economic Development

There is a need to manage the landscape of the Gwent Levels sustainably. This includes a sustainable approach to farming, which is critical for supporting the protection of soils and water, biodiversity and locally distinctive landscapes in particular.

Opportunities for addressing these needs within the Gwent Levels GI Zone could include:

- Supporting the local farming community, where possible through agri-environment grants (Glastir or its post-Brexit successor scheme), encouraging flexibility in land management, where appropriate maintaining the existing mixed farming systems, conserving soils and increasing the floristic diversity of wet meadows.
- Advising landowners on the re-creation, where feasible, of habitats such as wet grassland, reedbeds and fens, in the context of maintaining commercially viable agricultural activity within the area. Where specific landholdings may no longer be commercially viable, consider opportunities for the diversification of land-use to encompass the creation or restoration of semi-natural habitats.

- Encouraging more extensive and sustainable land management (by means of appropriate stocking densities and the use of hardy traditional cattle breeds), reducing the risk of soil compaction and poaching, increasing opportunities for floristic diversity, promoting the sensitive uses of pesticide and fertiliser, and implementing manure management plans, reducing nutrient enrichment of watercourses and improving overall water quality.
- Promoting best practice in soil management, use of low-pressure machinery, and careful management of livestock near watercourses and bank sides, using grassland buffer strips and semi-natural habitats to enhance infiltration and protect watercourses from nutrient and sediment input.
- Identifying opportunities for farm business diversification through mechanisms such as premium brand marketing, use of traditional premium value hardy breeds, payment for ecosystem services, and linking the management of the Gwent Levels to upstream watersheds where relevant.
- Working in collaboration with landowners to realise the potential for landscape-scale restoration schemes in suitable areas where recutting of former ditches, removal of hedgerows and reseeded of grassland could be considered.
- There is an opportunity to support the Monmouthshire Destination Development Plan, where access to the countryside is a key part of Monmouthshire's offer.



Zone B: Wye Valley

This section explores opportunities for improving GI within Zone B: Wye Valley. The opportunities have been identified through analysis of existing studies, the ecosystem services described in **Appendix D2**, and stakeholder consultation workshops - see **Appendix C**. This section should be read in conjunction with the Wye Valley AONB Management Plan 2015-2020.

GI Needs & Opportunities for Improving Health & Wellbeing

There is a need to maintain, and where appropriate, improve access and recreation facilities for local communities and visitors to the Wye Valley. There is growing evidence that access to, and enjoyment of natural and semi-natural greenspaces enhances people's health and well-being, particularly in areas of social deprivation. There is a need for people to continue to enjoy active recreation in the Wye Valley that does not detract from the natural beauty of the area. Engagement with the natural and cultural heritage of the Wye Valley is key to the conservation of this remarkable landscape for future generations.

Opportunities for GI to help in addressing biodiversity and ecosystem resilience needs within the Wye Valley GI Zone could include:

- Promoting the understanding and enjoyment of the cultural heritage and historic environment
- Increasing understanding, awareness and enjoyment of trees and the special nature of the Wye Valley woodlands and promote them as a resource for appropriate educational, community, recreational and health opportunities
- Encouraging community led initiatives that maintain the diversity, sustainability and quality of rural community life and/or that stimulate investment, local employment and retain or improve facilities and services for local people,
- Encouraging and promoting recreational pursuits and responsible access compatible with the AONB purposes, particularly linking sustainable transport and town and village facilities.

- Supporting appropriate levels of sustainable design, repair, signage and maintenance on public rights of way, recreational trails and sites, using materials in keeping, in order to conserve or enhance the character and natural beauty of the Wye Valley.
- Assisting in identifying gaps in access and recreational provision, including for under-represented and minority groups, and work with appropriate bodies and stakeholders to support and promote access enhancements and improved access for all, where this does not conflict with the Special Qualities of the AONB and the SACs

GI Needs & Opportunities for Enhancing Biodiversity & Increasing Ecosystem Resilience

A sustainable approach is critical for supporting the protection of biodiversity and ecosystem resilience. The Wye Valley GI Zone is particularly rich in wildlife and has a high concentration of designated sites. The quality of the river and riverine habitat, with migratory fish and otters, are of European importance. Similarly the near continuous woodlands interspersed with species rich grassland make a high quality connected landscape. Managing this range of habitats appropriately is essential to maintain and increase the range and extent of habitats and species and their resilience. There is a need to conserve, and where appropriate enhance and restore, the biodiversity of the Wye Valley GI Zone in robust ecological networks.

Opportunities for GI to help in addressing biodiversity and ecosystem resilience needs within the Wye Valley GI Zone could include:

- Contributing to the delivery of national, regional and local Biodiversity targets and priorities for key habitats and species relevant to the Wye Valley, in partnership with relevant organisations.
- Encouraging and supporting measures that contribute to the management of all statutory designated sites and County local/key wildlife sites so that they are in favourable condition and within robust ecological networks.

- Promoting the adoption of schemes and initiatives that sustain, enhance and/or restore the characteristic biodiversity of the Wye Valley, and that enable ecological systems and natural processes to accommodate and adapt to climate and other environmental change, including through landscape scale habitat connectivity.
- Identifying species and diseases considered to be detrimental to the biodiversity value of the Wye Valley and encourage their monitoring, management and, where appropriate, their control.
- Supporting the identification and monitoring of key indicator species and priority species and habitats, in partnership with conservation organisations, relevant individuals and the Local Biological Record Centres.
- Promoting awareness, sources of advice and involvement in biodiversity conservation by landowners, land managers, businesses, local communities, schools and the public including of impacts from outside the Wye Valley.
- Providing best practice advice to woodland owners and managers on sustainable multipurpose management of the Wye Valley woodlands, including sensitive PAWS restoration, encouraging 'the right tree in the right place' and the ecosystems approach.
- Supporting the monitoring, management and where appropriate, control of diseases, pests and other threats, which may cause substantial mortality in tree species and woodland habitats and seek to mitigate the landscape impact of any loss.
- Encouraging the diversification of habitats to include the creation, restoration and connectivity of flower-rich habitats to support and sustain pollinating insects as part of the B-Lines initiative.

GI Needs & Opportunities for Strengthening Landscape Character & Distinctiveness

There is a need to conserve and enhance the natural beauty of the landscape in the Wye Valley with its natural and cultural features and processes, and the special qualities and features of the landscape (including the pattern of woodlands, many of which are ancient; the strong network of thick hedges, hedge banks, drystone walls and tree lines; and the distinct sense of place from the relationship of the woodland, pasture and settlement). There is also a need to ensure woodlands and trees throughout the Wye Valley are managed sustainably in a way that protects and enhances the outstanding ancient woodland character of the area, and provides environmental, social and economic benefits.

Opportunities for GI to help in addressing landscape character and distinctiveness needs within the Wye Valley GI Zone could include:

- Promoting and develop policies and initiatives to conserve, enhance, restore or create the features and elements that maintain the Special Qualities, landscape character and natural beauty of the AONB. Ensure their sustainable management and mitigate, reduce or remove detrimental features.
- Supporting measures which increase public awareness and appreciation of the natural beauty and importance of the Wye Valley.
- Seeking to mitigate and/or reduce, or as a last resort remove, agricultural activity which significantly diminishes or destroys the Special Qualities, natural beauty and landscape character of the AONB.
- Developing and supporting tree, woodland and forestry initiatives and policy that conserve, restore and/or enhance the Special Qualities, biodiversity and natural beauty of the area, ensuring no net loss of semi-natural woodland cover unless there are overriding nature or heritage conservation benefits.

- Encouraging and supporting high standards of design, materials, energy efficiency, drainage and landscaping in all developments, including Permitted Development, to ensure greater sustainability and that they complement and enhance the local landscape character and distinctiveness including scale and setting and minimise the impact on the natural environment.

GI Needs & Opportunities for Increasing Climate Change Resilience

In the context of the challenges presented by climate change, which threaten to degrade distinctive landscape features and wildlife habitats; there is a need to adapt and arrest destructive change in places. Species diversification is very much at the core of woodland adaptation and ensuring resilience in the future. There is also a fundamental need to manage water appropriately. This is essential for maximising GI benefits such as improved flood management, water and soil quality.

Opportunities for GI to help in addressing climate change resilience needs within the Wye Valley GI Zone could include:

- Supporting and promoting the development of renewable forms of energy generation that do not impact negatively on the landscape features and Special Qualities of the AONB
- Promoting ecological connectivity and robust habitats in order to sustain diversity.
- Restoring habitats e.g. woodlands/vegetation, to help reduce flooding and offset air pollution whilst also conserving the key features and characteristics which have led to the AONB designation that make it so attractive to locals and visitors today.
- Providing sustainable urban drainage to absorb excess rainfall and ensuring the character of the river is not degraded.

- Contributing space to grow foods using sustainable methods thus promoting healthy diets for local communities but also enhancing biodiversity, providing jobs and educational benefits.
- Safeguarding accessible green space which helps reduce the effects of urban heat islands and also contributes to people's sense of health and well-being as well as having economic benefits relating to tourism.
- Reducing carbon emissions through encouraging alternative modes of transport by walking and cycling whilst also supporting health, well-being and tourism.
- Developing and co-ordinating the acquisition and analysis of data across the AONB, to inform priority setting, planning, implementation and monitoring of change affecting the natural beauty, including developing a better understanding of the likely impacts of climate change on the landscape of the Wye Valley AONB and supporting mitigation and adaptation actions.

GI Needs & Opportunities for Supporting Sustainable Economic Development

There is a need to manage and develop the landscape of the Wye Valley sustainably. This includes a sustainable approach to development and management of environmental impacts in more built-up areas; and to farming, which is critical for supporting the protection of soils and water, biodiversity and locally distinctive landscapes in particular. Amongst the purposes of the AONB is that 'particular regard should be paid to promoting sustainable forms of social and economic development that in themselves conserve and enhance the environment'. There is a need for this to include fostering viable farming enterprises that manage the land in ways that conserve and enhance the natural resources and local distinctiveness of the AONB.

Opportunities for GI to help in addressing sustainable economic development needs within the Wye Valley GI Zone could include:

- Encouraging farmers and landowners to develop and adopt sustainable management practices that conserve or enhance the features, Special Qualities and natural beauty of the Wye Valley AONB.
- Encouraging the maximum uptake of, agri-environment and other appropriate schemes, including support for small-holders, where they progress the conservation or enhancement of the natural beauty, biodiversity, historic environment and Special Qualities of the AONB, particularly through Catchment Sensitive Farming and mixed farming systems.
- Supporting the development of and funding for new skills, farming practices and farm-based activities that are compatible with the aims of AONB designation, and encourage and support traditional skills such as hay making, hedge laying, dry stone walling, woodland and coppice management, riparian tree works etc. that contribute to the maintenance of the Special Qualities of the AONB.
- Promoting a wider understanding of the value of farming to the landscape and economy.
- Supporting all appropriate measures to control diseases of agricultural crops, trees and livestock, which threaten the commercial viability of farming systems that conserve the landscape character, ensuring that the measures remain compatible with the conservation and enjoyment of natural beauty.
- Encouraging and support local producers to supply local food and promote and encourage the use of local produce by public bodies, consumers, accommodation providers and local food outlets.
- Supporting the development of employment and skills and markets for local timber and woodland produce.



Zone C: Usk Catchment

This section explores opportunities for improving GI within Zone C: Usk Catchment. The opportunities have been identified through analysis of existing studies, the ecosystem services described in **Appendix D2**, and stakeholder consultation workshops - see **Appendix C**.

GI Needs & Opportunities for Improving Health & Wellbeing

There is potential to expand access and recreation facilities for local communities and visitors to the Usk Catchment Zone. There is growing evidence that access to, and enjoyment of natural and semi-natural greenspaces enhances people's health and well-being, particularly in areas of social deprivation.

Opportunities for GI to help in addressing health and well-being needs within the Usk Catchment GI Zone could include:

- Providing interpretation for existing pedestrian/cycle paths, rights of way and walking routes connecting settlement such as Usk and the Usk Valley via existing PRoW (for example, the Usk Valley Walk) and cycle routes.
- Strengthening cycle route links along river valleys, links into national and regional cycle networks.
- Linking to healthy walking schemes and groups, as well as 'Health Walks', which can be prescribed by GPs.
- Expanding provision of pedestrian paths, rights of way and cycling routes to connect development via existing woodlands, open and green spaces to the wider countryside and key destinations including the Monmouth/Brecon canal and the River Usk.
- Enhancing existing green spaces and integration of green infrastructure into refurbishment or development of community assets such as local primary schools and publically owned or managed sites.

- Expanding allotment provision where appropriate around settlements.
- Improving access to currently inaccessible green spaces, such as areas of privately or estate run woodland, and less accessible common land.

GI Needs & Opportunities for Enhancing Biodiversity & Increasing Ecosystem Resilience

A sustainable approach is critical for supporting the protection of biodiversity and ecosystem resilience. The biodiversity value of the network of watercourses and woodlands is vulnerable to neglect through lack of appropriate maintenance, changes in drainage and land use. This is essential to increase the range and extent of habitats and species and their resilience.

Opportunities for GI to help in addressing biodiversity and ecosystem resilience needs within the Usk Catchment GI Zone could include:

- Eradicating and/or management of invasive non-native species in line with current national invasive species action plans, including Giant Hogweed.
- Reducing the impact of physical modifications to water courses, improving connectivity, habitat and morphology through soft engineering and restoration techniques. Improving habitats for fish, removing or modifying barriers to passage upstream.
- Reducing the impact of flood defence structures and operations - improve connectivity, habitat, and morphology by implementing options through measures such as soft engineering, opening culverts, upgrading tidal flaps, changing dredging and vegetation management.
- Restoring or enhancing existing assets and habitats to enhance existing green spaces, including restoration of semi-improved pasture and restoration of woodland.
- Encouraging the diversification of habitats to include the creation, restoration and connectivity of flower-rich habitats to support and sustain pollinating insects.

GI Needs & Opportunities for Strengthening Landscape Character & Distinctiveness

The extensive network of woodland (covering approximately 10% of the zone) is one of the most distinctive landscape features of the Wye Catchment. There is a need to maintain and enhance these green links, along with other historic landscape features, where appropriate.

Opportunities for GI to help in addressing landscape character and distinctiveness needs within the Usk Catchment GI Zone could include:

- Enhancing green links within development to strengthen existing settlement character, including key views into and out of settlements and reinforcing sense of place.
- Strengthening settlement edge treatments, reinforcing character, vernacular styles and boundary treatments.
- Researching, conserving and enhancing the historic environment and conserving archaeology.

GI Needs & Opportunities for Increasing Climate Change Resilience

In the context of the challenges presented by climate change, there is a fundamental need to manage water appropriately. This is essential for maximising GI benefits such as improved flood management, water and soil quality.

Opportunities for GI to help in addressing climate change resilience needs within the Usk Catchment GI Zone could include:

- Improving water levels and flows, reducing impacts of more regulated flows and abstractions, restoring more natural flow regimes and implementing options to improve water levels, such as water efficiency and recycling measures, alternative sources and supplies.

GI Needs & Opportunities for Supporting Sustainable Economic Development

There is a need to manage the landscape of the Usk Catchment sustainably. This includes a sustainable approach to development and management of environmental impacts in more urban areas; and to farming, which is critical for supporting the protection of soils and water, biodiversity and locally distinctive landscapes in particular.

Opportunities for GI to help in addressing sustainable economic development needs within the Usk Catchment GI Zone could include:

- Identifying and implementing changes to land drainage regimes and structures to restore water levels.
- Reducing pollution from waste water discharges at point sources. Investigate and implement basic pollution prevention measures, including provision of up to date advice and guidance, such as correct handling and storage of chemicals and waste, management of trade effluent, and regulation.
- Supporting implementation of sustainable agricultural practices, including the implementation of measures such as correct management of slurry, silage, fuel oil, and agricultural chemicals; clean and dirty water separation; nutrient management planning; buffer strips and riparian fencing; cover crops and soil management.
- Supporting sustainable woodland and forestry management, restoring the riparian zone, disconnecting forest drains and using forestry and woodland to reduce diffuse pollution.
- Investigating opportunities to solve misconnections to surface water drains (at residential and commercial properties) and implement sustainable drainage schemes (SuDS) to reduce diffuse pollution.

- Supporting water management; careful management of the various users—
Llandegfedd Reservoir: Recreation and Conservation Management Plan,
consultation with the Llandegfedd Reservoir User Liaison Group
- Supporting the local farming community, where possible through agri-
environment grants (Glastir or its post-Brexit successor scheme), encouraging
flexibility in land management, where appropriate maintaining the existing
mixed farming systems, and conserving soils.



Zone D Wye Catchment

This section explores opportunities for improving GI within Zone D: Wye Catchment. The opportunities have been identified through analysis of existing studies, the ecosystem services described in **Appendix D2**, and stakeholder consultation workshops - see **Appendix C**.

GI Needs & Opportunities for Improving Health & Wellbeing

There is potential to expand access and recreation facilities for local communities and visitors to the Wye Catchment Zone. There is growing evidence that access to, and enjoyment of natural and semi-natural greenspaces enhances people's health and well-being, particularly in areas of social deprivation.

Opportunities for GI to help in addressing health and well-being needs within the Wye Catchment GI Zone could include:

- Expanding provision of pedestrian paths, rights of way and creation or linking of circular walking routes (for example, the Three Castles Walk) to connect settlements via existing PROW and accessible green space. Connections between the core area where people live and work would also be beneficial. Opportunities also exist to improve access for horse riding with new bridleways/multi-use paths, and to create new cycle route links, connecting to local networks and to the Wye Valley beyond.
- Improving promotion and provision of interpretation for existing pedestrian/cycle paths, rights of way and walking routes.
- Linking to healthy walking schemes and groups, as well as 'Health Walks', which can be prescribed by GPs.
- Increasing allotment provision around smaller settlements.
- Facilitating new or enhanced green space provision; community spaces and play areas.

- Improving the condition of riverbanks, and the creation of fish passes will result in improved habitat for wildlife, and increase the sustainability of fish populations. Benefits to society will include an increase in angling opportunities and general enjoyment of spending time by the river.
- Enhancing existing green spaces and integration of green infrastructure into refurbishment/development of local community assets such as primary schools, and publically owned/managed sites
- Within settlements, linking green spaces between housing.
- Improving riverside access.
- Facilitating access to green spaces close to home rather than travelling to facilities further afield.
- Encouraging local people to become part of PROW maintenance groups, and to expand this beyond the current demographic.

GI Needs & Opportunities for Enhancing Biodiversity & Increasing Ecosystem Resilience

A sustainable approach is critical for supporting the protection of biodiversity and ecosystem resilience. The biodiversity value of the network of watercourses and woodlands is vulnerable to neglect through lack of appropriate maintenance, changes in drainage and land use. This is essential to increase the range and extent of habitats and species and their resilience.

Opportunities for GI to help in addressing biodiversity and ecosystem resilience needs within the Wye Catchment GI Zone could include:

- Improving modified habitats in watercourses, including the removal of barriers to fish migration; improvement to the condition of river channels/beds and/or banks/shoreline; improvement to condition of riparian zone and /or wetland habitats and through vegetation management. Buffer strips and improvements to the condition of riverbanks will help to protect soils, limiting the amount washed away when it rains.

- Managing invasive non-native species, building awareness and understanding (to slow the spread); and using mitigation, control and eradication to reduce extents.
- Restoring or enhancing existing assets and habitats providing additional/ expansion plantings and habitat to enhance existing green spaces, River Monnow, riverside habitats, managing existing habitats for protected species and maintaining/enabling sensitive public access.
- Improving forestry management, including, where appropriate, replacing with mixed native species and the opportunity to manage forest clearance areas.
- Encouraging the diversification of habitats to include the creation, restoration and connectivity of flower-rich habitats to support and sustain pollinating insects.

GI Needs & Opportunities for Strengthening Landscape Character & Distinctiveness

The extensive network of woodland (covering approximately 10% of the zone) is one of the most distinctive landscape features of the Wye Catchment. There is a need to maintain and enhance these green links, along with other historic landscape features, where appropriate.

Opportunities for GI to help in addressing landscape character and distinctiveness needs within the Wye Catchment GI Zone could include:

- Reinforcing landscape character by creating a multi-use, permeable green edge to settlements, that better integrates with surrounding vegetation pattern
- Improving and enhancing green links within new and proposed development to enhance existing settlement character, reinforce sense of place and improve links to the wider area
- Researching, conserving and enhancing the historic environment and conserving archaeology.

GI Needs & Opportunities for Increasing Climate Change Resilience

In the context of the challenges presented by climate change, there is a fundamental need to manage water appropriately. This is essential for maximising GI benefits such as improved flood management, water and soil quality.

Opportunities for GI to help in addressing climate change resilience needs within the Wye Catchment GI Zone could include:

- Improving natural flows and water levels, using alternative sources and relocating abstraction or discharge points. Improvements to water treatment and restrictions on groundwater abstraction should improve river flows and will increase the enjoyment of the water environment for local communities and improve habitats for wildlife. The farming community will also benefit from an increase in surface water availability.
- Increasing use of SUDS and river buffer zones, helping to hold water back in the catchment and therefore helping to reduce runoff and flood risk.
- Considering the need for more winter storage reservoirs, as rainfall may change in amount and distribution through the year.

GI Needs & Opportunities for Supporting Sustainable Economic Development

There is a need to manage the landscape of the Wye Catchment sustainably. This includes a sustainable approach to development and management of environmental impacts in more urban areas; and to farming, which is critical for supporting the protection of soils and water, biodiversity and locally distinctive landscapes in particular.

Opportunities for GI to help in addressing sustainable economic development needs within the Wye Catchment GI Zone could include:

- Managing pollution from towns and transport by reducing diffuse pollution at source (particularly in relation to Monmouth).
- Managing pollution in rural areas (including from agriculture), reducing diffuse pollution at source, reduce diffuse pollution pathways (i.e. controlling entry to the water environment); and mitigating or remediating diffuse pollution impacts.
- Managing pollution from waste water through mitigating or remediating point source impacts on watercourses.
- Developing a coherent approach to managing a landscape which is diversifying in land use – to include a range of agricultural uses, solar and wind energy generation.
- Developing biomass and wood fuel production.
- Supporting the local farming community, where possible through agri-environment grants (Glastir or its post-Brexit successor scheme), encouraging flexibility in land management, where appropriate maintaining the existing mixed farming systems, and conserving soils.



Zone E: Brecon Beacons Uplands

This section explores opportunities for improving GI within Zone E: Brecon Beacons Uplands. The opportunities have been identified through analysis of existing studies, the ecosystem services described in **Appendix D2**, and stakeholder consultation workshops - see **Appendix C**. This section should be read in conjunction with the Brecon Beacons National Park Plan 2015-2020 and Natural Resources Action Plan.

GI Needs & Opportunities for Improving Health & Wellbeing

There is growing evidence that access to, and enjoyment of natural and semi-natural greenspaces enhances people's health and well-being, particularly in areas of social deprivation. Opportunities for outdoor access and recreation are one of the key purposes of the Brecon Beacons National Park, so there is a need to provide these. The National Park contributes directly to the health and well-being of the nation, not only through its inspirational beauty, but also from the wide range of activities the unique landscape enables. There is a need to carefully manage activities for outdoor access and recreation to ensure that the Park's special qualities are preserved and enhanced.

Opportunities for GI to help in addressing health and well-being needs within the Brecon Beacons Uplands GI Zone could include:

- Implementing a variety of education, information and interpretation strategies, and to deliver an environmental education programme.
- Enhancing the visitor experience of wildlife, farming, landscape and environment.
- Increasing awareness of and provision for people with disabilities and easier access requirements through the implementation of the Rights of Way Improvement Plan.

- Providing access information in a variety of formats, including communicating information on safety and ecosystems. Develop a coordinated approach for providing information and interpretation to visitors and residents.
- Increasing access by linking promoted routes and public transport.
- Increasing the health and well-being benefit to excluded groups. Develop innovative ways of engaging and interacting with visitors and residents including those excluded by actual or perceived barriers.
- Developing and maintaining access on Wildlife Trust-owned reserves.
- Increasing the ease of use of the Public Rights of Way network (management plan targets 65% or above easy to use).
- Supporting the development of allotments, where appropriate.
- Exploring opportunities to improve provision of pedestrian paths, rights of way and further circular walking routes to connect existing National and regional trails, sites of interest and settlements via accessible green space. There are potential opportunities for numerous shorter trails to links into existing settlements although provision in the area is already good.
- Providing PRoW improvements and enhancements and ongoing maintenance, including improving or maintaining signage and access, and maintaining or upgrading interpretation as appropriate.
- Improving accessibility, including permissive paths to privately owned woodlands, and to habitats of conservation interest or heritage sites near to PRoW access
- Improving access for horse riding where appropriate, to include bridleways and multi-use paths.

GI Needs & Opportunities for Enhancing Biodiversity & Increasing Ecosystem Resilience

A sustainable approach is critical for supporting the protection of biodiversity and ecosystem resilience. The biodiversity value of the heathlands, grasslands, woodlands and watercourses are of importance to the National Park.

Maintaining and enhancing this network of habitats is important as it is vulnerable to neglect through lack of appropriate maintenance, changes in drainage and land use. This sustainable approach is essential to increase the range and extent of habitats and species and their resilience.

Opportunities for GI to help in addressing biodiversity and ecosystem resilience needs within the Brecon Beacons Uplands GI Zone could include:

- Promoting benefits of high nature value farming.
- Expanding native woodlands and maintain forests, and to practice continuous forestry cover techniques.
- Restoring internationally recognised habitats, and restoring and enhancing habitat connectivity along river valleys.
- Developing monitoring of key habitats, soils and water, and to develop research partnerships.
- Implementing a living landscapes approach to landscape, habitat and wildlife management.
- Prioritising understanding of water and carbon resources management.
- Restoring or enhancing existing assets and habitats, providing management recommendation/support where land is not in public ownership. This should include improving biodiversity value for protected species
- Restoring or enhancing existing assets and habitats providing management recommendations or support where habitats have been degraded.
- Encouraging the diversification of habitats to include the creation, restoration and connectivity of flower-rich habitats to support and sustain pollinating insects.

GI Needs & Opportunities for Strengthening Landscape Character & Distinctiveness

The Brecon Beacons Uplands is a diverse and distinctive landscape, where sweeping uplands contrast with green valleys, dramatic waterfalls, ancient woodland, archaeological sites, caves, forests, reservoirs and vibrant communities. There is a need to conserve and enhance this character.

Opportunities for GI to help in addressing landscape character and distinctiveness needs within the Brecon Beacons Uplands GI Zone could include:

- Researching, conserving and enhancing the historic environment and conserving archaeology.
- Implementing an area-based land management project.

GI Needs & Opportunities for Increasing Climate Change Resilience

The Brecon Beacons Uplands play a significant role in water storage, quality and release, providing a natural defence against both drought and flood. As long as they are free from the effects of heavy grazing, upland peat bogs store carbon and combat atmospheric pollution and illegal fires. They capture atmospheric carbon which helps mitigate the effects of climate change. There is a need to manage the uplands appropriately to sustain these functions.

Opportunities for GI to help in addressing climate change resilience needs within the Brecon Beacons Uplands GI Zone could include:

- Encouraging and supporting community-led initiatives that build awareness of and resilience to climate change, fossil fuel depletion and carbon emissions and assure the well-being of communities in the future.
- Implementing measures to limit further erosion, and reverse the current erosion of peat bog.

GI Needs & Opportunities for Supporting Sustainable Economic Development

The National Park designation should benefit the local economy and local communities in ways that are sustainable and which work to conserve and enhance the Park's special qualities. The need for sensitive land management by and for the local farming community must be a priority, as is the requirement to establish new links and roles with local communities to foster sustainable economic development.

Opportunities for GI to help in addressing sustainable economic development needs within the Brecon Beacons Uplands GI Zone could include:

- Providing public benefits in the countryside through farming, working with farmers to capitalise on the National Park's status and to support them in changes to farm practices.
- Researching and supporting options for local food/produce marketing, and to promote the use of local food to businesses and visitors.
- Identifying on-farm, sustainable energy projects.
- Supporting the local farming community, where possible through agri-environment grants (Glastir or its post-Brexit successor scheme), encouraging flexibility in land management, where appropriate maintaining the existing mixed farming systems, and conserving soils.



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Planning Policy Wales: Green Infrastructure Policy

Extract from Planning Policy Wales: Green Infrastructure Policy

Green Infrastructure Assessments

6.2.6 Planning authorities should adopt a strategic and proactive approach to green infrastructure and biodiversity by producing up to date inventories and maps of existing green infrastructure and ecological assets and networks. Such Green Infrastructure Assessments should use existing datasets, and the best available information, to develop an integrated map-based evidence resource. Doing so will facilitate a proactive approach and enable contributions towards the well-being goals to be maximised.

6.2.7 The Green Infrastructure Assessment should be used to develop a robust approach to enhancing biodiversity, increasing ecological resilience and improving well-being outcomes, and should identify key strategic opportunities where the restoration, maintenance, creation or connection of green features and functions would deliver the most significant benefits.

6.2.8 The outcomes of the Green Infrastructure Assessment should draw from the evidence base provided by Area Statements and well-being assessments and be integrated into development plans to ensure the early and co-ordinated consideration of opportunities to inform the development, design and land related strategies of the plan. The Green Infrastructure Assessment should also be given early consideration in development proposals, and inform the implementation of projects.

6.2.9 Considering how significant benefits can be delivered through green infrastructure will be a key aim of the assessment. This may involve identifying opportunities to improve water management and flood mitigation through the provision of Sustainable Drainage Systems, including design measures such as green roofs. In a similar way, identifying how the provision of green

infrastructure could form an integral part of strategies for growth will be an important factor in maintaining good air quality and appropriate soundscapes.

6.2.10 The need for ecosystems, habitats and species to adapt to climate change should be considered as part of the Green Infrastructure Assessment. This should include identifying ways to minimise or reverse the fragmentation of habitats, and to improve habitat connectivity through the promotion of wildlife corridors and identifying opportunities for land rehabilitation, landscape management and the creation of new or improved habitats. Planning authorities should ensure that development minimises impact and provides opportunities for enhancement within areas identified as important for the ability of species to adapt and/or to move to more suitable habitats.

6.2.11 Planning authorities must encourage the appropriate management of features of the landscape which are of major importance for wild flora and fauna in order to complement and improve the ecological coherence of the Natura 2000 network¹. The features concerned are those which, because of their linear and continuous structure or their function as 'stepping stones' or 'wildlife corridors', are essential for migration, dispersal or genetic exchange. The development of networks of statutory and non-statutory sites and of the landscape features which provide links from one habitat to another can make an important contribution to ecosystem resilience and the maintenance and enhancement of biodiversity and the quality of the local environment, including enabling adaptation to climate change.

¹ Section 41 of The Conservation of Habitats and Species Regulations 2017
<https://www.legislation.gov.uk/uksi/2017/1012/contents/made>

6.2.12 Green Infrastructure Assessments should be regularly reviewed to ensure that information on habitats, species and other green features and resources is kept up-to-date, so that development management decisions are informed by appropriate information about the potential effects of development on biodiversity and green infrastructure functions. Where information is submitted as part of a development proposal (for example, a green infrastructure statement) it should consider the Green Infrastructure Assessment. Planning authorities should use the best available data to monitor a set of key species and habitats, and incorporate these indicators into both their Annual Monitoring Reports (AMRs) and, where appropriate, into the appropriate Section 6 Plan and Report. The monitoring of success and delivery of habitat and species mitigation requirements secured through conditions and obligations can also usefully feed into this process. At the end of each reporting period they should use this data to indicate whether there has been a net gain or loss of biodiversity, and should use the trends identified to determine future priorities for planning and decision making, with the aim of furthering the goals of the Section 6 Duty.



Monmouthshire Wellbeing Plan Extract - Objective 3

SIR FYNWY

MONMOUTHSHIRE



Monmouthshire Public Service Board Well-being Plan



Well-being Objective - Protect and enhance the resilience of our natural environment whilst mitigating and adapting to the impact of climate change

Discover - Situation analysis

The Well-being Assessment highlighted the key challenges and issues for Monmouthshire, those that are directly impacted by this objectives are:

- Limited public transport, particularly in rural areas, makes it harder for people to access jobs, services and facilities. This could be exacerbated by rising fuel prices but there are also future opportunities for investment in public transport through the City Deal and advances in technology such as automated vehicles.
- Air pollution causes significant problems for people's health and is a major contributor to premature deaths in Wales. In Monmouthshire, the greatest problems are caused by vehicle emissions and this is particularly apparent in Usk and Chepstow.
- Water pollution is a concern, from a number of sources, including changing agricultural practices
- Reducing levels of physical activity along with dietary changes are leading to growing levels of obesity. This is likely to lead to an increase in long-term conditions associated with it such as type 2 diabetes
- Development, climate change and pollution all present risks to the natural and built environment. These are central to our well-being and need to be protected and preserved for future generations.
- Climate change is likely to increase the risk of flooding, as well as many other risks, so mitigating climate change and building resilience will be crucial for communities

Define - Response analysis

Natural resources, such as air, land, water, wildlife, plants and soil, provide our most basic needs, including food, energy and security. Our ecosystems need to be in good condition and resilient in order to keep us healthy, contribute to the physical and psychological well-being and provide vital contributions to the economy through tourism, agriculture, forestry and more. Because these natural resources are key to so many aspects of well-being, they can't be considered in isolation.

The challenges facing our natural environment are many – climate change, development and changing land management practices are all potential threats to our natural resources and ecosystems. This has resulted in a consequent decline in biodiversity which is a threat to how ecosystems function. Tackling these challenges demands integrated and joined up solutions which are developed and delivered by the public, private and voluntary sectors working together. We need to look at adapting to climate change and well as reducing our contribution to it. The Environment (Wales) Act, with subsequent area plans, works alongside the Well-being of Future Generations Act to address these issues.

The public sector in Wales has huge potential to use its collective purchasing power to support the local economy by specifying and buying food, energy, goods and services locally. Procurement can also have significant global impacts and thought needs to be given to being globally responsible. With Brexit on the horizon, there may be potential for public services to have more flexibility in their purchasing decisions, creating regional jobs and business growth

whilst reducing transport and pollution. Brexit also adds uncertainty for a number of sectors, including agriculture which is an important sector in Monmouthshire.

Monmouthshire has great potential to generate renewable energy locally. Several renewable energy community interest companies already exist in the county and developing more localised business models for renewable energy and heat generation, storage and distribution will increase energy resilience as well as reducing carbon emissions.

In order for air pollution to be within safe limits for all Monmouthshire residents, transport sources have the potential to be addressed by developing the infrastructure needed for alternative vehicle use, such as electric vehicle charging, which during 2017 has just started being developed in Monmouthshire, and the forthcoming trial in the county of the Rasa hydrogen-powered vehicle. Alongside this, developing public transport solutions is essential to address rural isolation and access to jobs and services.

Promoting active travel (walking and cycling) in both rural and urban areas, and using opportunities offered by the Active Travel Act will help to reduce air pollution but will also have significant health benefits for all ages. Careful planning and design, including using a Green Infrastructure approach, is needed to develop safe, healthy and vibrant communities which have good access to safe and accessible routes and green spaces.

In order to build species and ecosystem resilience in the face of the likely trend of hotter, drier summers and warmer, wetter winters, or other pressures on our natural environment, landscape-scale biodiversity action is needed. Habitats need to be well connected in order to be resilient. Successful partnerships already exist, such as the Wye and Usk Foundation and the Living Levels project, and these partnerships need to be supported and replicated. Acting at a landscape scale also has the potential to provide significant natural flood risk management, and reducing the risk of flooding has economic, social and health benefits.

In all of these areas, working with young people who will be the decision makers of the future is essential. Through schools, youth work and community groups, young people need to understand what sustainable development is, know why it is important, be inspired to make a difference and empowered to become innovative, creative, caring citizens of the future.

Well-being goals contributed to

Prosperous Wales (1)	Resilient Wales (2)	Healthier Wales (3)	More equal Wales (4)	Wales of cohesive communities (5)	Vibrant culture & thriving Welsh language (6)	Globally responsible Wales (7)
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As well as being key to environmental well-being, a Resilient environment is essential to the local economy, to physical and mental health and building Cohesive Communities. To be Globally Responsible, we need to work together to reduce the carbon and pollution we emit by tackling sustainable transport and our energy use and generation. Key to this objective is working with children and young people to help them understand their role in looking after our environment, reducing our environmental impact and recognising the importance of “thinking globally and acting locally”.

Delivering the Solution

The PSB will focus on:	Objective links	Goals	Impact
Improving the resilience of ecosystems by working at a larger scale (landscape) to manage biodiversity and maximise benefits such as natural flood risk management		1, 2, 3	Long
Ensuring design and planning policy supports strong, vibrant and healthy communities that are good for people and the environment.		1, 2, 3, 5, 7	Long
Enabling renewable energy schemes, especially community-owned schemes, and developing new solutions including storage, smart energy, heat and local supply.		1, 5, 7	Short
Enabling active travel and sustainable transport to improve air quality and give other health benefits.		1, 5, 6, 7	Med
Working with children and young people to improve their awareness, understanding and action for sustainable development and make them responsible global citizens of the future.		1, 2, 3, 4, 5, 6, 7	Long



Sources of Advice

Sources of Advice

Monmouthshire County Council Development Management Department

County Hall, Rhadyr,
Usk, NP15 1GA
01633 644831
planning@monmouthshire.gov.uk

Monmouthshire County Council GI & Countryside Department

County Hall, Rhadyr,
Usk, NP15 1GA
01633 644850
countryside@monmouthshire.gov.uk
rightsofway@monmouthshire.gov.uk
greenInfrastructure@monmouthshire.gov.uk

Monmouthshire County Council Highways Department

County Hall, Rhadyr,
Usk, NP15 1GA
01633 644644
highways@monmouthshire.gov.uk

Brecon Beacons National Park Authority

Plas y Ffynnon, Cambrian Way Brecon,
Powys, LD3 7HP
01874 624437
strategy@beacons-npa.gov.uk
Management Plan (2010-15) available from: <http://www.beacons-npa.gov.uk>

Wye Valley Area of Outstanding Natural Beauty Unit

Hadnock Road,
Monmouth, NP25 3NG
01600 713977
aonb.officer@wyevalleyaonb.org.uk
Management Plan (2009-14) available from: <http://www.wyevalleyaonb.org.uk>

Natural Resources Wales

Ty Cambria, 29 Newport Road,
Cardiff, CF24 0TP
0300 065 3000
enquiries@naturalresourceswales.gov.uk

Cadw

Welsh Government, Plas Carew, Unit 5/7 Cefn Coed, Parc Nantgarw,
Cardiff, CF15 7QQ
01443 336000
cadw@wales.gsi.gov.uk

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Biodiversity & Ecosystem Resilience Forward Plan Objectives

Monmouthshire Biodiversity & Ecosystem Resilience Forward Plan Objectives

- 1. Embed biodiversity throughout decision making at all levels** - High level decision making such as policy and plan adoption and future spatial planning including the development plan process are key areas where embedding biodiversity will be vital to meet the Section 6 duty. Objective 1 will particularly apply to all types of consents that Monmouthshire County Council issues including planning permission and other consents that may not currently consider biodiversity. It will also apply to decisions taken in relation to procurement, contracts, licences, asset management and wider land management policies such as road verge management. The objective will be achieved by embedding biodiversity and resilience of ecosystems into business planning by service area. This will require service areas to understand what potential impacts work streams can have on biodiversity and development of a programme of delivery. Internal awareness raising and training will have an important role in meeting the objective.
- 2. Provide environmental education to raise awareness and encourage action** - An improved understanding and awareness of biodiversity and ecosystems leads to behavioural change and encourages everyone to act. Environmental education has developed over several decades and it is now threatened by funding cuts however, to make real progress towards better understanding and appreciation of the value of biodiversity and ecosystems, it is vital to maintain actions to meet this objective. Environmental education provision by Monmouthshire County Council as the Local Education Authority and through service areas such as Countryside & Green Infrastructure, Waste & Recycling, Outdoor Education, Monmouthshire Youth Service and the role of the Rural Development Programme can deliver this objective which will require sufficient resource to be put in place. Alignment with the work of external partners will be vital and the use of networks such as the Outdoor Learning Wales: Monmouthshire Cluster Group can facilitate this. Key external partners include Keep Wales Tidy, Gwent Wildlife Trust, Welsh Water, Wye Valley Area of Outstanding Natural Beauty Unit, Brecon Beacons National Park Authority, RSPB and others. Volunteers, including those at Monmouthshire County Council, also provide vital support in this delivery. There are opportunities to engage staff at Monmouthshire County Council with the use of resources such as the Incredible Edible pollinator garden at County Hall Usk and Caldicot Castle Country Park. The connection between benefits to the environment and well-being benefits of people is an important target area for many partner organisations. As well as encouraging action, this work shall contribute to the physical and mental health and wellbeing of those involved.
- 3. Undertake land management for biodiversity and promote ecosystem resilience** - The rationale for land management methods by Monmouthshire County Council shall be reviewed to identify opportunities to improve sites for Biodiversity so long as is consistent with commitments under other legislation such as those relating to Health and Safety and Heritage. A Green Infrastructure approach to this management shall ensure multiple benefits for communities. Changes shall be made with the aim of restoring habitats to a natural and resilient state and in particular to safeguard Section 7 habitats and species. To achieve this objective Monmouthshire County Council will need to have a better understanding of where and how we influence these habitats and species. Conservation management skills, machinery and processes may need to be developed to enable a shift from a 'neat and tidy' rationale to a management of habitats approach. Reviewing pesticide use and other practices will deliver more benefits. Working in partnership with other organisations and volunteers such as Keep Wales Tidy and Friend's Groups will increase the specialist expertise available and establish 'buy-in' of local communities. Tools such as the Green Infrastructure Action Plan for Pollinators in South Wales can provide framework for delivery. Monmouthshire County Council has a close connection to the Bee Friendly Initiative is working to achieve a Bee Friendly status which shall aid in meeting this objective. Monmouthshire County Council shall seek to enhance the capacity of natural resources on sites it owns to provide essential ecosystem services such as water management, climate regulation and crop pollination as well as enhancing the environment.
- 4. Influence land management to improve ecosystem resilience** - Positively influencing management undertaken by others can increase the impact Monmouthshire County Council has on improving ecosystem resilience across the region and beyond. Continuing to work with external partners and supporting landscape scale projects such as Living Levels, Wye Catchment Partnership and the Long Forest project can increase the scale of the impact. Development Management shall continue to deliver this through promoting a Green Infrastructure approach to design, development and subsequent management of sites. The Rural Development Programme shall do this through projects such as those promoting action for pollinating insects. There is also scope for land owned by Monmouthshire County Council which is subject to tenancies and licences to be influenced by using clauses and conditions which will reduce negative impacts and promote positive actions e.g. protecting high value sites, tree planting or hedgerow management. There are opportunities to play an important role in tackling climate change and its negative effects. Monmouthshire County Council shall continue to be an exemplar of best practice for management and encourage other Public Authorities to make changes.

5. **Tackle key pressures on species and habitats** - Pollution, invasive non-native species (INNS), and inappropriate land management are pressures on species and habitats that need to be tackled. Monmouthshire County Council has statutory duties relating to pollution and INNS under other relevant legislation however, by working in partnerships with other organisations for example Living Levels and Wye Catchment Partnership, Keep Wales Tidy and The Deer Initiative, more significant impacts can be achieved. By adopting a Green Infrastructure approach to site management and in using nature based solutions to make improvements e.g. to improve water quality, we can take steps towards achieving the objective. A Green Infrastructure approach to development management can reduce the impacts of development on biodiversity and conserve, integrate and improve ecosystem services to deliver multifunctional benefits.
6. **Support landscape scale projects and partnerships to maximise delivery** - Monmouthshire County Council's continued role in supporting and contributing to landscape scale projects is important to maximise delivery for biodiversity and ecosystems. Key projects for Monmouthshire County Council will be Living Levels, Wye Valley Catchment Partnership and any forthcoming Sustainable Management Schemes or HLF projects where Monmouthshire County Council has a remit particularly in the National Park and Wye Valley AONB. These projects often require cross-boundary working to take place with neighbouring authorities and organisations. The role of the Environment Partnership Board in steering this work shall continue to bring together key organisations and provide direction for the Local Authority in delivery of the Environment (Wales) Act 2016 and Well-being of Future Generations Act 2015. As identified through consultation with external partners, there is a need for a Local Nature Partnership on a Monmouthshire level to provide an information sharing network and identify opportunities for collaborative works with partners, community groups and volunteers.
7. **Monitor the effectiveness of the plan and review** - Action carried out by Monmouthshire County Council shall be monitored to establish its effectiveness. Individual service areas shall undertake monitoring. Partnership working including working with volunteers will be vital to establish the effectiveness of action such as the Rural Development Programme. It is a requirement that the plan is reported on to Welsh Government in 2019 and every three years subsequently. Monmouthshire County Council commits to this and to learning from the results of monitoring. The forward plan and service area action plans shall be reviewed accordingly.

Monmouthshire Biodiversity and Ecosystem Resilience Forward Plan (MCC, March 2017)

Prepared by



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